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Systemic explanations of psychological symptoms and distress in clinical and research practice

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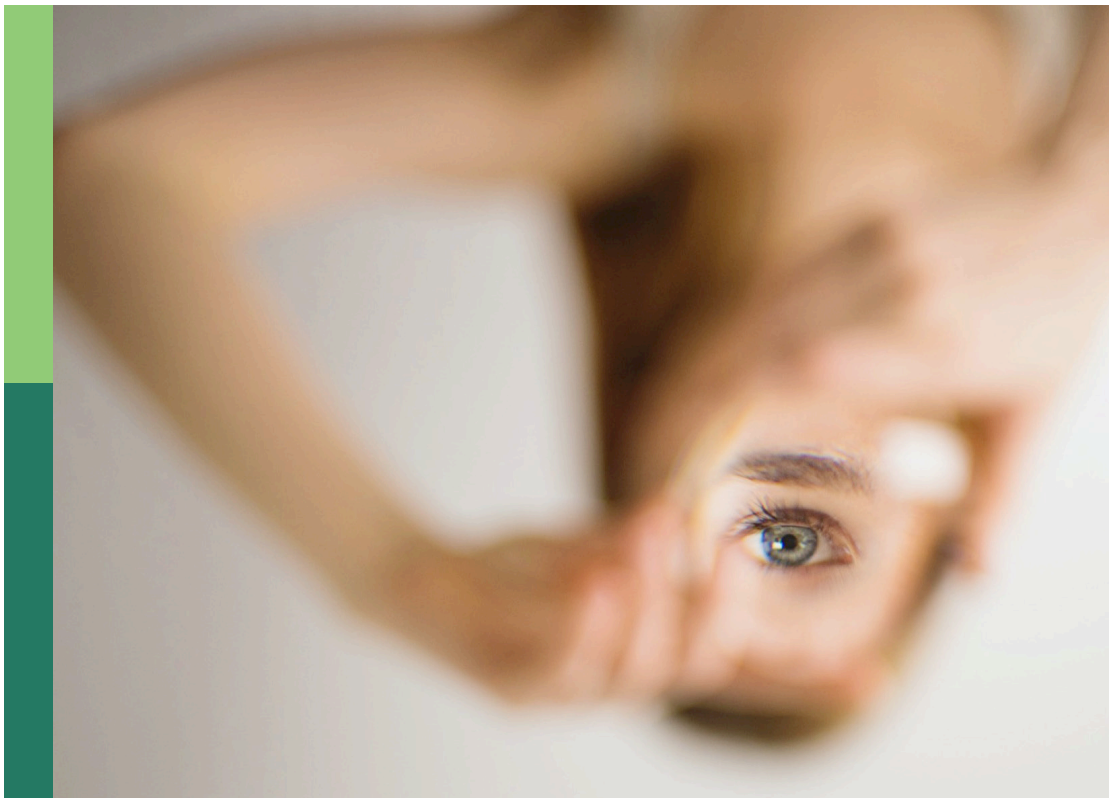

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Systemic explanations of psychological symptoms and distress in clinical and research practice

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Editorial: Systemic explanations of psychological symptoms in clinical and research practice

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Editorial on the Research Topic
Systemic explanations of psychological symptoms in clinical and research practice

Socio-constructionist systemic models envisage all behaviors, including symptoms, as complex and meaningful relational processes, shaped by multiple intertwined factors that are not confined within the individual and that cannot be reduced to single dimensions, nor be de-contextualized. They hence share an interpersonal and non-pathologising perspective on problems and their possible solutions, drawing on the fundamental interconnectedness of the human condition: people's lives are inextricably intertwined, and their behavior is, to a great extent, a function of the way they interact with one another.

Over the last few decades, systemic thinking has gained increasing recognition in several scientific fields for its non-reductionist, complexity-based perspectives. This Research Topic presents a diverse and international array of contributions that collectively underscore the ongoing relevance and potential of systemic approaches in understanding and deconstructing psychological symptoms. The featured articles challenge the labeling and individualistic tendencies that have long dominated mainstream psychiatry and clinical psychology, advocating instead for models that recognize the complexity, and interconnectedness inherent in mental health "disorders" offering innovative perspectives for both conceptualizing and addressing them.

Challenging traditional explanatory models

Constant et al. overcome the disciplinary boundaries within evolutionary, cultural, and computational psychiatry, arguing that these siloed approaches limit our understanding of mental disorders. They put forward the *Evolutionary, Cultural, and Computational (ECC)*

model, which seeks to integrate the three approaches by adopting a multilevel systemic perspective. To illustrate how the ECC model could provide a more comprehensive understanding of mental disorders -by accounting for both the biological and cultural dimensions and modeling their interaction computationally- they apply it to Major Depressive Disorder (MDD).

Gómez-Carrillo and Kirmayer too emphasize the importance of systemic and contextual factors in shaping mental health. They complement Constant et al.'s perspective by critiquing the reductionist tendencies within contemporary psychiatry, which often focus narrowly on neurobiological mechanisms. They explore the limitations of models constructing mental health and cognitive processes through isolated, linear causal chains. Embracing systemic thinking, they advocate for an *ecosocial systems view*, and emphasize that psychological phenomena should be understood as dynamic systems, intricately shaped by the ongoing interactions and feedback loops between individuals and their socio-cultural contexts.

Gallagher adopts an enactive approach to address the integration problem in psychiatry. Arguing against the conventional use of hierarchical levels to explain the diverse processes involved in psychiatric disorders, Gallagher propose a model based on dynamical causality and a non-hierarchicalconcept of gestalt, where processes are understood as dynamically integrated rather than operating at different levels. By applying this model to Autism Spectrum Disorder (ASD) he provides a compelling case study, demonstrating how a level free, dynamical approach can offer a holistic and accurate understanding of disorders.

Similarly, García and Arandia gain insights from enactive cognitive science integrating concepts from Gilbert Simondon's philosophy of individuation to propose a relational model of causality in psychiatry. They emphasize that mental disorders arise from the complex interplay of tensions across multiple domains—i.e., organic, sensorimotor, and social: disruptions in the sensemaking process, where individuals generate meaning through their interactions with the environment, are central to understand mental disorders. They also emphasize *transindividuality*, highlighting the role of social relations. Finally, they too advocate for therapeutic interventions that address these dynamic, interconnected processes rather than targeting isolated causes.

Rucińska and Fondelli introduce an enactive framework informed by a systemic approach for understanding how therapeutic change can be facilitated through metaphorical thinking. They conceptualize metaphors as embodied, enacted, or ecological processes, extending them beyond traditional linguistic interpretations: metaphors gain their therapeutic power through dynamic engagement and action within dialogue, rather than through static comparison or intellectual insight. By drawing on enactive cognitive science, which sees language as an embodied, interactive process, they thus offer a non-reductionist explanatory account: the therapeutic power of metaphors lies in their ability to be enacted and co-constructed in interaction, leading to transformative experiences for the client.

The persistence of reductionism and the need for systemic re-thinking in psychiatry and mental health

While systemic approaches are gaining traction, the study conducted by Fellin et al. highlights the persistent dominance of bio-reductionist views in mainstream psychiatry. The Authors argue that the prevailing but debunked biomedical model, with its exclusive focus on nosographic classification and unsubstantiated or discarded pathophysiological hypotheses, remains overly reductionist: it neglects the complex, relational, and systemic factors at the core of psychopathology. They exemplify it by analyzing how mood disorders are constructed in mainstream psychopathology textbooks: aetiological explanations are still predominantly monadic and intrapersonal (biological), with minimal attention given to systemic and interpersonal aspects. This shows that mainstream psychopathology remains largely "resistant" to systemic thinking, continuing to prioritize the biomedical model, despite its limitations have been largely exposed.

Thoma et al. also challenge these individualistic tendencies by comparing systemic contributions with those of the German phenomenological psychiatrist Wolfgang Blankenburg, particularly his concept of the "loss of common sense" in schizophrenia. Blankenburg's approach is noted for its integration of social and familial contexts, moving beyond the individualistic focus of earlier phenomenological psychiatry: his seminal research on families of young people with schizophrenia had already identified specific structures hindering the individual's social integration and emancipation. Much of Blankenburg's work was a precursor to contemporary systemic approaches, which view mental disorders as arising from the interplay between individual, socio-relational, and cultural factors. By contrasting these two approaches, the Authors also emphasize their differences and the importance of teleological explanations, focusing on the reasons and motivations behind symptoms, rather than purely etiological causes, in accordance with previous systemic research (Ugazio et al., 2020, Fellin et al.).

The role of social networks in explanatory and therapeutic models

The importance of social networks in the treatment and explanation of mental disorders is another central theme, particularly highlighted in the inspiring studies by Braus et al. and Hunger-Schoppe et al.. Both emphasize the complex dynamics within social networks and their impact on mental health, focusing specifically on Alcohol Use Disorders (AUD) and Social Anxiety Disorder (SAD).

Braus et al.'s cross-sectional study explores the relational factors contributing to the etiology, maintenance, and recovery from AUD. They introduce the concepts of Support Social Networks (SSN) and Craving Social Networks (CSN) to distinguish between the types of social interactions that either support recovery or exacerbate craving. Their findings reveal that individuals in full remission from AUD tend to have smaller, less negative craving networks compared to those who are not, while maintaining robust support

networks. Their innovative work also highlights the ambivalence within these networks, where craving-associated relationships can provide some degree of social support, complicating the recovery process. This underscores the dual roles social relationships play in both sustaining and recovering from addiction. Hunger-Schoppe et al. emphasize the critical role of social networks in the treatment of mental disorders, particularly SAD, as they are deeply embedded in broader social networks, not isolated within individuals. The Authors introduce an Integrative Systemic and Family Therapy (ISFT) approach, which emphasizes involving various social system members—including family, friends, and colleagues—in the therapeutic process. This systemic framework recognizes that mental disorders are deeply embedded in broader social networks, not isolated within individuals. Their randomized controlled trial (RCT) demonstrates that ISFT led to significant improvements in both social anxiety symptoms and overall social functioning compared to Cognitive Behavioral Therapy (CBT). These important results highlight how mental disorders can heal within a more holistic and hence effective approach to therapy.

Both articles collectively argue for the need to incorporate a nuanced understanding of social networks into explanatory models and treatment approaches, particularly in systemic therapy, to enhance the effectiveness of interventions.

Conclusion

All these innovative international contributions emphasize how different disciplinary traditions are now embracing a more systemic and contextual approach viewing mental distress as an understandable reaction to wider relational and societal problems, rather than situated solely "within the sufferer and their brain". They challenge traditional individualistic and reductionist models that can often lead to misunderstanding and mistreating psychopathology and they advocate instead for more relational and contextual approaches. Different research demonstrate how mental health can be better understood and addressed when viewed through systemic lenses: they highlight the critical role of social networks, cultural contexts, and systemic integration in both the explanation and treatment of psychological symptoms and disorders. They also underscore the importance of continuing the interdisciplinary dialogue and cross-contamination that has historically enriched systemic therapy, demonstrating how integrating insights and empirical evidence across disciplines can significantly enhance our understanding and treatment of "mental disorders". By drawing also from fields such as cognitive sciences, developmental psychology, and transcultural psychiatry, adopting a systemic framework can not only enhance our clinical practice, but also foster more empowering narratives for patients, helping to alleviate feelings of blame, guilt, and shame often associated with reductive explanations. This Research Topic thus serves as a compelling example of how interdisciplinary efforts can drive progress in these fields.

As systemic thinking continues to evolve, it holds the promise of further enhancing both research and clinical practice. This Research Topic emphasizes the enduring value of systemic approaches in psychiatry and psychology and encourages ongoing exploration and integration of these perspectives to foster more comprehensive and effective mental health care. This is in accordance with the recent UN (Pūras, 2017) and World Health Organization (2021) recognitions of a need for radical transformation of the mental health paradigm and service landscape, to better recognize and respond to the holistic needs of people who use -but are often chronicized by those very- services. Embracing a systemic perspective may pave the way for a unique opportunity toredevelop mental health services for children and adults in a way that can heal them, rather than further pathologise and disempower them.

Author contributions

LF: Conceptualization, Writing – original draft, Writing – review & editing. HD: Writing – review & editing. MF: Writing – review & editing. ER: Writing – review & editing. LG: Writing – original draft, Writing – review & editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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BRIEF RESEARCH REPORT
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The Complex Dynamics of Resources and Maintaining Factors in Social Networks for Alcohol-Use Disorders: A Cross-Sectional Study

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Systemic therapy considers the complex dynamics of relational factors and resources contributing to psychological symptoms. Negative maintaining factors have been well researched for people suffering from Alcohol-use Disorders (AUD). However, we know little about the complex dynamics of these negative factors and resources. We interviewed fifty-five participants suffering or fully remitted from Alcohol-use disorders in this cross-sectional study (M = 52 years; 33% female). The interviews focused on relational factors (e.g., social support and social negativity) referring to a Support Social Network and a Craving Social Network (CSN). The CSN included all significant others who were associated with craving situations. We compared the network characteristics of the group suffering from Alcohol-use Disorders (n = 38) to a fully remitted control group (n = 17). The abstinent group with full remission named on average fewer individuals in the CSNs. They had lower social negativity mean scores in the Support Social Network compared to the non-remitted group (d = 0.74). In the CSN, the mean scores of social support were significantly higher than the median for both groups (d = 2.50). These findings reveal the complex interplay of relational patterns contributing to the etiology, maintenance, and recovery from Alcohol-use disorders. A successful recovery can be linked to increased social resources and reduced relations associated with craving. However, craving-associated relations represent an important source of social support. Future research should investigate this ambivalence for the systemic perspective on the explanation and treatment of Alcohol-use disorders.

Keywords: social network, alcohol use disorder, social support, social negativity, craving, Social Network Interview, systemic therapy

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INTRODUCTION

Systemic therapy is a widespread evidence-based psychotherapy approach. According to the systemic perspective, mental disorders are understood within the context of social systems or networks (von Sydow et al., 2010). Therefore, significant others are included directly or virtually in the therapy (e.g., systems-oriented questioning and genogram work) (Becvar and Becvar, 2009).

Abbreviations: AUD, alcohol use disorder; ICD, International Classification of Diseases; SocNet, Social Network Interview; SSN, Support Social Network; CSN, Craving Social Network; H1, Hypothesis 1; RQ, Research Question.

Apart from this theoretical view, recent empirical studies investigating psychological health in general (Hartmann et al., 2010) showed that an integration of significant others within therapy is beneficial for both the client and the significant others. Therefore, research on the development of diagnostic instruments assessing social networks has been stimulated. Complex measures show more predictive validity in assessing social networks than simple measures do (Holt-Lunstad et al., 2010, 2015). Related research to Alcohol-use disorders (AUD; Litt et al., 2016) asserts that larger, integrated social networks can be more easily activated to protect individuals from drinking than disjointed social networks (Perry and Pescosolido, 2012; Pescosolido, 2015).

Systemic therapy historically focused on family systems (von Sydow et al., 2010). The modern approach of open dialogue also draws on systemic theory. It exceeds the historical focus on family systems highlighting the role of social networks including extra-familial and professional relations (Breunlin et al., 2011; Heatherington et al., 2015). Therefore, this approach uses network meetings as a central intervention (Seikkula et al., 2001; Razzaque and Stockmann, 2016; von Peter et al., 2019). However, due to a variety of other specificities, open dialogue is not considered as a systemic approach. Yet, it highlights the importance of including social networks around an individual in psychotherapy based on a systemic theory. Likewise, the important role of social networks for recovery has also been recognized in the research field of alcohol and drug use disorders (Mericle, 2014; Stone et al., 2016). Most studies use the Important People Interview (IPI) (Zywiak et al., 2009) to assess social network characteristics. The IPI and other validated methods of social network instruments have discovered central variables to predict important alcohol use disorder-specific outcomes (Homish and Leonard, 2008; Longabaugh et al., 2010; Majer et al., 2015). A growing body of research (Goehl et al., 1993; Howard, 2006; Young and Timko, 2015) highlights the interpersonal dilemmas associated to positive social drifts in course of recovery. Identifying and supporting individuals in retaining and abandoning certain network members seem to be essential to treatment success (Goehl et al., 1993; Stone et al., 2014; Young and Timko, 2015). In her review on social networks with AUD, Mericle (2014) demands more future research discovering the complex dynamics within social networks in order to develop specific network treatments and strategies. With regard to the development of therapeutic practice, Mericle (2014) demands more knowledge on temporal processes, resources and barriers that help therapists understand how to support individuals facing social drifts during the recovery process.

In the course of an intervention study on systemic therapy for social anxiety (Hunger et al., 2020), a new social network instrument was developed. The so-called Social Network interview (SocNet) aimed for assessing the complex interpersonal processes during treatment. The SocNet is a semi-structured instrument based on hierarchical mapping technique by Antonucci (1986). It integrates both qualitative as well as structural social network characteristics in line with the recommendation by Mericle (2014). The study at hand transfers the SocNet to the context of AUD. However, one could question the need for a more complex instrument given the valid and simple IPI. We on the other hand believe that the SocNet instrument could inspire and support future intervention studies considering the complexities of real-life social networks. The MATCH-project (Longabaugh et al., 2010) represents an example for the development of treatment approaches based on findings on social networks. The authors discovered the importance of network structure and support for treatment success. Litt et al., 2016 then utilized the findings of the MATCH-project to develop an individually delivered social network intervention. This treatment supports individuals suffering from AUD to alternate their social networks according to findings from the MATCH-project. In the study on systemic therapy (Hunger et al., 2020), the SocNet has shown to support therapists in integrating relevant social network members into therapy. We believe that the SocNet could also inspire novel network interventions that are not individually delivered but are delivered in a similar way to the network meetings of open dialogue (Seikkula et al., 2001).

In the SocNet (Hunger et al., 2019) a resource-oriented support social network (SSN) was added to the assessment of a problem-orientated social network. This additional perspective exceeds the IPI. The resource-oriented support network encompasses all important others who support the participant to deal with everyday life. In order to transfer the problem-orientated social network to the context of this study, it now refers to a craving social network (CSN). The CSN encompasses all important others who are associated to or are a trigger to craving. According to the DSM, craving is "a strong desire or urge to use alcohol" (American Psychiatric Association, 2013). Alcohol craving is a central variable in the theoretical models regarding the etiology, maintenance and recovery of AUD (Schlauch et al., 2019). More recent models and findings based on social learning theory have stressed the importance of social situations and cues in the context of craving (Marlatt, 1996; Drummond et al., 2000).

In order to receive even more insights into the dilemmatic dynamics, social support encompasses both positive social support and social negativity. Several studies revealed that these qualitative network characteristics have more predictive power for the recovery of AUD (Longabaugh et al., 2010; Mericle, 2014) than structural aspects of social networks. This concept of social support is based on social exchange theory (Cook et al., 2013) differentiating between positive and negative socio-emotional exchanges. Positive social support describes positive socio-emotional exchanges (e.g., acceptance, altruistic behavior) (Bertera, 2005). Social negativity describes a negative form of socio-emotional exchange (e.g., lack of empathy and acceptance or debasement) or can encompass the subjective conflicting aspect of a relationship (Bertera, 2005). In this study we assume that both forms of social support are present within the same social network (i.e., within the SSN and CSN). Moreover, including social negativity was not only based on theoretical concerns but evidence-based: While findings on positive social support in the prediction of patients' health are inconsistent (Stone et al., 2016), a growing body of research confirms the predictive advantage of social negativity for patients' health outcomes (Schuster et al., 1990). Although positive social support

seems to be relevant for the recovery of AUD, social support showed less predictive power for alcohol-related outcomes than social negativity (Beattie and Longabaugh, 1999). Various findings of longitudinal studies (Kelly et al., 2011; McCutcheon et al., 2014; Brown et al., 2015) indicate patterns of social drifts of successfully recovered persons with AUD: Successfully recovered patients report that the number of network members associated to drinking decreases and the amount of positive social support increases.

HYPOTHESES AND RESEARCH QUESTION

Differences Between Craving- and Support Social Networks

Hypothesis 1a We assume that the degree of positive social support within the support social network is significantly higher compared to the CSN. We also assume that the degree of social negativity within the CSN is significantly higher compared to the support social network.

Hypothesis 1b We assume that the degree of social negativity in social support networks is significantly higher than the minimum of the scale. We also assume that the degree of positive social support in craving support networks is significantly higher than the minimum of the scale.

Research Question 1: What are the differences between craving- and support social networks concerning other structural aspects?

Differences Between Remitted vs. Non-remitted Participants

Hypothesis 2 We assume that the individuals recovered from AUD name more people within support social networks and fewer within craving networks. We assume that the persons recovered from AUD experience more positive social support and experience less social negativity in both networks.

Research Question 2: What differences can be found concerning other characteristics within the craving- and support social networks (CSN, SSN) between persons recovered from AUD and suffering from AUD?

METHODS

Design

This study is a monocentric cross-sectional pilot trial. The sample consists of patients who currently suffer or have suffered from an alcohol use disorder in terms of dependency (F10.2) or abuse (F10.1) (Dilling et al., 2014). The Ethics Committee of the Medical Faculty of Heidelberg University (S-524/2018) approved the project.

Participants

Participants had to fulfill the following inclusion criteria: (1) age > 18 years; (2) diagnosis of an alcohol use disorder in terms of dependency or abuse (ICD-10: F10.1, F10.2); (3) informed consent. Comorbid disorders were allowed as long as the AUD was of primary concern. Interested persons with the following criteria were excluded: (1) Diseases accompanied with a severe impairment of neurological or cognitive functioning; (2) acute intoxication at the time of the interview; (3) eating disorder (BMI < 14); (4) acute psychotic disorder (F23.x); (5) insufficient German language skills. Recruitment was performed by distributing flyers and study information to physicians, psychologists, psychotherapists, occupational therapists, hospitals and psychosocial counseling centers in and around Heidelberg, public announcements in the local press, on the website of the Institute for Medical Psychology at the University Hospital Heidelberg, and Facebook. All participants presented themselves and none were referred.

Procedure

In order to participate, each interested person had to participate in a screening interview addressing the persons' drinking behavior (SCID, section E for alcohol use disorder; Wittchen et al., 1995), additional psychological and medical problems, previous and current psychotherapy and/or pharmacotherapy, self-harm as well as the tendency to injure others, and suicidality. Either the persons' general practitioner or one of the psychologists from our study team performed the semi-structural screening interview. If the person met the inclusion criteria, she or he was invited to the SocNet. Prior to this, the person was asked to fill out a questionnaire with standardized scales on drinking behavior and mental health.

The SocNet started with the support social network followed by the CSN. After having finished the SocNet, the participants received a photo from their support and CSN if desired. All participants were invited to call the interviewer and/or the study team in case of any discomfort subsequent to the interview session.

Material

The Social Network Interview

The SocNet is a semi-structured interview, assessing two types of social networks: support social networks (SSN) and CSN. SSN include (groups of) individuals which support a person to cope with everyday life situations in a confident and secure manner. Participants are shown a diagram depicting three concentric circles (**Supplementary Material 1**). The center of the smallest circle displays the word "I." Participants were asked to think about (groups of) people of whom they perceived very much (circle 1), some (circle 2), or a bit social support (circle 3). There was an additional category of (groups of) people who showed no social support though they wished to be supported by them (circle 4). Participants were asked to place wooden blocks into the circles representing the (groups of) individuals based on how much the participants felt supported by them. Participants were then asked detailed questions about the (groups of) individuals.

For individuals, questions included age of each person, kind and duration of the relationship, and frequency of contact. For groups of individuals, patients estimated mean age and range of age, the number of individuals constituting the group, duration of the relationship, and frequency of contact to the group, in addition to the description of the kind of relationship with this group. Considering the three (groups of) most important individuals within the social network, questions also referred to perceived positive social support and social negativity.

CSN include (groups of) individuals who stimulated craving and/or represented situations in which the participants experienced craving when coping with everyday life situations. We adapted the above described SSN depicting three concentric circles while, again, the center of the smallest circle displayed the word "I" (**Supplementary Material 1**). Participants were asked to think about (groups of) people who stimulated no craving (circle 1), some (circle 2) or much craving (circle 3), or no craving though supposed to stimulate it (circle 4), and to place wooden blocks into the circles representing the (groups of) individuals based on how much they caused craving perceived by the participants. Participants were then asked detailed questions about the (groups of) individuals including age of each person, kind and duration of the relationship, and frequency of contact. Considering the three (groups of) individuals by whom the participants felt most craving, questions again referred to perceived positive social support and social negativity.

In accordance to Bertera (2005) and Sherman et al. (2013), we assessed positive social support and social negativity associated with the three (groups of) individuals by whom the participants felt most support or craving for the SSN and CSN, respectively (for the items see **Supplementary Material 2**). All items were rated on a four-point rating-scale from 1 (not at all) to 4 (very much). In our study, Cronbach's alpha for positive social support in the SSN was at 0.77 and in the CSN at 0.92. Cronbach's alpha for social negativity in the SSN was at 0.76 and in the CSN at 0.93.

Validated Instruments for Drinking Behavior

The German version of the Alcohol Abstinence Self-Efficacy scale (AASE, DiClemente et al., 1994; German-version: KAZ-35: Körkel and Schindler, 1996; Schindler et al., 1997) assessed the self- efficacy to stay abstinent in potential relapse situations.

The motivation to change was assessed by the German short version of the University of Rhode Island Change Assessment Scale (URICA, Mander et al., 2012). This instrument was adopted for the purposes of this study changing the open conceptualization of the problem to "problems related to drinking behavior."

Statistical Analysis

The statistical analyses were calculated using SPSS, Version 25.0 (IBM, Germany). The calculation of the structural aspects (i.e., size, age, composition, sustainability, frequency of contact) encompassed those people who were placed within the three concentric circles. The overall network size represented the total number of persons constituting the SSN or CSN, respectively. We calculated the mean values and standard deviations for all additional structural aspects (i.e., age, composition, sustainability, frequency of contact). We also identified these descriptive data for the functional aspects (i.e., positive social support and social negativity) including the three most important significant others.

Depending on the distribution of the variables, a paired *t*-test or a Wilcoxon signed rank-test served to determine any differences in structural or functional aspects between both social networks (RQ1/H1a). To test Hypothesis 1b, a one-sample *t*-test compared the sample's mean against the test value of the arithmetical minimum and the median was conducted. Analogously to research question 1, depending on the distribution, an unpaired two-sample *t*-test or Mann-Whitney-*U*-Test was used to compare the network characteristics of remitted vs. non-remitted participants (RQ2/H2).

RESULTS

Sample

The sample consisted of 55 participants, a third (33%) of them were female and more than a half of them (51%) lived in a partnership or marriage. The average age was 52 years (SD = 16.71), with almost half of the sample being retired (44%). About a third (31%) of the participants stated to have achieved a complete remission of AUD. The participants with a completed remission had significant higher abstinence self-efficacy [$U(1, 55) = 85.50$, $p < 0.001$, $d = 1.17$] but there was no significant difference in the Committed Action indicator for motivation to change. The majority of participants fulfilled the criteria of an alcohol dependency syndrome (84%) while the diagnosis of alcohol harmful use (16%) characterized a minority (**Supplementary Material 3**).

Differences Between Craving- and Support Social Networks

H1a: Referring to hypothesis 1a, participants received more positive social support from members in the SSN compared to the CSN [$t(37) = 6.00$; $p < 0.001$, $d = 0.97$] and more social negativity from the members in the CSN compared to the SSN, [$t(37) = -4.87$; $p < 0.001$, $d = 0.79$ (**Table 1**)].

H1b: The social negativity in the SSN [$t(55) = 6.00$; $p < 0.001$, $d = 2.50$] and the positive social support in the CSN [$t(37) = 13.72$; $p < 0.001$, $d = 1.85$] were significantly higher than the arithmetical minimum. The positive social support in the CSN was even significantly higher than the median of the scale [$t(37) = 2.36$; $p < 0.05$, $d = 2.50$], while social negativity in the SSN was significantly lower than the median of the scale, [$t(55) = -16.55$; $p < 0.001$, $d = -2.23$].

RQ 1: There was no significant difference considering structural aspects (i.e., size; age; composition: private persons, work-related persons; innovation; quantity) between the CSN and SSN, with the only exception of professionals to the advantage of the SSN, $z = -3.45$, $p < 0.001$, $r = -0.556$, and others to the advantage of the CSN, $z = -2.67$, $p < 0.0081$, $r = -0.41$ (**Table 1**).

TABLE 1 | Structural and qualitative aspects compared between the Support and the Craving Social Networks.

	Support social networks			Craving social networks					
	n	***M***	***SD***	***n***	***M***	***SD***	***t (n)***	***p***	***d***
Social support	55	3.41	0.35	38	2.77	0.71	6.00 (37)	<0.001	0.97
Social negativity	55	1.68	0.37	38	2.21	0.72	–4.87 (37)	<0.001	–0.79
Sustainability (month)	55	264.98	136.55	40	291.97	241.13	–1.61 (39)	0.116	–0.254
Frequency of contact[a]	55	3.19	0.98	40	2.62	1.38	1.86 (39)	0.071	0.294
	n	***M***	***SD***	***n***	***M***	***SD***	***z (n)***	***p***	***r***
Network size	55	29.64	75.00	40	303.40	450.23	–1.67 (40)	0.100	0.264
Age (years)[b]	55	48.63	10.73	39	47.88	16.42	–0.32 (39)	0.747	0.050

Annotation. All values of groups are relativized by group size.

[a]*Scale from 1 to 8 (1 = daily; 2 = more than once a week; 3 = once a week; 4 = more than once a month; 5 = once a month; 6 = more than once a year; 7 = once a year; 8 = less frequent).*

[b]*Age means average age of network members.*

Differences Between Remitted vs. Non-remitted Participants

H2: More than half of the remitted participants (53%) reported to have no CSN while only 16% of the participants who are not completely remitted reported no CSN [$\chi^2(1, 40) = 8.17$, $p < 0.01$, $V = 0.03$]. Participants with complete remission had significantly smaller craving networks compared to non-remitted participants, $U = 58.00$, $z = -2.39$, $p < 0.05$, $r = -0.38$. There was no difference in the size of SSN, $U = 32.00$, $z = 0.00$. With regard to social support and social negativity, there was only one significant difference: Remitted participants had lower rates of social negativity in the support social network than non-remitted [$t(53) = 2.52$, $p < 0.05$, $d = 0.74$].

RQ 2: Similarly to the age of participants with remission, their important others in the SSN were significantly older compared to the non-remitted group ($U = 145.00$, $z = -3.24$, $p = 0.001$, $r = -0.44$) and they have known each other for a longer period of time, U = 197.00, $z = -2.30$, $p < 0.05$, $r = -0.31$. The remitted participants reported to have less contact to their important others in the CSN, $U = 45.50$, $z = -2.82$, $p < 0.01$, $r = -0.45$. There were no significant differences in the other SSN and CSN network characteristics between the remitted and non-remitted group (**Supplementary Material 4**).

DISCUSSION

Given the limited sample size of this pilot, the results should be interpreted with caution. Nevertheless, the findings indicate how the application of SocNet could help clients, practitioners and researchers to discover the ambiguity of social relations with regard to AUD.

As predicted (hypothesis 1a), the SSN is characterized by a higher degree of positive social support and the CSN by a higher degree of social negativity. However, as supposed by hypothesis 1b, you can find some degree of social negativity in the SSN and even a medium degree of positive social support in the CSN. Referring to the differences between participants with and without remission (hypothesis and research question 2), participants with remission report more frequently to have no CSN and to have smaller CSN as well as to have less social negativity in their SSN.

These findings show once more the complexity of social relationships and its dynamics in the context of AUD (Mericle, 2014). In current research on the recovery of AUD (Mericle, 2014; Litt et al., 2018), patients are suggested to quit their CSN and to foster relationships with people outside of it. However, the findings of our study show the ambivalence of these social drifts. The relationships in the CSN seem to be associated with a medium degree of social support. Therefore, the findings show that through quitting the CSN individuals also could lose social support. Nonetheless, people remitted from AUD show smaller or no CSN in comparison to people with non-remitted AUD. This also reveals the systemic interrelations explaining AUD introduced by a social network perspective (Becvar and Becvar, 2009).

Thus, the current findings also imply that helping professionals could support concerned individuals in finding ways to keep less in touch or even quit their CSN through fostering their SSN. Therefore, the findings show the importance of incorporating social relationships into psychotherapy of AUD (von Sydow et al., 2010; Breunlin et al., 2011; Carr, 2019). To support individuals in the recovery process, these findings could also suggest the implementation of systemic social network approaches (Seikkula et al., 2001; Breunlin et al., 2011; von Peter et al., 2019) for the treatment of AUD.

Strength

This pilot trial suggests a more comprehensive approach for the study of social network characteristics of persons with AUD, through using the SocNet. This instrument could be helpful for future research in order to understand complex social structures behind any psychological disorders. In this context, the study at hand replicates the findings of a previous study on the SocNet in the context of social anxiety (Hunger et al., 2019) confirming the SocNet as an effective instrument to gain more insights into the ambiguity and complexity of social networks. Especially the medium degree of positive social support in the CSN adds to the line of research supposing a dilemmatic nature of relationships

with regard to AUD (Goehl et al., 1993; Howard, 2006; Young and Timko, 2015).

The cross-sectional differences between participants with remission vs. non-remission replicate the previous longitudinal findings on a successful recovery of AUD (Kelly et al., 2011; McCutcheon et al., 2014; Brown et al., 2015). Nevertheless, the introduction of a distinction between SSN and CSN extends these findings and indicates that some successfully remitted participants have maintained some contacts to important others associated to drinking.

Limitations

While this study is a pilot trial with limited sample size, this publication follows current research ethics that claim the significance of discussing such kind of studies before the realization of a fully powered research project (Arain et al., 2010; Thabane et al., 2010; Leon et al., 2011).

Additionally, it can be enhanced by the inclusion of external or behavioral criteria such as the common TFLB (Dulin et al., 2017) added by biological markers (e.g., heart rate variability, skin conductance response) and while controlling for social desirability. As several remitted participants gave us feedback that they have not understood the proper meaning of the motivation to change scale in their situation, future research could integrate other scales of motivation and check for this concern (Heidenreich and Hoyer, 2001).

Compared to comprehensive research studies, a major limitation of this study is its cross-sectional design. A longitudinal design within an intervention study could have several advantages: Firstly, assessing social networks before and after psychotherapy allows for a more precise evaluation of the SocNet's validity. Secondly, a longitudinal design adds to the external validity with regard to the development of social network interventions. Thirdly, a longitudinal design would probably lead to a higher number of CSN and it would be easier to compare group sizes because all participants would start as non-remitted.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because raw data cannot be anonymized. Requests to access the datasets should be directed to NB, niels.braus@uni-wh.de.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethics Committee of the Medical Faculty of Heidelberg University. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

NB drafted the brief research report. CH-S and SK helped edit the manuscript and approved the final manuscript. All authors contributed to the design of the manuscript.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2022.804567/full#supplementary-material

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Integrating Evolutionary, Cultural, and Computational Psychiatry: A Multilevel Systemic Approach

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This paper proposes an integrative perspective on evolutionary, cultural and computational approaches to psychiatry. These three approaches attempt to frame mental disorders as multiscale entities and offer modes of explanations and modeling strategies that can inform clinical practice. Although each of these perspectives involves systemic thinking, each is limited in its ability to address the complex developmental trajectories and larger social systemic interactions that lead to mental disorders. Inspired by computational modeling in theoretical biology, this paper aims to integrate the modes of explanation offered by evolutionary, cultural and computational psychiatry in a multilevel systemic perspective. We apply the resulting Evolutionary, Cultural and Computational (ECC) model to Major Depressive Disorder (MDD) to illustrate how this integrative approach can guide research and practice in psychiatry.

Keywords: cultural psychiatry, computational psychiatry, computational phenotyping, major depressive disorder (MDD), evolutionary psychiatry

INTRODUCTION

The Problem of Disciplinary Boundaries

Contemporary psychiatry assumes that gene–environment interactions over the course of developmental trajectories contribute to the etiology of mental disorders (1). These trajectories depend on processes at multiple levels, including epigenetic, neurophysiological, behaviors and interpersonal interactions, which are embedded in larger social systemic contexts. Our currently limited knowledge about such interactions is a challenge for efforts to ground diagnostic nosology and clinical practice in a mechanistic understanding of the relations between multiple levels that constitute the complex pathways to mental disorders (2). The aim of this paper is to advance an integrative perspective that bridges three theoretical domains in psychiatry,

which taken together, promise a mechanistic[1] understanding of the systemic processes and trajectories that underwrite psychopathology: evolutionary psychiatry, cultural psychiatry, and computational psychiatry.

Over the last 40 years, evolutionary, cultural, and computational psychiatry have each developed theoretical, empirical and clinical approaches to psychopathology. Although representing different conceptual models and research methodologies, all three approaches aim to advance non-reductionist, mechanistic, and multilevel account of the pathways to mental disorders. As the name suggests, *evolutionary psychiatry* endeavors to explain mental disorders in terms of the evolutionary and genetic origins of the phenotypic traits (12). *Cultural psychiatry* emphasizes the role of culturally mediated social practices in development and the circular causality between illness behavior and social context (13). Finally, the emerging field of *computational psychiatry* studies failures in decision-making and dysfunctional behavior using multi-level computational models (14).

Despite some recent exceptions (15, 16), each approach has remained largely siloed. This lack of dialogue results from institutional and conceptual difficulties in crossing disciplinary boundaries (17). Disciplinary boundaries are the consequence of particular research histories and traditions but also reflect specific scientific ontologies (18). Ontologies underwrite research agendas (19), which reflect researchers' beliefs about what questions science should address and what kind of answers are satisfying (20), and that lead researchers to operate under different "thought styles" (21). Disciplinary ontologies require that researchers become skilled in using specific methods, which render measurable and ontologically "real" or conceivable certain dimensions of the object of inquiry (22). By the same token, due to constraints of time and resources, commitments to disciplinary ontologies also limit researchers' skills and impede the study of certain dimensions of phenomena and may make them invisible or even inconceivable. The result then is progress on some fronts but lack of attention to other, possibly crucial, facets or dimensions. This effect of disciplinary ontologies is especially concerning in the context of psychiatry, which is concerned with human problems that clearly involve multiple processes that affect physiology, behavior and experience (23). Advancing an integrative perspective, requires some way to move beyond these disciplinary blinders. We propose that unifying cultural, evolutionary and computational psychiatry can enable significant strides toward an integrative view.

[1]In this paper, we use a folk concept of mechanism—of the sort that any typically trained psychiatrist would have in mind in clinical case formulation. In this context, a mechanistic approach may be loosely defined as one that analyses the causal processes that produce a given (psychiatric) outcome, through reference to constituent components and their interactions. There is an important debate in the philosophical literature about the precise nature of mechanism (3–5). Our previous work on the embodied and situated human brain is aligned with a neo-mechanistic perspective in the philosophy of science [e.g., (6–9)], which explains the properties, functions, and behavior of a system by examining the properties and activities of its various subsystems and their interactions. Here, a mechanism can be described as a structure (or a stabilized process) within a system that performs a function via its component parts, their various operations, and their organization, thereby contributing to global function in one or more ways. According to previous work on the hierarchically mechanistic mind (10) consistent with the present approach, the human phenotype is produced by causal mechanisms that span multiple spatial scales (e.g., genes, cells, tissues, organs, the body, and the broader social and physical environment), as well as temporal scales (ranging from evolutionary/intergenerational processes, through to developmental influences, and mechanisms that operate in real-time biopsychosocial contexts) (11). In short, this multilevel theory describes human phenotypes in terms of the biopsychosocial processes that operate within and across different spatiotemporal scales, and in this sense, it is both mechanistic and hierarchical.

The Scope of the Integrative Perspective

This paper starts with an overview that lays out some assumptions and methodological strategies employed in evolutionary, cultural, and computational psychiatry (§2). We will not discuss evolutionary, cultural or computational psychiatry in their entirety. Rather, we focus on key aspects of these approaches—mainly modes of reasoning about mental disorders—that could be merged through an interdisciplinary way of thinking about mental disorders.

Key Aspects of Evolutionary Psychiatry

With respect to evolutionary psychiatry, we will focus on adaptationist reasoning about pathological mental traits, which can be distinguished from population genetics thinking (24). Adaptationist reasoning in evolutionary psychiatry emphasizes the role of natural selection when making sense of mental traits observed in clinical settings (25); population genetics thinking may be viewed as a research driven attempt at explaining changes in the genetic makeup of a population and the preservation of alleles that contribute to certain mental disorders (24). The distinction between population genetics thinking and what we call adaptationist thinking can be framed more generally in terms of what some historians have identified as the distinction between the modern synthesis and the ethological perspective (26). This division is interesting in that it carves out two interconnected questions about mental disorders that are approached with distinct reasoning patterns. The ethological perspective asks, "How can we understand mental disorders as traits that have evolved in humans and other animal species to serve certain functions?" and seeks answers based on the relation between phenotype (e.g., behavior) survival value and fitness. In turn, the modern synthesis perspective asks, "How can we explain the preservation of alleles underlying mental disorders in a population?" and seeks answers based on a wide array of evolutionary mechanisms, including, though not limited to, the logic of survival and fitness under natural selection (e.g., drift, mutations, and gene flow). The extension of the modern synthesis—the extended evolutionary synthesis (27)—suggests supplementing the mechanisms of evolution with channels of inheritance and processes that are external to the organism (e.g., cultural inheritance, niche construction, and development). The adaptationist rationale—on which we focus—can be assimilated to the ethological perspective.

Key Aspects of Cultural Psychiatry

With respect to cultural psychiatry, we will focus on how cultural context may shape mental disorders through a variety of intra- and interpersonal feedback loops, including what Hacking

has termed "the looping effect of human kinds" (19). Cultural psychiatry studies the ways in which culture and social context shape the etiology (causes), phenomenology (experience), clinical presentation (expression), and trajectory of mental disorders (28). This includes the person's own modes of self-construal and the responses of others, which draw from cultural narratives, models and metaphors. Taken together these constitute the ontology of a mental disorder. Although this will not be our focus here, it is important to note that cultural psychiatry also leverages the notion of culture to orient clinical assessment, treatment, and prevention (e.g., situating illness experience in its social and cultural context to identify the significance of cultural expressions of distress and their impact on the course and outcome of mental health problems) (29). Cultural psychiatry also emphasizes self-reflexive practice, through studies that reveal the cultural assumptions of the institutions of psychiatry itself (e.g., ethnocentric biases) that may affect mental health research and clinical practice as well as illness experience (30, 31).

Key Aspects of Computational Psychiatry

With respect to computational psychiatry, we will focus on the rationale of modeling psychiatry. Computational psychiatry involves the use of algorithmic methods to model and analyze clinical and behavioral data (32). This includes two broad, though interrelated lines of work in computational psychiatry: (i) *data-driven* computational psychiatry, involving the use of artificial intelligence and machine learning with large datasets ("big data") to develop more precise characterizations of patients that have some predictive validity in relation to treatment response and course of illness; and (ii) *theory-driven* computational modeling, which develops biologically plausible accounts of neural processing that can explain particular forms of psychopathology (33). The focus here will be on the latter approach, which aims to understand the mechanisms of psychiatric disorders by constructing computational models.

Our proposed integration of cultural, evolutionary and computational psychiatry aims to show how adaptationist thinking and the social-cultural notion of looping effects can be integrated using the methods of modeling psychiatry. To illustrate the potential of this integration, we describe a generic model for the study of mental disorders that inherits principles of evolutionary and cultural psychiatry (§3). The hope is that the resulting Evolutionary Computational Cultural (ECC) model will exemplify the interdisciplinary approach we advocate. The end of part three illustrates an application of this model using the clinical example of Major Depressive Disorder (MDD).

EVOLUTION, CULTURE, AND COMPUTATION IN PSYCHIATRY

The difference in disciplinary ontologies poses a central theoretical challenge for collaboration among evolutionary, cultural and computational psychiatry. How can we think through the ideas of the evolutionary approach in computational terms; of cultural ideas in evolutionary terms; or computational ideas in cultural terms? What do we need to know to map one theoretical construct onto the other and what concepts and relations require special attention? This process of inter-theoretic mapping needs to start with a general understanding of principles employed in evolutionary, cultural and computational psychiatry. We will now consider adaptationist thinking, the ontology of mental disorders, and modeling psychiatry.

Evolutionary Psychiatry

Medicine often employs functional models of health and diseases based on principles of human physiology. These models indicate how the body is supposed to function. Pathology can then be identified as a disruption or impairment of this function (34). For instance, we assume that the heart is designed to pump blood; and this is why, no matter the cause, congestive heart failure may be confidently described as a malfunction (35, 36). Although efforts have been made to define mental dysfunction in a similar way (37, 38), this effort has been impeded by the fact that the human mind has multiple functions that depend on adaptive context. Attempts to characterize brain function are intensively debated (39). One consequence of this lack of clarity about the functions of mind and brain is difficulty in distinguishing between disorders and protective responses (35). For instance, we know that congestive heart disease is a disorder and that fever is a protective response, because the former can be said to result from a failure of a function of the heart (e.g., pumping blood), whereas the latter reflects a functional biological response to infection (35).

Evolutionary psychiatry has sought to address this limitation by exploring plausible functions of mind and brain against the backdrop of human evolution. By applying the principles of evolutionary biology and psychology, evolutionary psychiatry aims to provide a basis to distinguish normal and pathological mental functioning, based on the notion of adaptive fitness (40). This leads to a view of mental disorders as "harmful dysfunctions" (41). As will be detailed below, in the account of mental disorders as "harmful dysfunctions", the dysfunction refers to the functional aspect of the proximal mechanism (e.g., regulation of dopamine signaling), whereas the failure is defined in terms of discrepancies with respect to the way that mechanism ought to function from an evolutionary point of view (e.g., regulation sufficient to enable an adaptive response to the environment). In turn, the "harmful" component refers to value-laden terms that are often qualifiers of the disorder (e.g., autistic individuals' "lack of motivation").

The problems that surround Wakefield's concept of mental disorder are at least two-fold (42). First, there is the problem of identifying the evolutionary adaptive process against which the dysfunctional mechanism can be evaluated: this has been termed "the problem of evolutionary function". Second, there is the problem of the scientific validity of the notion of "harmful", which is generally recognized to be, at least partially, socially and historically contingent. Indeed, according to the view of harmful dysfunction theory, although value-laden qualifiers are an essential part of the definition of mental disorders, the study of their functional role is difficult to assimilate to a purely evolutionary view. Yet, as argued by cultural psychiatry, unpacking the meaning of "harm"

and other evaluative qualifiers is essential since psychiatric disorders are both biological and social constructs that always occur in particular cultural contexts. This article will focus on the latter problem. In the section on Cultural Psychiatry, integrating a cultural approach will allow us to address this problem by providing a more complete view of the mechanisms of mental disorders that explicitly incorporates humanly constructed contexts and corresponding social interactions.

Defining Mental Disorders With Proximate and Ultimate Thinking

Evolutionary psychiatry proposes a research heuristic for the study of mental ill-health, organized around the question of "why did evolution leave us with traits that make us vulnerable to mental disorders?" (43). This framework integrates proximate (e.g., developmental) and ultimate (i.e., evolutionary) levels of causation when defining mental disorders [for a summary see: (44)]. Sciences that study proximal mechanisms typically answer questions of the form "how does it work?", (e.g., "how does experience-dependent neuroplasticity operate?"), whereas sciences that study ultimate causes answer evolutionary questions of the form "why does it work?"; (e.g., "why has experience dependent plasticity been preserved throughout human evolutionary history?") (45).

Evolutionary psychiatry defines mental disorders as dysfunctions of adaptive systems (or consequences of adaptive systems that are maladaptive in a new niche or context), and explains disorders in terms of vulnerabilities aggravated by developmental demands. Note, however, that this type of explanation remains controversial (46). Some mental disorders have been viewed as adaptive dysfunctions, that is, as adaptations *per se* [e.g., psychopathy as an adaptive strategy from a game theoretic point of view (47)]. In this review, we will not pursue the view of mental disorders as adaptive dysfunctions. Rather, we will focus on explanations in terms of aggravated vulnerabilities. The integration of proximate and ultimate causes allows evolutionary psychiatry to study the impact of evolutionary pathways on the nature of mental disorders and their expression over the lifespan. The proximate part of this view describes the workings of the specific mechanisms underlying the development of pathology and their expression in symptomatology, suffering or functional impairment. Conversely, the explanation in terms of ultimate causes involves relationships between mechanisms and traits (and their associated vulnerabilities) that are conserved over evolutionary history (48). In short, integrating proximate and ultimate causes allows evolutionary psychiatry to explain psychiatric conditions from the point of view of vulnerabilities stemming from phylogenetically old traits (49).

Proximate and ultimate thinking in psychiatry tends to operate under two interrelated modes of evolutionary thinking: adaptationism and population genetics. Of course, the distinction between evolutionary influences that constitute proximate and ultimate causes is made for epistemological reasons. A more fine-grained assessment of causality would consider phenomena across multiple spatiotemporal scales, ranging from biochemical to evolutionary, including the scales of individual developmental trajectories and of the coevolution of the human brain and our cultural niches (50). The strategy of dividing causality into proximate and ultimate causes allows us to distinguish phenomena about which we can meaningfully ask questions like "Why has it evolved to work that way?" from phenomena about which we would better ask "How does it work?". For instance, ultimate causes may capture phenomena that unfold on a historical timescale for which answers to "how" questions will likely remain uncertain (e.g., "What were the exact mechanisms at play in the evolution of this population?"), and for which the response to a "Why" question may be preferred (e.g., "What principles of evolution can explain why this feature might emerge?").

Adaptationist Thinking

One popular strategy for the study of evolutionary pathways to mental disorders is the adaptationist approach (51), which relies on the notion that evolution favors the replication of variations that lead to reproductive success (fitness). Since differential reproductive success is correlated with being adapted to environmental stressors, the genetic material passed onto offspring should lead to phenotypic traits that will be adapted, or well "designed", to respond to these stressors (52). As applied in evolutionary psychiatry, adaptationism relies on the idea that vulnerabilities are shaped by Darwinian selection. Typically, it is not that natural selection selects "for" disorders (e.g., viewing disorders as affording some fitness advantages) (53). Rather, ultimate causes must be viewed as shaping genetic traits that may be expressed as suboptimal traits or vulnerabilities under certain proximate, developmental conditions (48). Put another way, the maintenance of "any suboptimality [or vulnerability] of a part is explained as its contribution to the best possible design for the whole" [(54), p. 586]. Again, the question is not "how do genes that predispose to a mental disorder provide a selective advantage?" (55) nor is the question directly "how do genes that predispose to a mental disorder persist?". Rather, the question is "why are we vulnerable to some mental disorders?", the answer to which explains the clinical presentation of the mental disorder in the current context. This is important because explanations in psychiatry should be explanations of mental disorders, not only explanations of their underlying biology. As we will see with cultural psychiatry, mental disorders are entities configured at the level of human agency and subjectivity. Inquiring how aspects of a person's biology make that person vulnerable to a mental disorder is usually more immediately relevant to clinical practice than exploring the evolutionary origin of that biology.

Darwinian rationales have been used to explain different pathways to mental disorders in terms of the maintenance of vulnerabilities in human evolutionary history (ultimate cause) enabled by developmental context (proximate cause). **Box 1** summarizes some of the popular rationales in adaptationist accounts of medicine in general. Darwinian rationales have been applied to explaining mental disorders such as anxiety, phobic, delusional, stress-related and depressive disorders among

BOX 1 | Adaptationist explanations for psychopathology.

Mismatch: Vulnerabilities may emerge from differential rates in evolution that generate mismatches between the cultural developmental environment and evolutionarily old dispositions (e.g., disordered eating patterns leading to obesity, because of humans' tendency to seek energy-rich, sugary and fatty foods that were scarce in our ancestors' environment but that are now abundant) (56). A mismatch happens when the rate of change of environmental stressors exceeds the rate of change of individuals' adaptation. Depending on the scale at which the mechanism of adaptation lags behind, a mismatch will either be defined as *developmental*—i.e., a body-environment mismatch (57); or *evolutionary*—i.e., a genotype-environment mismatch (58, 59). Developmental mismatches are assumed to impair realized fitness (i.e., individuals' reproductive success), whereas evolutionary mismatches are assumed to impair the ability to achieve expected fitness (i.e., the sum of reproductive success weighted by fitness across all possible environments).

Constraints: Constraints on selection arise when the cost of adapting a vulnerability through natural selection is higher than the cost of preserving that vulnerability in the population. For instance, the cost of delivering human infants through the pelvis, although painful and often dangerous, does not outweigh the cost of reengineering the birth canal (48). "Rule of thumb" logical reasoning outweighs its cost in terms of logical errors (60); and Huntington's disease has a limited cost since its symptoms do not appear before the age of child-bearing (61).

Trade-offs: Trade-offs also favor the selection of vulnerabilities understood as defenses, according to "smoke detector" explanations (62). Smoke detector explanations apply in cases where it is more cost efficient to select for genes that result in traits likely to trigger false alarms than to fail to detect threat (e.g., predator or fatal pathogen). For instance, acute sensitivity to anxiety provoking situations increases the success of fight or flight responses (and thereby contributes to reproductive success), but it increases vulnerability to anxiety disorders. Similarly, fever is a defense against infection (63) but it may increase to the point of causing seizures

other mental health problems (64–67). Importantly, all of these approaches assume the embeddedness of the individual in a larger systemic context. For instance, following a Darwinian rationale, the social risk hypothesis of depression (15, 68, 69) argues that normative symptoms of depression—triggered by social uncertainty—form an adaptive biobehavioral strategy that might have been selected to ensure the restabilization of individuals' social networks. Here, depression is thought to reduce socio-environmental volatility *via* three broad classes of action: it increases an individual's cognitive sensitivity to social risks; it reduces her propensity to engage in social behaviors with uncertain outcomes; and it promotes social signaling behaviors to elicit interpersonal support and defuse competitive encounters (e.g., reassurance seeking). When these responses fail to alleviate social stress (e.g., signaling fails to increase interpersonal support), depressive symptoms endure, and the individual can spiral into more severe and persistent distress that is recognized as clinical depression. To account for the prevalence of depression in a given population, from an epidemiological perspective, one could couple the social risk hypothesis with an evolutionary mismatch rationale (see **Box 1**) to explain why depression may increase in a society in which people tend to have sparse human social networks.

Limits and Prospects of Adaptationist Rationales

Adaptationist accounts explain mental disorders in terms of the vulnerabilities of systems that evolved to serve an adaptive function (e.g., depressive symptoms are an adaptive vulnerability whose function is to reconsolidate social networks but that can spiral into maladaptive responses). This makes an explicit link between normal functioning and pathology and provides a rationale for research with animal models that involve similar biobehavioral systems (70); hence the ties of adaptationist thinking with the ethological perspective. Adaptationism has been critiqued, however, on methodological and conceptual grounds (67), among others, on the fact that traits may persist and lead to vulnerabilities through processes other than selection (71). Indeed, there are many cases that cannot be explained solely based on Darwinian thinking. For instance, disorders such as schizophrenia, bipolar disorder, eating disorders, and obsessive-compulsive disorder are known to impair reproductive success (24). All things being equal in the world of natural selection, genetic variants predisposing individuals to such disorders (e.g., genetic vulnerabilities) should have been eliminated from the gene pool long ago. To explain pathways to mental disorders based on traits that have no obvious adaptive value, evolutionary accounts of mental disorders can go beyond the adaptationist narrative by appealing to other population-level phenomena.

Explanations based on population genetic thinking provide a complement to Darwinian explanations [for a review see: (24)]. For instance, processes of *balancing selection* can maintain multiple variations of alleles in the same gene (i.e., polymorphism) whose net fitness effects balance each other out, depending on the genetic or environmental context (72). Balancing selection requires that all the alleles involved have roughly equivalent fitness, and that some mechanisms countered the normal loss of these alleles due to drift. A good example of a balancing selection process is frequency dependent selection, where the fitness of some unit (e.g., allele AA) or trait depends on its frequency in a population [e.g., the hawk-dove situation (73)]. Frequency dependent selection might explain the maintenance of allelic susceptibility to psychopathy, as people with psychopathy would gain a fitness advantage in a population where the allele is rare and becomes disadvantageous when frequent because of anti-cheater vigilance (53, 74, 75). Like adaptationist rationales, rationales from population genetics explain the persistence of dysfunctional genetic variations (e.g., vulnerabilities to illness) that would normally impair evolutionary success. This provides evolutionary psychiatry with a functional model of mental health and disease based on biological principles. It is important to note that there are many other population genetics models that can explain the persistence of harmful variations (24). The example of balancing selection is introduced here to warn against overly simplistic adaptationist stories, which are often difficult to test. That said, adaptationist accounts can provide satisfying explanations for some mental disorders. Crucially, adaptationist rationales point to the likelihood that many mental disorders are based on otherwise adaptive functions (25). These rationales can lead to rethinking medicalization or conventional psychiatric nosology

by acknowledging the close links between adaptive strategies and pathology (76).

There are also limitations to the adaptationist approach that are external to it. As the logic of evolutionary biology goes, proximate causes acquire explanatory value in so far as they relate to ultimate causes, which are located in evolutionary history. However, in many instances, this history refers to the emergence of human beings in an evolutionary environment of adaptation quite different from our current environments. Evolutionary explanations either appeal to vulnerabilities that arose because of this evolutionary history or focus on discrepancies between past environments, to which we were well-adapted, and current contexts, which pose new challenges (cf. **Box 1**). New challenges in current contexts, however, are dependent upon socio-cultural features like cultural practices, values and social institutions, whose causal contribution to mental health should be considered (77). Moreover, humans have been co-evolving with our socially constructed environments for millennia (50). Thus, half of the story is missing here. As we will see next, cultural psychiatry provides a concept of mental health consistent with evolutionary thinking, which can provide a mechanistic account of the social systemic embedding of mental health and illness.

Cultural Psychiatry

Cultural psychiatry acknowledges the influence of multiple processes in establishing the boundaries between the normal and the pathological in biomedical science and clinical practice (70). However, it insists that any perspective must acknowledge context dependence; that is, the influence of socio-normativity of the local cultural contexts. This is crucial to produce definitions of mental disorders that have a grip on clinical practice. Moreover, cultural psychiatry argues that evolutionary history itself is shaped by current cultural concerns and dominant ideologies that may obscure the nature and range of human functioning in health and illness (78, 79). Accordingly, for cultural psychiatry, an evolutionary perspective must consider the social normativity that underlies the use of evolutionary principles to define the normal (functional) and the pathological (dysfunctional) (e.g., the manner in which values of a local ethnomedical practice shapes illness experience and thereby themselves move the boundaries of the normal and the pathological (77, 80).

Cultural psychiatry does not endorse a radical social relativism, which would discount any effort to recognize mental disorders across cultures. Mental disorders are not simply social constructions; they are fundamentally biological. But cultural psychiatry insists that human (neuro)biology is itself fundamentally social—neurodevelopment and adult functioning involve the embedding of the individual in a socially constructed niche and larger interactional systems that are configured by cultural knowledge and practices (81). Recent human evolution has involved cultural-biological coevolution, so that even our thinking about mental disorders in evolutionary terms must engage with the impact of humanly constructed worlds on the structure and function of our brains. Moreover, changes in these social and cultural systems happen faster than evolutionary changes creating potential discrepancies between functional systems and current adaptive demands. The key questions for cultural psychiatry then are not only those that relate to the way in which the social world shapes the experience, definition of, and response to mental disorders, but equally how social contexts and interactions contribute to the underlying mechanisms and developmental trajectories of disorders: that is, how and when mental disorders are constituted by processes that reflect their social systemic embedding.

It is hard to see how one could disagree with the holistic view of mental health proposed by cultural psychiatry. Yet, historically, these claims have been given mostly lip service, as bioreductionism still appears to run deep in psychiatry. To understand the project of cultural psychiatry, we must take a short glance at the recent history of psychiatry and the concept of mental disorder it has employed.

Historical Overview of Bioreductionism

The operationalization of diagnostic categories ushered in by DSM-III in 1980 aimed to provide a taxonomy useful for clinical assessment that could also guide research aimed at identifying discrete disorders, each with its own etiology, mechanisms and symptoms (82). Categorical approaches were born from a "biomedical" approach to research and practice that focused on the proximal, biological factors at play and their associated phenotypes (83, 84). The categorical approach of the DSM-III and its successors emerged against the background of already ongoing arguments for a broader *biopsychosocial approach* to assessment (85, 86). On the biopsychosocial view, the illness must be understood in terms of a multilevel hierarchy from molecules to behavior. This affords a conceptual space that accommodates clinical observations in the real-world contexts of disorders (87). However, the hope of characterizing disorders in terms of underlying (biological) mechanisms and the lack of appreciation of the causal effects of social systemic processes has undercut integrative approaches [e.g., (88, 89)].

The current Research Domain Criteria (RDoC) developed by the United States National Institute of Mental Health reflects the emphasis on biological correlates, as it doubles down on neuroscientific research, with the hope of formulating disorders in terms of their (mostly neural) phenotypes and/or measurable (neuro)biological traits (90). Despite the integration of behavioral and phenomenological (e.g., through self-reports) units of analysis, the RDoC framework remains largely bioreductionist (70). In emphasizing biological research, the RDoC relies heavily on evidence derived from animal models. Unfortunately, we have no animal models of many distinctive components of human experiences relevant to mental health and illness, such as narrativity, morality, racism, political violence (91). Reductionism thus is bound to operate with a stripped-down biology that emphasizes brain circuitry over psychological functions and social systemic processes. This makes it difficult for psychiatry to advance its goal of a mechanistic understanding of all the components that make up the gene-brain-person-environment pathway to explain mental disorders. Cultural psychiatry seeks to move toward a concept of mental disorder that remains mechanistic and functional while accommodating culture and context.

Toward a Non-reductionist Concept of Mental Disorder

The concept of disorder in psychiatry refers to behavioral patterns that cause psychological distress and functional impairment, and only indirectly to the failure of biological mechanisms. It describes a situation configured at subjective, phenomenological, psychological and social systemic levels (77). Mental disorders are inherently value-laden and shaped by socio-normative causes—e.g., the way we identify the harm resulting from mental ill-health—as much as they are produced by biological causes.

In considering distinctions between health and pathology, cultural psychiatry raises an additional difficulty: namely, giving a scientific account of "harmful". We need to identify and test the mechanisms by which judgments themselves, understood as objects of language, become consequential for individuals' functioning, wellbeing, social status, etc. Institutional discourse shapes illness experience, which means that we need a functional account of how individual and institutional discourse influence the mind, and how the mind comes to affect institutions. In the notion of 'Harmful dysfunction', the harmful and the dysfunctional must be given equal scientific consideration.

Accordingly, cultural psychiatry defines mental disorders: (i) *pragmatically*, as conditions treated by the discipline of psychiatry, or corresponding local healing practices; (ii) *normatively*, relative to the conceptions of the normal and the pathological given by local medical traditions and practices; and (iii) *ontologically*, as having bodily, psychological, or social systemic causes (30). In employing cross-cultural and ethnographic methods, cultural psychiatry can work out the pragmatic and normative aspects of mental illnesses [e.g., assessing the manner in which individualism in Western culture impacts health and wellbeing (92–95)]. Here we focus on the ontology of mental disorders but recognize the fact that the category of pathology is a moving target influenced by language and culture. Although this remains a challenge, cultural psychiatry captures the moving aspect of ontology using the theory of the looping effects of human kinds, developed by Hacking (19) and (96). We believe that one can leverage the mechanics of looping effects of human kinds to think about a scientific study of the "harmful" in Wakefield's concept of mental disorder.

Kinds are epistemological notions that refer to conceptual classes used to classify, sort or discriminate different objects (19). Natural kinds, for instance, classify objects that undergo *efficient causality*, in the sense that when they are acted upon, those objects conserve the same set of properties. However, objects classified as human kinds, such as mental disorders, do not only undergo efficient causality; they undergo *practical causality*—that is, they change their behavior by virtue of the act of being classified or labeled. This means that kinds are desirable, or undesirable to the people whose behavior fall under their classification (19). It is because they are value laden (that is, they depend on the values assigned to them through social practices) that human kinds are endowed with a causal power different from that of natural kinds. For instance, if N is a natural kind, and Z is an object of the natural kind N, classifying Z as an element of N has no causal effect on Z (19). For instance, if "atom" is a natural kind, calling an "atom" "hydrogen" has no causal effect on hydrogen as an atom. What might change is the way the classifier would engage with hydrogen. The same applies to human kinds (e.g., if I call Denis "autistic", it will change the way I engage with him). However, while classifying "atom" as "hydrogen" changes only the behavior of the classifier, classifying Denis as autistic also changes Denis' behavior. In contrast to the atom, Denis can become aware of his classification and may change his behavior accordingly. Denis might make less effort, or lose motivation to engage socially because of self-perception and self-evaluation based on his understanding of the classificatory label, or because of his internalization of the stereotypes and social stigma applied by his social partners (97). These proximal interactional effects are, of course, embedded in larger social systemic processes and structures that are major determinants of health and illness (98, 99).

Categories of mental disorders are about people and the criteria they are based on often reference behaviors that are value laden. In turn, our categories of people, their character and values are all culturally shaped (100, 101). This leaves the ontology of any given mental disorder open to change as a function of local cultural changes in norms, conceptual categories, and epistemic practices. For instance, as diagnostic activity and treatments may recognize certain configurations of experience and affliction, clients may access new ways to interpret their experience, thereby yielding corresponding clinical presentations that reinforce the clinician's impression of the validity of the category (30).

Looping effects may entail a shift from one locus to another, such as in cases of somatization, where the affliction may start as a social experience, and then become psychological, bodily, and then social again. Somatization is found across cultures (102) and appears to reflect basic psychophysiological processes that are shaped by culturally specific ways of life and modes of illness experience. These modes of illness experience are culturally patterned ways of expressing bodily and psychological afflictions that reflect cultural models (103). Cultural models are stable discursive and expressive styles of illness experience encoded in individuals' cognitive schema, embodied practices, interpersonal interactions, discourses, and social institutions. It is these cultural models that lie at the interface of individuals and the larger social world to mediate the looping interaction between somatic and emotional/psychological distress (104). Looping effects in cultural models are promising candidates for a mechanistic account of the harmful, in Wakefield's definition of mental disorder as harmful dysfunction.

Prospects for an Ecosocial Model of Mental Health

Cultural models point to a concept of mental disorder that recognizes the causal power of social labeling of behavior and experience as *harmful* and aligns more generally with the biopsychosocial approach that recognizes individual cognitive and adaptive processes are embedded in larger social systemic contexts (87). Cultural psychiatry situates the open-ended looping ontology of mental disorders in an

ecosocial model of mental health (105), which—much like recent multilevel approaches in psychology (10, 106, 107) and cognitive anthropology (108)—assumes that humans are part of a hierarchically organized, dynamical social ecosystem that includes the brain, the body, and the social and physical environment (109). This means that psychopathological entities may involve dysfunctions not only in their subcomponents (e.g., neuroatypicalities; bodily impairment; and dysfunctional social milieu), but in the system dynamics that bind these components together (110). These dynamics include feedback regulatory processes and mutually causal looping effects that can amplify or self-sustain a psychopathological state (105).

The ecosocial model of mental health gives explicit attention to the systemic embedding of human biology and psychology by drawing links or loops between our self-descriptions (as ill or well) and interactions with the brain, body, and society. It encourages us to consider the multiple forms of social systemic process that give rise to human experience in sickness and in health. In so doing, cultural psychiatry aims to lay bare not only the constructs, norms and constraints that constitute mental disorder as a social reality, but also the cognitive and social interactional processes that may be etiological factors, part of basic mechanisms of psychopathology, and determinants of illness course and outcome. The resultant models of pathology trace the circuits of the mind, which reside not only in the brain but in the social world. However, although well-framed to advance an integrative approach, the ecosocial model of cultural psychiatry, in its current form, remains mainly a narrative description of the mechanisms at the interface between external levels of causation (e.g., socio-material systemic processes) and internal (e.g., brain-based) levels of causation, making it difficult to operationalize in empirically testable models (111). To remedy this, we next consider ways to implement looping dynamics—that undergird the ecosocial model—within the formalism of computational psychiatry.

Computational Psychiatry

As a domain of clinically applied research in psychiatry, computational psychiatry is primarily motivated by recognition of the shortcomings of current psychiatric nosology in providing diagnostic categories that predict treatment response and outcome and that are linked to mechanistic explanations of disorder (112). However, computational methods also allow us to build models of biological processes that are systemic—that is, they can model networks of many interconnected components and reveal the resulting dynamics. This has proved a powerful approach in systems biology at many levels and, in particular, in efforts to understand how embodied and embedded and extended neural networks can give rise to cognition, behavior, and experience in health and illness.

In this section, we focus on an approach to theory driven modeling in psychiatry known as *active inference* (113–115). Active inference has been proposed as a general framework for understanding the computational processes that underlie cognition and adaptation, which essentially involve prediction of sensory inputs and the effects of actions. This approach understands mental disorders in terms of failure to infer or represent causes of sensations in the world based on Bayesian beliefs, and to act accordingly (112).

Under active inference, mental disorders are defined and modeled in terms of a failure of cognitive functions such as (i) perceptual inference and (ii) adaptive behavior as action planning. Within the terms of our current discussion, active inference can be viewed as seeking an explanation of proximate causes of dysfunctions, where dysfunctions should be understood as suboptimality of perception and action, or Bayesian suboptimality (116). The question active inference asks is: Assuming that the brain operates optimally, how is it that the brain can generate suboptimal behavior? This question is close in nature to that of evolutionary psychiatry: if natural selection optimizes organisms' adaptation, how is it that natural selection can generate suboptimal phenotypic traits (e.g., vulnerabilities)? In both cases, the answer is that suboptimality is the outcome of an optimization process that has "gone wrong" given the developmental, environmental, or social-contextual conditions under which the maladaptation emerged. For evolutionary psychiatry, things can go wrong, for instance, because of a mismatch between the environment of evolutionary adaptation and contemporary social contexts. For computational psychiatry, the optimization process goes wrong when something happens to the cognitive machinery, because of lesions, autoimmune, neoplastic, infectious, or neurodevelopmental anomalies, alterations in neurochemical or neuromodulatory processes, or changes in brain circuitry that may be a result of environmental interactions and learning histories. However, drawing from the arguments of cultural psychiatry, this circuitry may involve systemic processes that extend beyond the brain. We will explore those processes in the Section on Computational Phenotypes Beyond the Brain below.

Computational Phenotypes

The theory of active inference allows one to produce computer models of pathological and healthy brain functions to study the effects of various kinds of interventions (mostly psychopharmacological). These models are meant as coarse-grained maps of the brain that translate neuronal architectures (i.e., synaptic connectivity) into parameters, and brain dynamics into belief updating schemes and learning algorithms that update model parameters. Models can be altered in ways that correspond to lesions or interventions and the resultant artificial analogs to behavior can be safely studied *in silico* (117, 118). Of course, the models are inevitably simplified versions of neurobiological systems. When the parameters of these models reproduce psychiatric phenomenology they constitute computational phenotypes: in other words, they provide analogs of pathological neural phenotypes (39). Under active inference, computational phenotypes are statistical generative models that employ Bayesian principles. Crucially, these generative models comprise priors—at many levels—which characterize a particular individual or psychiatric cohort (1, 119). The models are called *generative* because they generate observable consequences from unobservable causes. On this view, the brain is in the game of inverting or fitting a generative model to sensory data; namely, inverting the mapping from causes to

consequences to infer unobservable states of affairs in the world from their sensed consequences.

Active inference—in theory-driven modeling psychiatry—assumes that the neural processes underlying perception involve inference *via* the inversion of a generative model [for a discussion of inference under *generative models* and classification under *discriminative models*, see: (120)]. A generative model is simply the joint probability over the causes and consequences that is usually factorized into a likelihood (i.e., the probability of some sensory consequences, given their causes) and prior beliefs (i.e., the prior probability of some causes or hidden states before seeing sensory data).

Active inference assumes that the brain embodies a generative model of its sensory impressions. Sensory impressions correspond to sensory data (e.g., the activity of wavelength selective photoreceptors), and inference corresponds to the inferred cause of the data (e.g., a color). If priors in the generative model are apt to represent the world, the inference about the causes of the data will provide an accurate account of those data in terms of causes, as simply as possible (technically, with minimal complexity; namely, the difference between prior and posterior beliefs). Suboptimal perceptual inference can arise because of a functionally impaired system (e.g., a lesioned brain), or poorly learned priors (e.g., lack of appropriate training experience or a change in circumstances). Generative models instantiated by the brain are highly complex. They are universally composed of hierarchically organized priors (e.g., they contain priors about low-level causal patterns and higher-level abstractions) that are parameterized to reflect the dynamic structure of the world that they are meant to recapitulate.

Inferring the causes of sensations is but one component of the overall task that the brain has to accomplish. The other key task is to select actions that make inference as efficient as possible. Within the context of modeling brain functions, a generative model will include prior beliefs about transitions between states of the world (e.g., moving from "my side of the street" to "the other side"), given allowable actions (e.g., "go forward;" "go backward," etc.). The imperatives for action selection are the same as those for perceptual inference; namely, to maximize the marginal likelihood of sensory data, under the generative model. The only difference is that for policy selection, this likelihood is averaged over the outcomes predicted under the policy in question. The generative model thus can also infer the best course of action, or action policies (i.e., sequences of plausible actions). In short, active inference assumes that, along with many other functions, perception and action are processes of inference in the brain (for a heuristic description, see **Figure 1**).

An advantage of using computational phenotypes to study psychopathology is that one is forced to give an explicit mathematical description of the dynamics of the pathological functions to phenotype the disorder (112) (e.g., the neurocognitive process underlying false perceptions, like delusions, and hallucinations). Computational phenotyping of this sort simply entails adjusting the priors of the generative model to maximize the likelihood of a particular subject's behavior or choices (121, 122). Generative models can further simulate psychophysics and neurophysiology (e.g., reaction times and neuromodulatory responses) associated with the hypothesized belief updating mechanisms underlying the pathological function (115). **Figure 1** provides a visual description of the way a generative model, or computational phenotype can be used to simulate and study perception and action and decision making under active inference.

Computational Phenotypes Beyond the Brain

Reflecting the longstanding interest in modeling neural circuitry, active inference is compatible with the aspirations of the RDoC and shares some of the RDoC's assumptions, namely: that pathology can be understood in terms of circuitry dynamics that adversely affect computational functions, which, typically, subserve adaptive behavior. Both the RDoC scheme and computational psychiatry borrow from a wealth of experimental work that delineates the different ways in which the brain's processing can go wrong. In recent years, in the hope of adopting a more ecosocial perspective on modeling human cognition, research under active inference has attempted to identify the computational-socio-cultural structure of mental disorders. This work has been cashed out in terms of theoretical models and simulation studies of organism-environment interactional behavior (123–129). Enlarging the scope of computational phenotyping, these studies have considered the manner in which organisms leverage their environment to support various cognitive functions and forms of social interaction (e.g., communication, social and situated learning, social conformity, cooperative decision making, joint action, joint attention, etc.) (108).

Conceptually, the ecosocial reading of computational phenotypes is licensed by the fact that the notion of phenotype encompasses levels that reach far beyond the brain (10, 106, 107, 130). For instance, a beaver dam is the product of the beaver's behavior. This behavior determines the beaver's survival and reproductive success; thereby becoming a target for selective processes. The ensuing combination of agents and their niche is known as an "extended" phenotype (131). An agent can also enter into a coalition (or conflict) with its biotic environment, thereby forming a "joint" phenotype, wherein no single party owns the phenotype, such as the health state of a parasite host (132), or, presumably, a shared, patterned cultural practice finessed through cultural evolution driving gene-culture co-evolution (50, 133). Ecosocial computational phenotypes rely on such an extended notion of phenotype to model systems beyond individual brains. This, of course, requires translating the ontology of Bayesian neurocomputation (e.g., prior likelihood and inference) to that of human ensembles.

The general idea behind this translation is simple. Just as the brain engages in inference by inverting a generative model of the cause of its sensations, the environment—and the agents it includes—can be regarded as inferring the cause of the sensory impression the environment receives. From the perspective of the environment, the sensory impressions are the agent's actions. Of course, such an anthropomorphic way of talking about the environment is only meant to set up the computational modeling. For instance, a chair may be viewed as providing a series of action

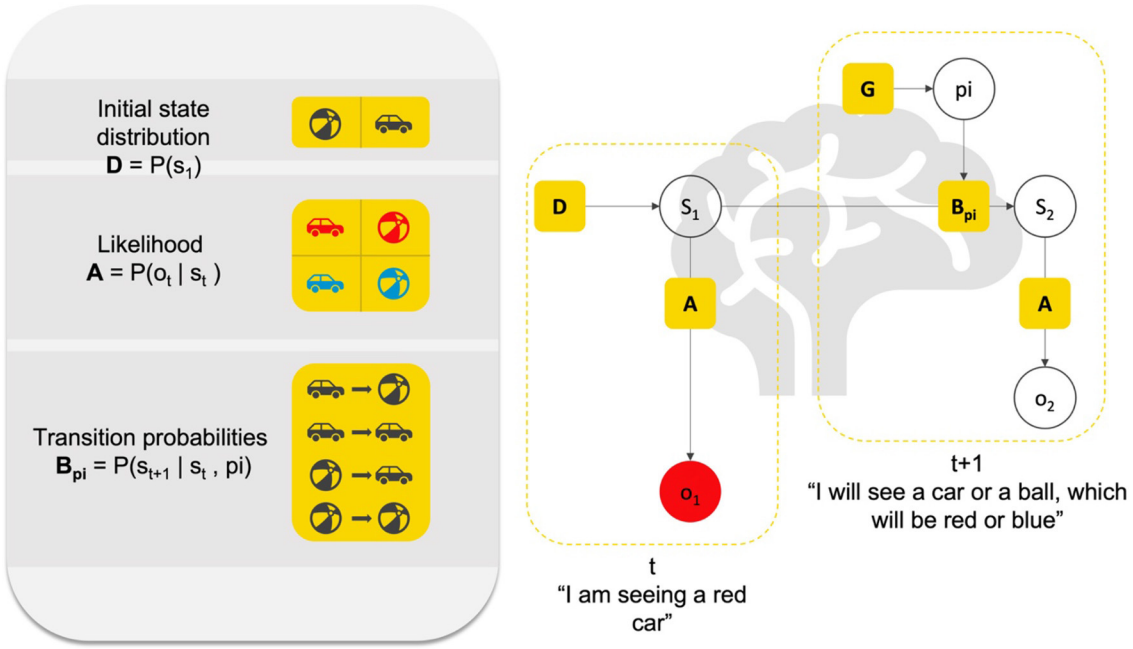

FIGURE 1 | Heuristic description of perception and action as inference. This figure presents a Bayesian graphical model of the relation between (priors and likelihood) parameters that constitute an elementary generative model for action and perception. Here, we can imagine an agent infers the cause "s" of its sensation "o" that it receives at time "1". This inference is based on a likelihood **A (P(ot|st))** about what generally causes red entries (e.g., is this a car or a ball?), and prior probabilistic knowledge about where the agent currently is in the world (e.g., am I facing a ball or a car?), or initial state **D (P(s1)).** Based on **A** and **D**, the agent can infer s1 (e.g., I am seeing a car). Then, assuming the agent acts based on its perception, it can further leverage knowledge about the dynamics of the world in which it exists, that is, of the transitions between different states of the world (e.g., ball to ball, ball to car, car to ball, etc.), which corresponds to probabilistic knowledge about transitions **B (P(st+1|st,pi)**). Based on **A**, **B**, and **D**, the agent can infer the possible courses of action "pi" to take and the future sensory outcome that it will experience (e.g., red; blue). Representations of causes in the world are hidden states denoted by "s", representations of allowable policies are denoted by "pi". Both must be inferred; hence they are in open white circles. Note that "o2" also has to be inferred, since policy selection (i.e., action) involves selecting the course of action toward future sensations. What is known to the agent are the parameters **A, B**, and **D**. Heuristically, perception (small L shape) rests on (implicitly) asking the question: "Given that I see 'red' (o1), and knowing that there is a prior probability **(D)** of cars and balls in this environment (e.g., open street), and knowing that both balls and cars can be 'red' with a given probability (likelihood **A**), did a car or a ball cause me to see 'red'?" The answer to that question is the inference in s1. In turn, action rests on asking the question: "Given what I am currently in s1, and knowing the probability of transitioning from s1 to another state (prior about transition **B**), and knowing the sort of course of action I can engage (policy pi), what course of action will lead to the most likely outcome in the future?". Inferring the current hidden state, the policy and future state and observation is done in a Bayes-optimal fashion, using something called Bayesian belief updating, which can be formulated in a neurobiologically plausible fashion. The inference is always Bayes-optimal; however, if, for instance, the truth about the world is that cars are never blue, and if the agent believes that there is a high probability that cars are blue, this may lead to false perceptual inference. In short, the agent must have the right priors to provide an optimal account of her sensed world.

possibilities [also known as *affordances* in ecological psychology (134, 135)], each of which yields different agent and context-dependent probabilities. A seat will have a greater probability to elicit the "sitability" action policy than the "standability" action in, say, a conference room. In this sense, the chair may be viewed as classifying the action "sit" under the category, or the cause for the "agent wanting to sit". These probabilities are consolidated by histories of agent-environment interactions (e.g., design and construction of the chair, the position of the chair in the room, etc.).

With such a perspective, one can make sense of the many cognitive functions the external world plays for an individual (136) and the manner in which typical and atypical cognition may constitutively depend upon those external functions (124). For instance, we know that perceptual cues guide the acquisition of many cognitive capacities central to normal functioning in social interaction. The production and coordination of perceptual cues such as gestures and uttered narratives guide joint attention during offspring caregiver interaction, and are known to support the acquisition of functions such as folk psychology (which allows a sort of "mind reading" of the states and intentions of others), autobiographical memory, and narrative practices (137–140). The failure of the acquisition of such functions is among the popular—although contentious—explanations of the social symptoms of autism (141, 142). By framing internal and external functions under a single joint phenotype, an ecosocial computational phenotype can explain in a principled fashion (i.e., based on Bayesian principles) the formal relationship between neurocomputational phenomena such as learning and attentional impairments [e.g., (143, 144)], ecological features such as perceptual cues (124), and culturally patterned looping dynamics (145), such as those that characterize

interactions between autistic individuals and clinicians or caregivers (97).

The inclusion of non-neural factors in theory driven modeling psychiatry allows one to explain the constitutive role of the environment in mind and cognition. This holds the promise of a mechanistic view of mental disorders that can include the computational role of social context and cultural factors. The same approach can be used to model the embodied nature of cognition: namely, the innermost ecology of mind being the brain in the body, which is embedded in the tool-using, interpersonally communicating individual who participates in a socially constructed (and populated) niche. The Evolutionary, Cultural, and Computational (ECC) model we consider next brings together the ecosocial reading of computational phenotypes presented above with the adaptationist rationale of evolutionary psychiatry.

EVOLUTIONARY CULTURAL AND COMPUTATIONAL PHENOTYPING

In the Section Evolution, Culture and Computation in Psychiatry, we reviewed the main motivations and principles of evolutionary, cultural, and computational psychiatry. Our aim was to familiarize the reader with the three approaches and their respective modes of explanation and modeling strategies (see summary **Table 1**). In this section, we pursue the integration of cultural and computational psychiatry by supplementing the notion of ecosocial computational phenotypes with an evolutionary interpretation of the structure of generative models. This furnishes an Evolutionary, Cultural, Computational (ECC) model of mental disorders. To illustrate how the ECC model might be applied, we will propose a reading of Major Depressive Disorder (MDD) that articulates the manner in which evolutionary and cultural factors can be integrated into a computational narrative to explain symptoms of MDD.

Before we continue, we should highlight an important distinction. Evolutionary and cultural approaches to psychopathology differ from computational psychiatry in that they both start with assumptions about the potential underlying causes of psychiatric phenomena, while the computational approach can remain agnostic[2]. Put another way, theories about psychiatric phenomena in evolutionary and cultural psychiatry aim to account for the specific etiological, phenomenological, and nosological relations between observed symptoms and their underlying causes—and associated syndromes—by drawing from specific accounts of human (pre)history, development, and current social contexts, whereas computational psychiatry can be used to model symptoms by incorporating a variety of possible underlying causes. In that sense, computational psychiatry constitutes a flexible method to analyze psychiatric disorders, rather than a substantive theory of their ontology or etiology.

The upshot of this is that computational psychiatry, or computational phenotyping under active inference, furnishes a way to integrate, within a single coherent and principled framework, a variety of theories about psychiatric phenomena. The ECC approach should not be viewed as a single implementable computational model, but rather, as a description of the variety of priors one could use to parameterize computational phenotypes that conform to the principles of evolutionary and cultural psychiatry. For a simulation study of such a computational phenotype see Constant et al. (16).

Evolution and Culture in ECC

Evolution in ECC

The ecosocial reading of computational phenotypes can be supplemented with an evolutionary interpretation. Internal priors of a generative model can be viewed as targets for selection; they can be studied as (epi)genetic, structural, or *adaptive priors* (146, 147). Adaptive priors are endowed by evolution and have been geared toward adapting the individual to the ancestral environment. They can be contrasted with (empirical) priors which are learned over developmental time *via* experience-dependent neuronal plasticity.

From a modeling perspective, the consequence of this is that adaptive priors will exert a strong top-down influence over empirical priors that can be learned, and thus over behavior and neurophysiology. For instance, our prior preferences for energy rich food can be viewed as an innate prior that will be paired with the learnt empirical prior beliefs about the probability of finding energetic resources in the current environment (148). Such an adaptationist rationale as applied to priors is useful for designing pathological generative models under the views of mismatch theory, constraints and trade-offs argued by evolutionary psychiatry.

Culture in ECC

With respect to culture, we have seen that those states external to the generative model—representing the environment, can be modeled in terms of priors and likelihoods, and thus the environment could itself be read as learning about its denizens. This view underwrites the ecosocial interpretation of computational phenotypes. Culture is defined as shared knowledge, practices, values, and institutions that constitute the way of life of a group of individuals or community (30). From a computational perspective, culture may thus be modeled as

[2]To the extent that computational modeling is based on a theory of how the brain works (or, at another systemic level how social interactions work), it may also make assumptions about causality. However, computational modeling can be used simply to provide a model of observed relationships (i.e., input/output mappings) with no presumption that the model describes the actual mechanisms mediating those relationships). When modeling attempts to describe how the brain actually works, the computational model will usually be underwritten by specific evolutionary or socio-cultural accounts of function which have direct consequences for and constraints on the model. The distinction overall is between computational models of the brain as specific ontological theories and computational models as a generic toolkit to capture dynamics that may be instantiated in diverse ways on different substrates. This is precisely one of the ongoing debates around active inference in modeling psychiatry. How much does such modeling assume or entail about the brain as opposed to simply being a flexible framework for (re)describing observed relationships? This is an open debate that we cannot settle here but we note that there are a range of possibilities related to the theoretical or empirical basis for structural relationships that are built into the computational model (rather than those than emerge by virtue of its dynamics).

TABLE 1 | Modes of explanation and modeling strategies.

Discipline and mode of explanation	Focus with respect to Wakefield's definition	Conception of mental disorders	Modeling strategy
Evolutionary psychiatry (selectionist account of function and Darwinian rationales)	The concept of dysfunction	Developmentally aggravated vulnerabilities understood as proximate causes shaped by ultimate causes	Darwinian rationales (cf. **Box 1**)
Cultural psychiatry (looping effects of human kinds, impact of self-construal, and ecosocial systemic models)	The concept of the harmful	Behavioral patterns causing psychological distress and functional impairment configured at the subjective level, and shaped by socionormative interactions, and cultural affordances	Ecosocial model
Computational psychiatry (active inference and ecosocial phenotyping in theory driven modeling psychiatry)	The concept of dysfunction; potential to model how harm and dysfunction interact	Suboptimal inference of perception and action caused by lesioned or atypically learned prior beliefs	Computational phenotyping

the calibration (viz. practice) between the priors, likelihood, and agents constituting the environment (viz. institutions) and the priors, likelihood and sensations making up the agents themselves (viz. knowledge and values) (108, 125, 129, 149–151).

The calibration of generative models is mediated by the exchange of sensory cues generated by the environment and actions generated by the agent. Over time, this exchange should attune the generative model of the agent to her environment (108, 126). Cultural models such as those construed by cultural psychiatry (i.e., the stable discursive and expressive styles of illness experience encoded in cognitive schema, practices, and social institutions) may thus be viewed as illness-specific calibrations of agents and their world's generative models, which consolidate through ecosocial looping dynamics.

Mechanism and Function in ECC

The ECC considers model parameters that reflect biological (and cultural) phenomena caused by proximal factors (e.g., mechanisms) and ultimate factors (e.g., adaptive functions). This distinction between proximate and ultimate factors, as discussed earlier, is one of the ways in which evolutionary psychiatry tries to understand "why evolution left us with traits that make us vulnerable to mental disorders." The taxonomy of priors described in this section—i.e., adaptive priors, vs. empirical and environmental or cultural ones—could be misconstrued as promoting a false dichotomy between proximate and ultimate causes: adaptive priors are meant to reflect the species' evolutionary history (its phylogeny), while empirical priors are meant to reflect the way an organism learns its environment over development (its ontogeny). This way of thinking is problematic, however, because it suggests an overly simplistic way to think about adaptation and development.

In particular, the notion of adaptive priors used here might be misread as meaning an "innate" prior, which is a controversial notion that certainly cannot cover many of the kinds of priors relevant to psychiatric disorders. In our model, adaptive priors are distinguished from purely learned, empirical or developmental priors. Historically, the folk concept of innateness has often conflated notions that reflect distinct and often irreconcilable biological realities (152). Those notions include (i) developmental fixity (i.e., the idea that an innate trait is "hard to change"), (ii) species nature (i.e., the idea that an innate trait is "universal"), and (iii) intended outcome (i.e., the idea that an innate trait is "there by design"). Appealing, either implicitly or explicitly, to such a folk essentialist way of thinking in science runs the risk of unjustifiably importing conclusions based on findings in one domain of biology into another disjoint domain (e.g., "because this trait is universal, it must be there by design, and because it is there by design, it will not change over development") (152). It is precisely these risks that the kind of computational phenotyping proposed here contends with, as it integrates model parameters that are meant to reflect "adaptive" vs. "learnable" traits.

The ECC, however, circumvents the problem of folk essentialism because the notion of an adaptive prior simply refers to a temporal scale of organization relative to a scale of interest. An adaptive prior is one that performs an evolutionary function [for a review of the notion of function, see: (153)] and for that reason, it is reliably transmitted to individuals from one generation to the next (e.g., the hierarchical structure and plasticity of the developing brain) (107). By contrast, an empirical prior is limited to (or learned during) the life span of the system of interest (e.g., a given connection pattern among neurons), and may not be passed on to subsequent generations. Of course, this implies that social systems or niches and cultural contexts that may have temporal duration beyond the life of an individual—and that are passed on exogenetically to the next generation—may also contribute scales of organization relevant to explaining psychopathology (50).

Thus, adaptive priors are typically "hard to change" (for example appear to be developmentally fixed) may simply be "slow to change"; hence, developmental fixity does not suppose a "species' nature", as that trait may change over phylogenetic time. Universality just refers to the fact that the adaptive prior will be spread across a population for a period extending beyond the individual life span of the members of that population. It denotes the phenotypic synchrony among individuals sharing the adaptive prior within a given (intergenerational) timeframe. Finally, the notion of "design" refers to the evolutionary function of the trait and is manifested by the top-down influence that the adaptive prior will exert on empirical priors (e.g.,

computationally, for one update at the adaptive level, there might be multiple updates at the empirical level).

At this juncture, it is worth noting that the ECC approach outlined here appeals to a multiscale model of the human brain, called "the hierarchically mechanistic mind", which explains cognition and behavior by integrating active inference with Tinbergen's four questions in biology (i.e., adaptation, phylogeny, ontogeny, and mechanism) (10, 107). According to this perspective, understanding the computational processes that underlie human action and perception requires an integrative approach that captures the evolutionary, developmental, and real-time dynamics that govern them. By incorporating both adaptive and empirical priors in a single modeling approach, the ECC presents an empirically viable avenue to help researchers unpack the complexities of Tinbergen's four questions. We suggest, therefore, that our modeling approach might not only be of interest to researchers in psychiatry, but also to those in the human and biological sciences more broadly.

Major Depressive Disorder Under the ECC

Common targets of computational phenotyping include schizophrenia (154), autism (155), and Major depressive disorder (MDD) (156, 157). Evolutionary (Darwinian) and cultural mechanistic explanations have already been proposed to account for the symptoms and syndrome of depression (15, 69).

Computational psychiatry models the core symptoms of MDD (e.g., diminished drive, loss of energy, and anhedonia) in terms of computational failings in the evaluation of long-term utility reward functions, a.k.a. the evaluation of *secondary utility* (156). Secondary utility relates to the value of stimuli whose reward causal structure is complex and spatiotemporally extended (e.g., the reward value of accumulating money). On the other hand, primary, biological, or "hedonic" utility—as opposed to secondary, "anticipatory" utility—relates to reward that is a proxy for reproductive success and survival (e.g., avoiding pain; seeking energy rich food) (156), thereby relating to adaptive priors and preferences that (under adaptationist assumptions) have increased reproductive success in the past. This is consistent with evolutionary approaches to mood disorder arguing for the adaptive value of low mood rather than MDD *per se* (15, 68, 69).

Pessimistic Priors

One computational pathway to understanding MDD as a dysfunction of long-term reward evaluation is the acquisition of pessimistic priors that entail biased learning of environmental states. The main function of priors—in a generative model—is to disambiguate the sensory information the system receives, in order to perform successful inference and select adaptive action. For instance, as per our problem of indirect perception, one cannot directly infer the mood of another person solely from the sensory information that person's face affords. Rather, one must take into account some high-level assumptions about the person's behavior over time (e.g., "she is usually a smiling person, but now her smile must mean something different because of what I said yesterday").

In other words, priors always bias the way we treat incoming information, and consequently, the way one selects action toward future sampling of the environment (e.g., "perhaps I should avoid talking to her as I'm sure she will reject me"). In MDD, priors biasing such model-based decision making are priors that tip the balance toward pessimistic inference, thereby leading to systematic pessimistic thoughts (a.k.a., a negative thinking bias (158). For instance, MDD patients form negative sentences more frequently and faster than healthy controls, when presented with optimistic and pessimistic options (e.g., in the scramble sentence test) (159, 160). As we will see next, pessimistic thoughts may interact with depressive rumination, and lead to the downward depressive spiral of negative expectations and self-evaluation, anhedonia, social withdrawal, and the suppression of reward-approach behavior characteristic of MDD. This is explained in terms of the autodidactic installation of pessimistic priors.

Reinforcing Pessimistic Priors

Many symptoms of depression are commonly experienced by healthy individuals and become a target for psychiatric MDD diagnosis only when they become enduring and lead to clinically significant functional impairment. Therefore, any account of depression should explain the maintenance of MDD symptoms over time. Another role of priors is to guide attention toward sensory cues deemed informative, given these same priors (161), a.k.a., *self-evidencing* (162). Explicitly engaged, or endogenous attention, for instance, can be viewed as a form of internal action (163–166) that assesses the relevance of information, sometimes in a biased fashion (167, 168). In MDD patients, aversive events invoke more recurrent and persistent cognitive processing. For instance, depressed patients gaze longer at negative stimuli: i.e., stimuli or information about negative outcomes (169) and spend more time examining them (170). They also report less positive emotion in response to positive images and more arousal to aversive images (171). Sustained endogenous attention over negative stimuli suggests that aversive events are considered informative, that is, disambiguating with respect to pessimistic priors (156).

Recurrent sampling of negative information necessarily entails reduced sampling of positive information (156); the sampling of information being one of the two ways in which one learns and update priors—our bias that drives appraisal of the world (the other being the pruning, or synaptic homeostasis, that underlies structure learning [see: (172, 173)]. Ongoing learning based on negative information is characteristic of the inability to inhibit rumination, defined as the tendency to focus on one's depressive state, along with the causes, meanings, and consequences of one's depression (174). Interestingly, rumination is often motivated by the belief that ruminating will bring insights into how to solve the cause of rumination (175).

The maintenance of MDD symptoms may be explained by the looping effect that underlies the autodidactic learning of pessimistic priors, when considered from the point of view of the computational machinery of the brain embedded in the social world. The loop is simple: pessimistic priors bias attention and learning, which biases active sampling toward rumination and exogenous negative information that confirm the pessimistic prior (i.e., self-evidences it), thereby leading to the consolidation of this pessimistic prior over time (i.e.,

minimization of uncertainty based on information that confirms the prior) (156). Exogenous negative information propagates in the social world through public discourse as depression becomes an increasingly popular diagnostic label, and characteristic idioms of distress are used by sufferers to frame their experience and guide their attention toward that which conforms to these idioms (176). In so doing, institutionally sanctioned negative exogenous information shapes the way one attends to one's own experience, body, and sensations, thereby reinforcing those priors' beliefs about one's illness.

Indeed, depressive patients are able to leverage and apply emotion regulation strategies to tackle their affliction when they are instructed to do so, but have difficulties selecting such strategies on their own (177). This speaks to the role of the social environment in the maintenance of MDD. It further speaks to the need to model computational looping effects of depression under ECC, not only in terms of learning and action selection dynamics in the generative model, but also in terms of environmental dynamics that feed back into learning to influence subsequent action selection.

Pessimistic Priors and Adaptive Priors

We have seen that one of the general mechanism that underwrites MDD may be the maintenance and reinforcement of a pessimistic prior. From a behavioral point of view, the sampling of negative information and rumination reinforces the pessimistic prior. In return, the pessimistic prior further orients the person toward actions that will sample negative information, which accounts for the downward spiral characteristic of MDD. From a cultural point of view, the spiral may be consolidated through pathological cognition. This process is driven by endogenous and exogenous attention: because of pessimistic beliefs, the person attends to negative stimuli, and in return, negative stimuli that confirms the pessimistic beliefs become increasingly available in her environment, social niche or cultural context. In effect, the diagnostic category becomes an organizing framework for experience that exerts its own effects in the cycles that constitute depressive cognition (176)[3]. Of course, this is not the only (or main effect) of culture, which also creates social-structural conditions of adversity and modes of adaptation that engender the vicious cycles of depression (178).

From an evolutionary point of view, given the survival value of being able to rapidly attend to potentially threatening information (179), the learning of a pessimistic prior can be further precipitated by a predisposition to seek negative stimuli, or evidence that will confirm the source of such pessimism. This predisposition can be modeled as a prior preference for the source of negative stimuli. This was demonstrated by Constant et al. (16) in a computational study of the pathogenesis of MDD. They simulated a "social" two-armed bandit scenario, in which the player had to decide which of two social partners to visit. Each partner afforded a level of reward from low to high, and an associated level of uncertainty over whether the visit would afford a high or a low reward. This setting was meant to reflect uncertainty in environmental contingencies, corresponding to the changing mood of social partners. At the outset, the synthetic agent performed the task adaptively and learned optimistic beliefs, until an adverse life event—that increased social volatility—perturbed social contingencies. Learned optimistic beliefs then shifted to pessimistic beliefs, as the agent kept receiving low reward when approaching social partners believed to afford high reward. As the simulation unfolded, expected utility went down, and eventually, the agents stopped engaging altogether, thereby evincing severe social withdrawal and low expected utility characteristic of MDD. Crucially, to reach the MDD state, the agent had to be endowed with a fixed prior preference for high social reward that would incentivize her to keep exposing herself to social partners, despite continued negative evidence (or outcomes). From an ECC point of view, the fixed prior preference played the role of an adaptive prior, which, under normal circumstances, fosters social interactions. However, under abnormal circumstances, for instance, when social volatility increases and persists, the same adaptive prior will generate behavior that engenders low mood and eventually MDD. Accordingly, the pathogenesis of MDD in Constant et al. (16) could be read under the mismatch rationale discussed above. Importantly, this computational study exemplifies our ECC approach by showing how evolutionary and empirical priors that reflect current social-cultural contexts can interact to produce generative models, characteristic of psychiatric disorder.

CONCLUDING REMARKS: TOWARD AN INTEGRATIVE SYSTEMIC VIEW OF MENTAL DISORDER

In this paper, we have entertained a trialogue between three approaches to psychiatry: evolutionary, cultural, and computational. We have focused on themes central to these approaches, such as adaptationist thinking, looping effects, and generative models in computational phenotyping. We have suggested a way to merge these perspectives under an Evolutionary Cultural Computational (ECC) model that characterizes the extended phenotype of the individual in context. The goal of this exercise was to exemplify an ecosocial computational model of mental disorders that harmonizes the constructs of evolutionary, cultural, and computational psychiatry, integrating their respective views into a systemic model.

While we believe the ECC approach provides a framework for integrating diverse perspectives in psychiatric theory and research, it has a number of important limitations. The ECC approach puts few constraints on theory building and an ECC computational model will only be as accurate as the evolutionary and cultural models that inform it. Computational models are technically challenging and require specific training to conduct analyses, which may not be part of the skill set of those with the requisite expertise in evolutionary or cultural psychiatry. As a method of building hypothetical models, the validity of ECC cannot be directly tested. Ultimately,

[3]This kind of looping effect provides a key illustration of how a social-cultural perspective enriches the evolutionary computational model.

its validity rests on its scientific and practical utility of generating new models, which make testable predictions. The performance of any one ECC model can be compared against competing models and real-world data to confirm or refute simulation outcomes. Translating computational models to psychiatric practice presents its own challenges, which might be met by developing diagnostic and assessment tools that allow practitioners to use client data to predict the course of illness in different social contexts or under different treatment conditions.

Despite those limitations, we believe that there are several ways in which the proposed ECC model can contribute to psychiatric theory, research, and practice. Active infererefinence models in computational psychiatry are meant to function as heuristic descriptions of the brain. Based on these heuristics, one can simulate pathological behavior and test, *in silico*, various interventions that mimic the effects of pharmacological agents, psychotherapy, social interventions, or other treatments on model parameters to examine the potential efficacy of this treatment to return the agent to "normal" functioning. Such modeling can suggest the sensitivity of illness trajectories to particular types of intervention and the potential interactions among multiple interventions.

Because the ECC model considers evolutionary and cultural parameters, *in silico* testing of an ECC model may provide new insights into the potential efficacy of interventions in more ecologically valid contexts [e.g., for a simulation study applying an ECC model to depression, see: (16)]. ECC phenotyping methods can be used to simulate specific kinds of suboptimal perceptual inference (e.g., the misinterpretation of a social partner's intention) that may be associated with psychiatric disorders by considering the influence of parameters reflecting the neural, developmental, evolutionary, and social dimensions of a phenotype. ECC phenotyping methods can also be used to identify clinically relevant phenotypes by fitting simulations to large datasets harvested from a range of different contexts, including: data drawn from interactions in shared environments such as social media platforms (which would reflect the manner in which people engage in a shared generative process); data drawn from psychophysics (e.g., eye tracking and response time data); and imaging or EEG data (which would reflect the impact of individuals' generative models on behavior). Using standard methods for Bayesian model comparison [e.g., Bayesian model reduction (180, 181)], researchers could compare ECC phenotypes in terms of their model evidence, each emphasizing different components of the phenotype.

Finally, returning to the problem of disciplinary boundaries discussed at the outset, the ECC model—understood as a multidisciplinary platform to integrate diverse approaches to psychiatric phenomena in the same computational model—could allow practitioners with various backgrounds to see how their perspectives can connect and converge; thereby enriching each other's ways of thinking about psychiatric disorders. Indeed, the goal of the ECC model is to allow researchers and clinicians to consider how phenomena like adaptation can contribute conceptually to an understanding of culture, and *vice versa*, that is, how cultural context and meaning shape the exigencies and outcomes of adaptation in health and illness. Clearly, the human mind involves highly complex processes that incorporate nested levels of organization and boundaries that reflect our cultural co-evolution and varied forms of social life. If we are to come to grips with the difficulties in adaptation and functioning that are the domain of psychiatry, we must develop tools that capture such complexities.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

AC wrote the first draft. PB, LK, and KF assisted each in turn in the revision and modification of the first draft. All authors contributed to the article and approved the submitted version.

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Enacting Metaphors in Systemic Collaborative Therapy

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What makes metaphors good therapeutic tools? In this paper, we provide an answer to this question by analyzing how metaphors work in systemic collaborative therapeutic practices. We look at the recent embodied, enactive and ecological proposals to metaphors, and provide our own, dialogical-enactive account, whereby metaphors are tools for enacting change in therapeutic dialogs. We highlight the role of enacting metaphors in therapy, which is concerned with how one uses the metaphors in shared process of communication. Our answer is that metaphors serve as good tools for connecting to action words, through which the client's embodiment and agency can be explored. To illustrate our view, we analyze two examples of enacting metaphors in therapeutic engagements with adolescents. Our enactive proposal to metaphors is different from others as it does not rely on engaging in explicit performances but stays within a linguistic dialog. We take metaphoric engagement as an act of participatory sense-making, unfolding in the interaction. This insight stems from enactive ways of thinking about language as a process accomplished by embodied agents in interaction, and seeing talking also as a form of doing.

Keywords: systemic therapy, enactivism, metaphors, embodiment, dialog

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INTRODUCTION

Metaphors are used often in many therapies, whether to explore the clients' problems, generate new insights, or to introduce a new outlook on their lives (see, e.g., Tay, 2013; Stoddard and Afari, 2014; Stilwell et al., 2021). Metaphors have also been an important tool for systemic collaborative therapists, who use it to explore their client's experiences and facilitate change (Anderson, 1997; Antoine, 2017).

But what makes metaphors good therapeutic tools? Classical conceptual theory of metaphor (Lakoff and Johnson, 1980, 1999) proposes that metaphoric thinking is based on conscious violation of established categories and mapping from source to target domains. Following this linguistic framework, metaphors allow for a "transfer of meaning," or thinking through one thing in terms of another. In this paper, we propose to answer this question from a different perspective, one of Embodied and Enactive Cognition (EEC) and systemic collaborative therapy. Embodied and enactive accounts of metaphors (Gallagher and Lindgren, 2015; Stilwell et al., 2021) ground metaphoric thinking in bodily and motoric processes, and propose that metaphors are enacted in ongoing physical interactions. The enactive approach in particular proposes a new way of thinking about metaphors. It steps away from the view of metaphors as linguistic

symbols that only "rename" one thing as another. Instead, it suggests that metaphors can emerge in participatory sense-making activities (De Jaegher and Di Paolo, 2007), act as means for further engagement, and should be treated as useful tools for interaction and communication (Rucińska et al., 2021). Furthermore, we highlight the idea that we can enact metaphors. Enacting metaphors is concerned with how one uses the words in shared process of communication. We will show that, importantly, it is not always the metaphor on its own that achieves the change in therapeutic context; it is the skillful use of the metaphor by the therapist that allows the metaphoric dialog to bring about new meanings and action possibilities. To contextualize our insights, we will show examples from systemic collaborative therapeutic practice. Systemic collaborative approach to psychotherapy already embraces the idea that psychotherapy is about creating a context in which therapist and his/her clients, in conversation, explore and co-construct new meanings together (Anderson, 1997; Rucińska and Reijmers, 2015).

Our enactive approach to metaphors is different from other recently available ones (Gallagher and Lindgren, 2015; Stilwell et al., 2021), which mostly focus on the bodily movements and performances involved in enacting metaphors, leaving an explanatory gap for speaking about enacting metaphors in dialog alone. We argue that metaphors can be enacted not just in play and in movement, but also in dialog, as talking is also a form of doing. As a result, we can enact different possibilities and find new senses or meanings in therapeutic conversation. In fact, a phrase need not even be a standing metaphor for one to enact it as such in dialog.

This paper proceeds as follows. In section "Systemic Collaborative Therapy Meets Embodied and Enactive Cognition," we introduce main tenets of systemic collaborative therapy and show how it fits with EEC. In section "Metaphors in Psychotherapy and Systemic Collaborative Practices," we discuss how metaphors are used in systemic collaborative practice, and in section "Embodied, Enactive and Ecological Metaphors," we clarify how EEC views metaphors. In section "How Do Metaphors Work?," we analyze how embodied, enacted, and ecological metaphors are supposed to work. In section "Enacting Metaphors in Dialog: Examples From the Therapeutic Practice", we illustrate what it means to enact metaphors in dialog with two examples from systemic therapeutic practice. In section "What Makes Metaphors Good Therapeutic Tools? An Analysis", we provide an analysis of what, in our view, makes metaphors good therapeutic tools. The gist of our proposal is that metaphors work best in therapeutic dialog when they are matched with action words. Action words allow the therapist to change the meaning of client-generated metaphors and lay the building blocks for his/her client to increasingly experience a sense of agency. Thus, the transformative character of metaphors in therapeutic encounters resides in their use, in so far as they can be linked to action words, enhancing, in this way, the agency of the client and promoting the co-construction of shared meanings (or participatory sense-making).[1] Section "Conclusion and Follow-Up" concludes the paper with insights about applicability of our proposal to other therapeutic contexts and provides insights for future work.

SYSTEMIC COLLABORATIVE THERAPY MEETS EMBODIED AND ENACTIVE COGNITION

A systemic approach to psychotherapy proposes that people are nodes in a complex network of relationships that affect them in their thinking, feeling, and doing; it focuses on the mutual and complex influences between the client and the networks in which he or she is interwoven (Bertrando, 2007). Contrary to what is often believed, systemic approaches to psychotherapy are not limited to working with couples or families: the systemic paradigm in which people are understood as nodes in networks of relationships allows working with individuals, couples, families, and groups (Boscolo and Betrando, 1996; Viou and Georgaca, 2019). Systemic collaborative therapy, as developed among others by Harlene Anderson, is one type of systemic therapy that specifically focuses on developing a collaborative relationship between the therapist and the individual, and engaging in dialogs that encourage growth and change. Systemic collaborative therapy emphasizes how social systems are linguistic systems (Anderson, 1997): it is through language, both spoken and unspoken, that people give meaning to themselves, others, and the world they live in Anderson and Goolishian (1992). The meanings that people co-create are socially constructed meanings—they take shape within dialogs and interactions (Rucińska and Reijmers, 2015), that are in turn influenced by, and must be situated within, broader social and cultural discourses. In the collaborative construction of stories and meanings, the therapist and the client strive for the client to experience a "relational sense of agency" (De Mol et al., 2018), which refers to how clients can once again experience they (can) make a difference in the networks of relationships in which they live. In the dialogical space that is created between the therapist and the client, the client can re-experience how he/she appears in relational contexts in a multitude of ways, and thus develop new perspectives on him/herself, the other, and the world.

This systemic perspective, informed by postmodern thought, also requires a critical look at the position of the therapist. In some therapeutic currents, the therapist is given the position of an expert: he or she can judge what is normal or pathological, what causes pathology, and what is needed to become healthy again. From a postmodern systemic perspective, however, the therapist is also a node in a network of relationships that influences how he or she gives meaning to what he or she perceives. His or her thinking, just like that of his or her clients, is socially constructed and therefore not more (or less) "true" than that of the client. The idea of the psychotherapist as an expert in the client's life is abandoned and there is a shift toward psychotherapy as co-construction (Gergen and Warhus, 2001). In this, the therapist's task is two-sided. On the one hand, he or she is responsible for creating a context

[1]Thanks to the anonymous reviewer for the helpful phrasing.

in which clients feel safe enough to share their stories. On the other hand, from a position of not-knowing (a position characterized by curiosity and reflexivity, whereby the therapist is open to learning about the client and does not assume he or she "knows" what the client's problem is too quickly), it is his or her task to facilitate a dialog in which new, more viable meanings can be generated (Rober, 2005; Anderson, 2012). Thus, the focus of the systemic therapist is not on "discovering" or "uncovering" experiences as such, but on the effect, the therapeutic dialog has on the client both inside and outside of the therapeutic room.

Although embodiment and non-verbal interactions have always taken central stage in systemic therapeutic practice (Jackson, 1957; Satir et al., 1991; Wilson et al., 2020),[2] recent theoretic developments with their focus on language and stories seem to have created a "gap" between systemic theory and its practice (Bertrando and Gilli, 2008).[3] We propose that this is where the EEC framework can be of help.

The Embodied and Enactive account of Cognition (EEC), two pillars of the "4E Cognitive Science"—see Newen et al. (2018), is an account that has a number of core concepts very much in line with systemic thinking, and so, could enrich systemic theory. EEC opposes classical cognitivist and computational views of cognition that reduce cognitive processes to manipulations of information in the brain. Cognition, it is argued, is grounded in broader perceptual and sensorimotor systems and develops in interaction with the environment. "Embodied" cognition refers to the idea that cognition is not limited to what happens in the brain but includes processes both in and outside of the brain. "Enactive" cognition refers to the idea that cognition involves more than just the body; it involves explicit, adaptive, and reciprocal interactions between the agent and its environment. Often EEC proposals include the notion of affordances from ecological psychology. Affordances are possibilities for action offered to an agent by the environment that emerge in their relation.

Perhaps unsurprisingly, body-oriented and art therapies have quickly found their way to this new approach to cognition as a foundation and inspiration for their practice (Röhricht et al., 2014; Samaritter and Payne, 2016). For therapeutic approaches that emphasize movement and non-verbal interaction, such an approach to cognition offers a ground on which to base the therapist's actions and clarify how therapeutic change takes place. But what about systemic collaborative therapy with its focus on language and dialog?

Here, we point out that EEC can extend to linguistic practices as well. Language, according to enactivists, is a stream of activity in a sociomaterial world of practices (Di Paolo et al., 2018). It is not a disembodied or decoupled activity of higher minds, but one that emerges in social interaction. Enactivists refer to the term languaging to talk about activities connected to language, including speaking, but also non-verbal behaviors like gesturing and mimicry. Languaging captures the "continuity between bodily engagements and activities including speaking and verbal behaviors" (Jensen, 2014, p. 6). Language is therefore a cultural process, grounded in human biology and sociomaterial practices that captures both the emotional and the affective dimension of human interactions. This allows systemic collaborative therapy to draw from EEC, as it finds support there to the idea that dialog is an embodied activity as well.

We will now briefly look at the role of metaphors in classical and systemic psychotherapies, followed by an analysis of what we can learn about metaphors from the EEC perspective.

METAPHORS IN PSYCHOTHERAPY AND SYSTEMIC COLLABORATIVE PRACTICES

In the psychotherapeutic literature, the term "metaphor" is usually given a very broad meaning. Metaphor simply refers to "a way of speaking in which one thing is expressed in terms of another" (Kopp, 1971, p. 28). Reflection on the role of metaphors in psychotherapy has a long and rich tradition (see, e.g., Tay, 2013). In an attempt to structure the multitude of ways in which metaphors can influence therapeutic processes, Lyddon et al. (2001) proposed the following classification: (1) relationship building between therapist and client, (2) accessing and symbolizing client's emotion, (3) uncovering and challenging client's tacit assumptions, (4) working with client's resistance, and (5) introducing new frames of reference.

According to Tay (2016), the literature on the use and role of metaphors in therapeutic processes shows two main trends: a therapist-centered approach and a client-centered approach. In a therapist-centered approach, the focus is on the therapist as the author of the metaphor. It examines and describes what the therapist needs to be attentive to in devising metaphors, bringing metaphors into dialog with their clients, and using metaphors in therapeutic processes. Some therapeutic movements see in the layering of metaphors an opportunity for therapists to communicate indirectly to the client's subconscious and thus avoiding conscious resistance (Erickson and Rossi, 1976; Roffman, 2008; Burns, 2012). However, the literature also describes ways in which metaphors are used more explicitly. Metaphors offer therapists a way of discussing often abstract hypotheses, ideas, or advice with clients in a concrete manner (Lakoff and Johnson, 1980; Tay, 2013, 2017). In an attempt to support therapists in this, there are manuals that provide numerous metaphors that

[2]For example, Jackson (1957) emphasized the importance of paying attention to the analogue aspects of communication, such as breath, tone of voice, and bodily movements; Satir et al. (1991) emphasized the importance of "experiencing" during therapeutic conversations and invited family members to sculpt their relationships through their bodies. And more recently, Wilson et al. (2020) emphasise how systemic therapy is first and foremost about enactment, or a performance, that is created between all the participants.

[3]Bertrando and Gilli (2008) note that there is a gap between, on the one hand, systemic theory's focus on language and stories, and on the other hand, systemic practice with its attention to the effect these stories have on the bodily experiences of the client. They describe how the narrow focus on language and dialogue in systemic theory building and its "growing tendency (…) to emphasize words and narration, obscuring the relevance of body interaction" (Bertrando and Gilli, 2008, p. 368) has had an effect of creating the so-called "disembodied dialogues": dialogues focused on the content of what is said that they underemphasize embodied experiences and non-verbal interactions.

can be used by therapists when they deem it useful or necessary (Blenkiron, 2011; Stoddard and Afari, 2014).

The literature from a client-centered approach to metaphors focuses primarily on the client as the author of the metaphor. This approach is in line with more non-directive approaches within psychotherapy and sees metaphors as means for clients to verbalize what they think, feel, and experience (Lakoff and Johnson, 1980; McMullen, 1996). The focus is mainly on the content of the metaphor, as the therapist interprets the client's metaphor from his or her own frame of reference. The metaphor is thus seen as a gateway to uncover psychopathology (Rhodes and Jakes, 2004; Coll-Florit et al., 2021) or unconscious thoughts and feelings (Borbely, 2008). However, a more process-oriented approach, like systemic collaborative therapy, emphasizes the importance of bracketing one's own interpretations and adhering as much as possible to the client's process and meaning making (Kopp and Craw, 1998; Sims, 2003; Rucińska et al., 2021). From the systemic collaborative therapeutic perspective, metaphors can be generated by both the client and the therapist (Rober, 1999). Regardless of who generates the metaphor, the metaphor serves to co-construct new stories. The metaphor in itself does not conceal any "truth," nor is it intended to convey "knowledge" or "insights," but can offer an approach to investigate experiences from a different perspective.

Although metaphors are an integral part of psychotherapeutic practice and a great deal of research has been conducted and written about the role of metaphors in psychotherapeutic processes over the years, Tay (2017) is concerned about how little attention is paid to how contemporary metaphor theory can enrich psychotherapeutic practice. This inspired us to ask: what is it about metaphors that makes them good therapeutic tools? Our answer to this question will be situated within the EEC approaches to metaphor—particularly the enactivist approach, which sees metaphors as tools for joint meaning-making practices. To understand the processes of meaning-making in metaphoric engagements, we now turn to EEC, which sees metaphors as embodied, enacted, or ecological, and discuss how it can enrich and underpin the use of client-generated metaphors in systemic collaborative therapy.[4]

EMBODIED, ENACTIVE, AND ECOLOGICAL METAPHORS

In the philosophical literature, metaphor is typically seen as a literary device that involves conscious violation of established categories, allowing us to understand one kind of thing (often abstract or unfamiliar) in terms of another (more concrete and familiar; Lakoff and Johnson, 1980; Stilwell et al., 2021). Recently, however, metaphors are no longer treated as linguistic entities (figures of speech) or linguistic processes (source-target mappings) alone but are seen as cognitive and imaginative processes (Gibbs, 2006), perceptual processes (Szokolszky, 2019), or even as affordances and figures of action (Jensen and Greve, 2019). For instance, the dynamic view of metaphor (Müller and Tag, 2010) proposes a dynamic intertwining of social, cognitive, and affective processes in metaphor production and understanding, and systematically integrates social and cognitive processes for the analysis of metaphor activation in conversational interaction. In this paper, we do not aim to provide a comprehensive overview of all of the available proposals on how to think of metaphors. We will, however, provide a brief characterization of some of the most recent embodied, enactive, and ecological (Machielsen, 2019; Szokolszky, 2019; Stilwell et al., 2021) approaches to metaphor, so as to situate our own, dialogical-enactive approach to metaphor use in therapy.[5]

We will start with the claim that metaphors are embodied—an idea so popular that it should not be controversial. But what exactly does it mean for the metaphor to be embodied? The literature on metaphors refers to different senses of embodiment, which is worthwhile mapping out. By saying that "metaphors are embodied," one could, in the least, mean one of the following things: metaphors have sensorimotor roots, rely on motoric simulations, require activation of physical circuits in the motor cortex, or involve affective bodily processes—and this list is not exhaustive. We will try to unpack some of these different meanings at play.

For instance, the concept of "embodied metaphor" can refer to the fact that existing metaphors have bodily roots, as seen in the examples of Lakoff (2008, 2012) and Lakoff and Johnson (1999). They propose that while metaphors are linguistic tokens, the language that people have developed is grounded in their physical experiences, and conceptual metaphors can build on embodied experiences. According to Lakoff (2008), all complex conceptual metaphors can be decomposed into primary metaphors, and primary metaphors are acquired "by going about the world constantly moving and perceiving" (Lakoff and Johnson, 1999, p. 57). For instance, "AFFECTION is WARMTH" is a primary metaphor, whereby we associate physical warmth with friendliness. This is so, according to Lakoff, "(b)ecause primary metaphors are persistent (long-lasting or permanent) physical circuits in the brain" (Lakoff, 2012, p. 782, see also Kompa, 2017, p. 203).

However, sometimes our body not only serves as a grounding for metaphoric thought, but also seems to serve as reference for understanding creative and unique language use. Metaphors trigger bodily responses which enable us to "experience" the meaning of a metaphor. For instance, according to Raymond Gibbs (2006), to understand metaphors containing an action verb is to actively imagine oneself engaging in that very action.

[4]We note that while we think that our insights about metaphors are not just specific to systemic collaborative therapy and could be applied to other therapies, there are two main reasons why we stick to systemic collaborative therapy. One, the systemic therapeutic context is a better context for enacting metaphors, as in systemic therapy, we do not use metaphors to uncover meanings, but to create them. Two, enacting metaphors in typical talking therapies where the focus is still on "uncovering meanings" can yield opposite results than the ones we find beneficial from our perspective. We will return to this below.

[5]In this paper, we will not draw on the technical distinction between a metaphor, a simile, or an analogy. These distinctions are not relevant to make our argument: even if it turned out that some of our examples are not *stricte* about metaphors but should be linguistically classified as similes or analogies, our insights are just as relevant for therapeutic contexts.

And according to Littlemore (2019), embodied metaphor is characterized by a visceral bodily experience used to describe something abstract. Embodied metaphors can have a strong physical association or elicit strong physical reactions. Here, "embodied" is used to describe situations when one has an overt, physical response to words.

According to Littlemore (2019), metaphors differ in the degree to which they are embodied. There are metaphors that elicit a neurological response, there are metaphors that can appeal to our experiences with, and our knowledge about, our bodies, and there are metaphors that can also be understood because they are part of our language or convention, as they grew from the history of our embodied experiences and interactions. The sense of embodiment that we wish to emphasize, however, is that there is an explicit role for the body in shaping metaphor understanding, connected to enaction: occurrent bodily movement and activity. We will now turn to the enactive proposal.

We take Gallagher and Lindgren (2015) as providing a good example of an enactivist take to metaphors. As they write,

> The term enactive here signifies not a different kind of metaphor per se but a different kind of engagement with metaphor. Specifically, we can say that an enactive metaphor is one that we enact—that is, one that we put into action or one that we bring into existence through our action (p. 392).

They contrast enactive metaphors to sitting metaphors (ones found when reading a book, which are "sitting" on the page and waiting for the reader to discover them). Instead, enactive metaphors "do things, but only when we engage with them in some fashion" (*ibid.*, p. 392). Their focus is on how we can put metaphors to work in actual learning situations and provide an example of enacting metaphors in specific contexts.[6] Enactivist proposal, in short, is that metaphors are achieved in participatory action, their meanings are created in the interaction, and they are a part of joint construction of a new reality (Rucińska and Reijmers, 2015).

From the ecological approach, Jensen and Greve (2019) propose a somewhat similar account of metaphors as a products of organism-environment systems. They see metaphoric engagement as "a form of doing that is embedded in the ways that we do things in the world, and as such it can be understood as skillful manipulations of environments of any kind" (p. 2). They propose to thinks of metaphors through the concept of affordances, which has the advantage of helping us "to focus on metaphor as part of our active doings, rather than as inner mental processes or stylistic features" (p. 12–13). They further speak of levels of metaphoricity of words, to contrast the idea that literal and figurative meanings are sharply distinguishable. They propose that

> metaphoricity needs to be seen as a scalar value; something that is more or less activated or present (…). Notably, metaphoricity is not restricted to (the meaning of) words or verbal actions but [relies] on a variety of bodily activities and sensations (2019, p. 10).

Both enactivist and ecological proposals notice that the metaphoric meanings come about in interactions. Enactivists argue that we construe our meanings through participatory sense-making, an idea that meaning is jointly achieved through a history of breakdowns and recoveries in interactive coordination (De Jaegher and Di Paolo, 2007). We actively, in an ongoing fashion, make sense of our environments: we engage in interactive processes of bringing forth or enacting of a world of relevance. Ecological take to metaphors as affordances allows metaphors to be part of such meaning-making practices.

The embodied-enactive-ecological proposals underlie the view on metaphors that we share. Where our proposal differs from the rest is in thinking about how it is that enacting metaphors actually brings about change. We now turn to an analysis of how EEC metaphors are supposed to work, followed by our proposal of enacting metaphors in therapeutic dialog.

HOW DO METAPHORS WORK?

We have spelled out above what the gist of the embodied, enactive, and ecological take to metaphors is. But that is not yet sufficient to explain how metaphors work, or what it is about being embodied, enacted, or ecological that allows metaphors to provide us with new meanings. In this section, we attempt to provide a short overview of how metaphors are supposed to work on the embodied, enactive, and ecological models, each analysis followed by a critique or worry pertaining to that method. We then propose to fill a gap in the available explanations with our own proposal.

One way in which metaphors are said to work is because they allow us to see similarities between two entities that are normally considered distinct (Szokolszky, 2006, 2019). This is a skill that, from a representational lens, is a complicated cognitive task (Norbury, 2005).[7] But it can be well accounted for by ecological psychology. Ecological psychologists speak of direct pick-up of an invariant pattern in an informational array specific to both the source of the metaphor and its target (for example, the informational array specific to both fireworks and flowers that allows one to metaphorically consider

[6]The context they consider is pretend playing that one is a meteor to learn about their trajectories and associated concepts from physics. They describe an experiment whereby children learned about trajectories of meteors by "embodying it" in pretense, such as by running and jumping, and explicit navigation of the space around them. In the context of the game, the children's running had a metaphoric nature, as the running enacted the movement of the meteor. Pretend play involves a metaphoric transformation where one *acts-as-if* one thing is another, and it is precisely in this action that the banana (target) is a phone (source).

[7]For instance, being able to see similarities between two distinct objects is characterized by Norbury (2005) as "a complex developmental process that requires the acquisition of a number of skills [such as] broad enough semantic representations to capture the comparison being made" (p. 384). Norbury thinks that deciding in what respects two objects are similar involves thinking through the mappings from source to target domain with the use of "analogical reasoning skills" (2005, p. 385).

fireworks as "flowers on the sky").[8] According to Agnes Szokolszky (2006), prototypical metaphor is based on a clearly perceivable shared resemblance (and/or "shared affordances") between two objects. Finding a resemblance lies the ground for a metaphor as it creates a possibility to perceive one thing in terms of another (e.g., a shoe in terms of the boat), and in turn, to say something metaphorically. This view roots the capacity to act on metaphors in simple perceptual, not complex cognitive processes, such as counterfactual thinking or being able to represent one thing as another. So while metaphor was believed to presuppose classification skills not available to the preschool child, the ecological perspective considers metaphors as learning tools that even young children can develop, because from the ecological perspective, metaphoricity is a perceptual phenomenon.

While stepping away from over-intellectualizing the mechanisms underlying metaphoric engagements is something we share with the ecological approach, we think that metaphor sources and targets do not need to share structural similarities, and resemble one another in any way. Many metaphors are conceptual (e.g., "love is a battlefield") and do not allow for any perceptual informational patterns to be picked up on. And sharing of affordances is much too broad of a claim, as metaphor sources and targets can share an infinite number of affordances (possibilities for action), such as possibility for discourse. This is not something that makes the perceptual view special in explaining how metaphors work, at least, not in systemic collaborative therapeutic context. Also, while ecological psychologists can say that they only speak of prototypical, not conceptual metaphors, there is another issue at hand: passivity of this approach. In therapy, the stress is on the active role of dynamic action and interaction in relation to affordances for metaphoric discourse. The act of simply seeing resemblances between the metaphor and its source, or being mindful of the bodily origins of metaphors, is not enough. In our proposal, we will focus on acting on metaphors. In this respect, we do not see metaphoricity as requiring perception of resemblances or perception of "shared affordances," but we propose to think of metaphors as tools for new ways of seeing and interacting.

Another way embodied metaphors are said to work is because they refer to our personal, lived experiences (e.g., Littlemore, 2019). These metaphors are based on experienced correlations between the source and target domains, and not on perceived similarities. Experienced correlations refer to our past embodied lived experiences and feelings, thereby being more likely to neurologically trigger us when we hear them.

One concern with the claim that metaphors are grounded in bodily experiences is that it seems to suggest that these metaphors would trigger personalized, individual understandings, as each metaphor is based on one's own, individual, embodied experience. This would face the worry that the metaphors would not be understandable to others. However, this view is not a problem if combined with enactivism and participatory sense-making. Participatory sense-making is partially grounded in our bodily experiences, but mainly, it suggests that meaning-making is a joint act, one that develops intersubjectively. Our social interactions change how we perceive and understand the world. No individual person chooses their own meanings of experiences; experiences become meaningful in interaction with the others, negotiated within a cultural practice. What this means in practice is that the meaning of a metaphor is flexible and takes shape within the context in which it is used. One and the same metaphor could even be "reused," as we will show below. We build on this insight to discuss how metaphors get their meanings in the context of a therapeutic dialog in the next section.

Yet another way embodied metaphors are said to work is because they trigger sensorimotor responses, as captured by some of the embodied proposals (Schaefer et al., 2015; see also Kompa, 2017). Here, the source and the target of the metaphor need not be alike in any structural way; what happens is an activation of the brain regions that would also be activated should we actually experience what is expressed in the metaphor. Kompa (2017) happens to call this "simulation," even though he refers to sensory-motor processes involved in the re-enactment of an embodied experience.[9] Consider explanation of Kompa (2017) of how metaphors work by simulation:

> So the idea, basically, is that in order to understand a linguistic expression one has to simulate the corresponding experience. When I hear the word "grasp" I simulate (reenact) the action of grasping. And since I have grasped before, I will be successful and come to understand the word in question. Simulation, in turn, requires activation in sensory and motor (as well as affective) regions of the brain because in simulating a particular experience we exhibit roughly the same pattern of neural activity that accompanied the initial experience. Language comprehension crucially involves recruitment of the sensory-motor system (p. 196–197).

We agree with the claim that language comprehension is a sensory-motor endeavor. There is a multitude of evidence from neuro- and cognitive science to support this, including the fact that some action verbs elicit activation of motor cortex in the brain (Barsalou, 1999; Hauk et al., 2004).[10] However, Kompa (2017) argues that simulation (as described above) fails in accounting for metaphor understanding because it "provides us with a theory of literal interpretation. But

[8]"At the heart of metaphor is the direct pick-up of (resonance to) an invariant pattern in an informational array that is specific to both the topic and the vehicle (such as, for flowers and fireworks, invariants that specify progressive expansion from a central point). In this way, metaphor, as other forms of knowing, relies on a fundamentally perceptual process" (Szokolszky, 2006, p. 87).

[9]Such broad characterization of simulation does not commit one to Simulation Theory that is representational.

[10]As discussed by Kompa, "there are fMRI-studies that show that processing verbs, which denote actions performed by hand (pick, grasp), foot (kick) or mouth (lick) elicits activation in the motor (and premotor) cortex (in a somato-topically organized manner)" (2017, p. 197).

interpreting metaphors requires that we leave the literal meaning behind (…). Understanding metaphors requires that one looks at things differently than one did before" (p. 206). Consider the metaphor "to GRASP an IDEA." Is activation of the same neurons when one actually grasps a cup that which allows us to understand the metaphor in question? Kompa challenges this, arguing that simulating (or in EEC terms, *reenacting*) our previous bodily experiences, by means of activating the related sensorimotor processes of grasping when thinking about the metaphor "to GRASP an IDEA," does not yet get us to understand its metaphoricity.

While Kompa's challenge should be analyzed in more detail in the future, we suggest that for therapeutic purposes, the idea of mere activation of sensorimotor circuits connected to action words during speaking of those words is indeed not central, as it is not in the triggering of sensorimotor processes (such as the sensorimotor activation of hand-grasping) that the enacting of the metaphor takes place—it is in the dialog. If we were to work with the metaphor "to GRASP an IDEA" in systemic therapy, it would work as a metaphor because grasping activity is connected to the wider network of meanings we can associate and create with the action word "to grasp," such as a feeling of achievement or the emotion of success. In our view, it is what one can do with the metaphor to bring about change that makes the metaphor work, as we will explain below.

Thus, while there are several pathways through which metaphors can work, each way tailored to its own context,[11] we will focus on idea of Gallagher and Lindgren (2015) that metaphors work because they are enacted: they invite us to "act out their understandings with [our] bodies" (p. 398), instead of thinking through the mappings from source to target domains. As Gallagher and Lindgren note, enactive metaphors are not a different type of metaphors—the difference lies in how we use them. Enactivism can thereby propose a different way of looking at how metaphors can be put to action, in dialog, which we think is most productive for a therapeutic context.

We endorse this enactivist approach to enacting metaphors and are sympathetic to the abovementioned enactivist proposals. However, one limitation of the available proposals is that they treat enaction rather literally. Gallagher and Lindgren (2015) speak of enacting metaphors in acts that are embodied performances of pretense: it is in the moving of one's body that the actors are acting metaphorically. Jensen and Greve (2019) say that enacting happens "in-and-through the gestural movements" (p. 18).[12] And most recently, Stilwell et al. (2021) discuss enacting metaphors of pain in therapy and propose that the metaphor is enacted when manual pressure is applied by the therapist to the patient's pain source. Not before, not after, but in the touching is when the metaphors were enacted.[13] In all of these examples, the metaphor is literally performed, with movement, gesture, or physical touching. Stilwell et al. even explicitly contrast enactive metaphors to verbal metaphors; the latter are seen as part of "passive patient education" (p. 243). This is a rather limited view of enacting, as enactivism extends to language as well. So while we agree that sometimes this is how we can enact metaphors (just as we can explicitly enact our imaginings in performances of pretend play—see Rucińska and Gallagher, 2021), our point in this paper, and the adjustment to the available enactive views of metaphor, is that enacting of metaphors can also happen in the talking, as talking is also a kind of a doing. We propose that no explicit performance aside linguistic verbalization needs to take place for the metaphor to still be enacted, for language is also an embodied and enactive process. In the next section, we clarify how we think enacting metaphors works in dialog.

ENACTING METAPHORS IN DIALOG: EXAMPLES FROM THE THERAPEUTIC PRACTICE

Following the analysis above, we propose that in systemic therapy, we can enact metaphors in dialog. What this means is that, in a therapeutic context, a therapist can use action words and verbs associated to the metaphor to bring about new action possibilities for the client who introduces the metaphor. The therapist does not need to analyze the meaning of the metaphor; he or she creates new meanings with the metaphor as introduced by the client to make together new sense of the client's situation.

Take, for instance, talking about depression. Such diagnosis, on its own, does not warrant new behaviors. The narrative of "depression" is static and often restrictive: once diagnosed with it, it can have a debilitating effect on a person (one does not know what to do about it but accept its consequences). But when a client seeks therapy in order to cope with his/her depression, it could be helpful for the client and the therapist to speak with metaphors. This could work, because action-oriented verbs can be easily associated with such metaphors. The therapist can skillfully engage and play with metaphors (more than with clinical diagnostic words) to bring about new conversations with the client. We will show this in the example below.

Our point for now is that metaphors allow for a transformative experience when they are enacted in dialog. But that enaction needs not be a bodily performance. Conceived of as linguistic affordances, or possibilities for future actions enabled by language,

[11]For instance, a therapeutic context might require a different kind of metaphors than ones required for learning a skill; for the latter, see Abrahamson (2020).

[12]They give an example of making "long sweeping movements from the left to the right and back again" (p. 19) to enact the concept of a "bridge."

[13]"These metaphors became enactive through clinician-patient interaction; we observed dynamic sense-making unfold between clinicians and patients when clinicians *touched patients* in the areas of their back where they were experiencing pain, as well as the surrounding areas. As the clinicians *applied manual pressure to tissues*, it was brought to patients' attention when muscles were perceived by the clinician to be knotted, tight or ropey" (Stilwell et al., 2021, p. 239, emphasis added).

metaphors are dependent on use. Metaphors in therapy can function as objects or tools for manipulation. So while metaphors could work due to their symbolic properties, we want to highlight another way metaphors work that has not been discussed in detail before, which is that they work when they act as linguistic affordances for action. To act as linguistic affordances for action means that they open up new ways of languaging, talking about, and making sense of things.[14] Below, we will provide two examples from the systemic therapeutic encounters to illustrate our point.

Case One: Andy

Andy is 15 years old and has been struggling with a morbid form of obesity for several years. His parents divorced when he was 10 years old. He remembers how, shortly after the divorce, he started eating more and more. Eating, he says, offered a form of comfort. His mother was on her own after the divorce. In order to cope financially with the new situation, she worked long hours. Therefore, Andy was often home alone. Initially, Andy was not really bothered by the weight he was progressively gaining. However, this changed with the transition to secondary school. There, he was bullied and excluded because of his weight. Young people hurled words at him such as "elephant" and "fatty." He became increasingly ashamed of his appearance and locked himself up in his room. He hid behind the computer and joined an online community of gamers. His unhealthy eating habits and sedentary lifestyle led him to develop morbid obesity. Any hope of change faded away like snow in the sun. He felt trapped in his own body and powerless over his situation. It became increasingly difficult for him to go to school and endure the looks of other young people. When Andy was 14 years old, his mother suggested he seek help from a medical pediatric rehabilitation center where obese youngsters receive multidisciplinary residential treatment to help them re-establish healthy eating and living habits and regain their self-confidence. It took a year before Andy dared to take the step.

During one of his conversations with Andy (A), his therapist (T) explores the way in which the looks of others have affected him.

> *T: I remember from one of our previous conversations that you were often excluded and bullied at school. Despite that difficult situation, you continued to go to school. How did you do that?*
> *A: Over time, I [put on] a harness. That harness helped me cope with all those words. It was the only thing I could do against all those ugly things people said to me.*
> *T: So you put a harness on as a way of protecting yourself? Is that right?*

Notice how Andy spontaneously uses a metaphor to respond to the therapist's question. The metaphor is not chosen randomly. Andy is a gamer and plays games in which a harness is often used to protect your avatar against a dangerous virtual world. His experiences with gaming offer him an arsenal of images from which he can pick and choose in order to express his experiences in the conversation with the therapist.

The therapist wants to further explore, from the not-knowing position, Andy's experiences of going to school. He decides to do so by "staying with" the metaphor that Andy has given him (by continuing to use and to explore it) and asks Andy further questions:

> *T: When you are wearing your harness, do you no longer feel the [weight of the hurtful] words?*
> *A: Yes, but just a bit. If you are hit [by those words], you still feel the blow. [With the harness] it just feels less painful.*
> *T: OK, so you still feel the blow of the words, but it is muffled.*
> *A: Yes, indeed.*
> *T: And what was it like for you to have to walk around with such harness?*
> *A: I locked myself up in my room as much as possible so that I didn't have to see anyone. That way I didn't have to put on my harness.*
> *T: And why was that exactly? What was it like for you to have to walk around with such a harness on?*
> *A: It was very tiring to have to keep it on all the time. It took a lot of energy not to let people see how I felt inside. Even though it varied from day to day.*
> *T: Oh yes, and what did that [variety] have to do with?*
> *A: Partly [it was] because of the number of beatings I had to endure. And at the end of a school week, the harness also felt much heavier than at the beginning of the week.*

From a therapeutic perspective, we could say that Andy uses the image of a "harness" as a metaphor for his struggle to shield himself from painful experiences. He uses the metaphor as a mean of expressing how he coped with the bullying. The concrete image of the harness helps him put into words the complexity of his experiences. However, from an enactive perspective, the metaphor provides a "shared space of affordances" (Gallagher, 2020, p. 113), within which Andy and his therapist can move to further explore his experiences. Because a harness is something tangible and concrete, both Andy and the therapist can refer to the multisensory aspects connected to using or wearing a harness to illuminate Andy's experiences. Harnesses can be taken off and put on; they can be heavy or light (this can vary from day to day or moment to moment); and they can absorb the blows from outside, though some blows may still feel harder than others.

Through his questions about the harness (how it feels, or what actions it allows), the therapist invites Andy to go beyond a static comparison. Andy's experiences of bullying are contextualized and differentiated within the language of the metaphor. In and through this metaphoric dialog, a noticeable shift in meaning takes place. In contextualizing and differentiating, Andy increasingly appears to the therapist as a young man who has worked hard to hold his own in a

[14]Thanks to the anonymous reviewer for helpful wording.

"battlefield" of remarks and hurtful words. He is not just a "harnessed" young man, hiding behind a shield. He is a young man who puts on "an armor," takes blows and braves fatigue. Where the metaphor initially afforded hiding, now it also affords resisting and fighting back. By shifting the focus from a static comparison to a dynamic exploration, the therapist laid the building blocks for Andy to increasingly see and experience himself as a young man who acts, interacts, and makes choices—a young man with agency. This is also tangible in the following excerpt:

T: I hear you talk about how you had to take blows and how tiring it was to wear a harness. And yet it took you a year to take the step to our center. Could you help me understand that?
A: I took the step only after it became too tiring to wear the armor.
T: And why not before?
A: I thought I could keep the armor on. When I felt that was no longer feasible, I took the step to the center.
T: So you only took the step to our center when you felt you could no longer keep it on. What perseverance!
A: Maybe (laughs).

In working with metaphors from a systemic collaborative perspective, the therapist is careful not to analyze the metaphor but rather to create a space in which clients can share and explore their experiences in such a way that new facets of their experiences can be approached and illuminated from a different perspective. In the excerpt, the therapist highlights Andy's perseverance in carrying the weight of the harness, and thus invites Andy to reconsider his experiences from a different perspective. Andy seems to accept the proposal and creates a space to generate new stories about himself together with his therapist.

After an exploration of what helped Andy to show that perseverance, in the next excerpt, the therapist invites Andy to explore what has changed since the start of the obesity rehabilitation program. Notice how the therapist again poses his starting question in such a way that it invites Andy to talk about himself as someone with agency, someone who makes choices and takes well-considered actions.

T: At some point you took that step [of coming to the therapy]. And then? What did you do with the harness?
A: I kept the harness on for the first few months. When I got to know the group better, I took it off so they could see more of who I really am.
T: Did your experiences with the group give you the courage to take off the harness?
A: Yes.
T: And what did you notice that made you confident that you could take off the harness?
A: I felt at home in the group. I felt that I did not have to focus on how I came across and that I could just do as I did at home. I felt that I did not have to pretend to be someone I am not.
T: And could you tell me more about taking off the armor? How did it go?
A: It was piece by piece.
T: Piece by piece? And what helped you to take off the next piece after each one?
A: I just noticed that nothing much changed. Everyone kept looking at me in the same way and continued to deal with me in the same way.
T: And that gave you the confidence to take off your harness piece by piece?
A: Yes
T: And now, where is your harness now?
A: It is hanging on the coat rack. Gathering dust. You never know when I might need it again.
T: (Laughs). So you haven't thrown it away yet?
A: No.

Initially, the therapist created a conversational space in which Andy could talk about his experiences in taking the blows and carrying the weight of the harness. The focus was on Andy's burden. As the conversation progressed, the therapist shifted to a more action-oriented exploration. He invites Andy to talk about what Andy has "done" with the harness and why. The focus of the therapist is now on what Andy has experienced and the way he has responded to it as an active participant in the event. The therapist's questions invite Andy to explore the way he handled his situation as somebody who critically evaluates and makes informed choices. He chose "putting on a harness" in order to defend himself, he chose to wait with an admission to the rehabilitation program, and when he could no longer continue by himself, he chose to "leave the harness on" in the first few months, after which he decided to gradually "take the harness off," piece by piece. The action-oriented questions invited Andy to no longer see himself as someone who just suffered, but also as someone who handled the situation the best way he could.

Although the therapist deliberately chose his questions and "scaffolded the conversation" (White, 2007), he did not unilaterally determine which direction the conversation would take and which meanings could be drawn to the foreground. Within the context of the therapy, the conversation was a process of participatory sense-making in which both participants influenced how the conversation proceeded. By means of an enactive metaphor, Andy and the therapist co-created new storylines in which Andy appears as an active participant in the various nodes of relationships in which he is entangled. Inspired by this newly found relational sense of agency, it hopefully encourages him to re-position himself differently in the various nodes of relationships in which he is entangled: not just as a victim of bullying, but also as a courageous and powerful person.

Case Two: Ben

Ben is a 17-year-old young man with autism. He struggles with negative thoughts. The struggle does not always show on the outside—it takes place "in his head." The negative thoughts do not let go of him. During one of the conversations, Ben tells the therapist about his self-injurious behavior:

sometimes, when he is having a really hard time, Ben cuts himself. He tells the therapist how, when he is having such a hard time, he feels both the need to be left alone and he wants to be helped. Just before he cuts himself, the feeling of being left alone dominates. After he has cut himself, he realizes that he needs help. Only, he does not know how people could help him.

The therapist is curious about this shift in experience and asks Ben what happens after he cuts himself that he feels the need to be helped. Ben tells the therapist how cutting helps him to let his thoughts come out. When his head is overflowing, he cuts himself. And at that moment, he realizes he needs help. The therapist tells Ben how striking he finds the fact that the cutting brings about a shift in his experiences, from a need to be left alone, to a need to be helped. Ben acknowledges this, but initially finds it difficult to put into words what exactly makes that shift happen. After a short silence, Ben suddenly says as:

B: It is like with tattoos. If you are against tattoos, you find them a form of self-mutilation. But if you like tattoos, a tattoo can be seen as a story that you carve into your body. The cutting works for me like a tattoo works for [them].
T: I hear you use the word "story." A tattoo is a story that is told. (…) And what is the story behind your tattoos?
B: One big story of the last two years.
T: And does it have a title?
B: I do not know if I could give it a title.
(…)
T: Can I ask you a strange question? Let's say we would meet again in a year and you put a tattoo over your scars? What kind of tattoo would you choose? What form would it have?
B: That is a difficult question. I think I would put an image of a skeleton in a dinner jacket dancing a slow dance with an ordinary lady. In fact, that might also be the title of my story.
T: The skeleton in a dinner jacket slow dancing with a lady?
B: Yes.
T: Ok, and what is the story behind that tattoo?
B: The lady could be anyone who self-mutilates for one reason or another. And she slow-dances with death. Because you never know when you cut too deep.
T: Why did you choose a lady?
B: Because I see myself as the skeleton rather than the lady. At times I feel very close to death.
T: It says something about how close you are or were to death?
B: That's why it is a slow dance, because at times I feel so close.
(…)
T: So in a year's time that tattoo would be a story of how close you were to death, and how intimate that dance was at the time. And perhaps how brave you were too?
B: Yes, probably.

While discussing the metaphor of the tattoo, the therapist made some choices in what questions he asked and which ones he left out. The questions he asked were informed by his therapeutic hypotheses as well as by Ben's answers. Working with the "tattoo" metaphor initiated by Ben, the therapist could have continued the discussion in many action-oriented ways. For instance, the metaphor could have been used to posit different kinds of questions pertaining to agency, such as: "Is the tattoo a finished product?," "What colors will it have in a year?," "How visible could you make it for the outside world?," or "Will you cover it up or leave it visible?" Such questions open up the space for Ben to think about his future. Even though "tattoo" is a noun, and it is most easily attributable to Ben's scars, the therapist has the tools to push the meaning of the metaphor further, to induce in Ben thoughts about taking control and acting in the future. Working with the metaphor of a tattoo gives the therapist the room to explore possibilities for action that are not available, when one receives, in similar circumstance, a diagnosis such as, e.g., "Ben is depressed."

How do these two examples relate to enactivist idea of sense-making? In Andy's case, talking about the "harness" helped him put into words the complexity of his experience and allowed a new sort of conversation to unfold, one that helped Andy make new sense of his hurtful experiences together with the therapist. Similarly, in Ben's case, talking about the "tattoo" allowed him to feel understood, as it allowed for the conversation to go forward with the therapist, where they made new sense of his situation together. The value of both metaphors is that they paved the way toward different conversations and in turn, allowed gaining new perspectives on one's problems—perspectives that, thanks to action-oriented discussions that followed, allowed both Andy and Ben to feel in control over their problems. We will elaborate on these added values of enacting metaphors below.

WHAT MAKES METAPHORS GOOD THERAPEUTIC TOOLS? AN ANALYSIS

From our dialogical-enactive perspective, metaphors are good therapeutic tools not because they uncover experiences, but because they allow sharing and changing those experiences. Talking of "uncovering experiences" is problematic in our view, because it suggests that there are hidden truths that can be uncovered with the metaphor, truths that were somehow "repressed" and are now brought to the surface. So while it is possible that one gains new insight from enacting metaphors, this is not the goal of systemic collaborative therapy, as the new insight should be seen as yet another perspective the client can take on their problem. We see metaphors as tools that afford the therapist different possibilities for making the client feel understood. They are also good for exploring client experiences and bringing new ideas to the foreground. Metaphors affords telling new, different stories, and in the questions a therapist asks, he/she can bring forth in the client experiences of agency. Finally, metaphors function as lenses through which the client, after the therapy, can approach and experience the outside world.

How do the metaphors do that on our picture? In short, metaphors work when they are skillfully oriented toward actions in dialog. The metaphors that Andy and Ben shared were oriented toward action by the therapist. And even though their metaphors were nouns, the systemic-enactive approach utilized by the therapist made him focus on possible actions associated with these nouns. Harness is something one can use to hide behind or to fight with. Tattoo is something one can color, draw, or with which one can tell a story. From the systemic-enactive perspective, any metaphor (even "sitting" metaphors) can be traced to an action. The content of the original metaphor is not as important as what one does with the metaphor. The best way to bring about change is through action words, through which the therapist can bring about change when he invites the client to collaboratively do something with the metaphor.

Why does enacting metaphors with action words work in psychotherapy? To repeat, it affords the client and the therapist ways to explore experiences in such a way that the clients can feel heard and understood, communicate how they think or feel, and be invited to explore their agency—and not just help the client provide an insight on their condition. While clarity is important, from the systemic perspective, insight is not enough for progress (as Watzlawick, 2009 famously said, "insight may cause blindness"). Also, the choice of the metaphor, by itself, does not lead to a transformative experience. Making an analogy to capture one's experiences in itself is not sufficient, for it is not the metaphor itself (thanks to its symbolic or embodied properties) that does the work, but how the metaphor is used and responded to (or enacted) in an interaction. On our view, it is the communicative act with the metaphor that becomes a transformative experience for the clients. The metaphor has to be received by another, accepted, and acted upon in return. Metaphors work best when they are part of collaborative engagement.

Take the example of Ben, who has used the tattoo metaphor to talk about his struggles. We noticed that when Ben used the same metaphor to talk to his mother, he felt not understood. From our perspective that is because without his mother picking up on the metaphor in their conversations or in any way acting on that metaphor, the communication between them stops, and the engagement does not result in a transformative experience for Ben. However, the metaphor does work with the therapist, who uses it to further the discussion. To the systemic therapist, metaphor is a vehicle for change.

In short, metaphors themselves do not do the heavy lifting. It is important what one does with the metaphor, not what the metaphor means. It is how the therapist enacts metaphors by discovering action words that allows the client to move beyond the metaphor that makes the metaphor therapeutically useful. Consider for contrast the Big Book of ATC metaphors (Stoddard and Afari, 2014) that proposes to provide an "exhaustive list of metaphors" geared toward treating various conditions, ranging from anxiety, depression, trauma, or an eating disorder. We oppose the idea that finding the "right" metaphor will help one solve his/her problem.

Finally, focusing on action words allows the client to regain a sense of agency. When metaphors are discussed with action words, a therapist can choose to elaborate the metaphor with questions that a client, in answering them, can regain a sense of influence over his or her life. We see sense of agency as more than just knowledge over the kind of influence one has; it is an embodied experience of being able to act, to do, to move, and to change. Metaphoric engagements can offer the possibility to explore one's experiences in a way that one can feel that change is possible. As the therapist wants to give his/her clients the feeling of having a grip on what they are struggling with outside of the therapeutic room, the hope is that the sense of agency will stay with the client after the therapy ends and translate into coping in everyday life.

CONCLUSION AND FOLLOW-UP

To summarize, we have presented in this paper a proposal for seeing metaphors as tools for action in systemic collaborative therapeutic context. We have argued for the view that metaphors work best when they are enacted, and that engaging in explicit movements or performances is not the only ways to enact metaphors. Metaphors can also be enacted and jointly explored in dialog. As the intention of the systemic collaborative therapist is to bring new experiences for the client, metaphors are useful resources for systemic collaborative therapists, when they are enacted with action words. Enacting metaphors allows bringing forth new perspectives and a sense of agency in their clients, because the therapist dynamically co-constructs the metaphor with the client and uses action words to jointly create new meanings. Thus, our answer to the question "what makes metaphors good therapeutic tools?" is that they can be connected to action words, through which the client's embodiment and agency can be explored.

While our analysis is based on the collaborative systemic approach to psychotherapy, we are convinced that other therapeutic models can also be inspired by it. An important condition, however, is that the focus of the therapy is not on discovering or exposing "fixed," "hidden," or "repressed" meanings, but on creatively co-creating more liveable realities, which is why not all talking therapies may benefit from our intervention strategy.[15]

We will share three practical insights that follow from our proposal. First, on our view, one does not need to work with a culturally established metaphor: any word will do. The therapist should keep an open eye for words that afford enactive metaphoric explorations. For example, it is by using regular words (such as "tattoo" or "shield") and exploring action words connected

[15]For instance, enacting metaphors in therapies where the focus is still on "uncovering meanings" can yield opposite results than the ones we find beneficial from this intervention method (which is bringing about the client's sense of agency). For instance, it is possible to enact metaphors by focusing on action words connected to those metaphors to uncover more "hidden truths" about a client. One would do that by focusing on action words that deepen the original understanding of the metaphor (e.g., focusing on the heaviness of carrying a "harness"). But that would only reinforce the client in the old meanings (e.g., harness as a representation of the weight of bullying) and not yield new perspectives for the client, which ultimately, is the added value of our approach.

to them that progress can be made. Second, we are mindful of the fact that at times, working with existing metaphors can even be harmful, especially when their literal or simplistic interpretations are taken up by patients or therapists. For example, Stilwell et al. (2021) notice that the use of linear structural metaphors (such as: pain is a "knot," body is a "machine," or one does not have "core stability") may limit a person's ability to understand their condition, as it suggests to the patient that the cause of their persistent pain is, e.g., "simply a muscle knot, rather than a complex experience" (p. 6). It is therefore important for the therapist to be sensitive to the effects a metaphor (and its co-construction) can have on a client. Third, while at times it is useful to explore the metaphor to its fullest, the therapist should also know when to let it go. The therapist should maximize the metaphor, and when it is no longer useful, let go of it, so that the client can focus on new experiences going further in life. One should not be "hooked" on the metaphors that are successful but see them as tools. Once they are used successfully (their meaning co-constructed with a client, allowing him/her to find a new perspective), it should be left aside, so that it does not constrain the client going forward.[16]

We can therefore further inquire about the role of metaphors in our proposal. If using action words is what brings about the relevant change, why do not we simply apply action words to any words, but metaphors? Could not we just focus on introducing many action words in a therapeutic dialog, or use action words on diagnostic words, without finding a metaphor first? What is special about enacting metaphors?

To provide an answer to this question, it is useful again to remember the embodied qualities of metaphors as discussed within the EEC perspective. Firstly, metaphors have embodied roots that can be explored. They afford talking about multi-sensorial aspects of our experiences (Abrahamson, 2020). Once the embodied roots and sensorial aspects of metaphors are discovered, it is easier to find action words to explore those metaphors further. Secondly, metaphors refer to a network of meanings. They can trigger associations made in different contexts and allow us to apply them to a present context. For instance, source objects of metaphors (harness and tattoo) are embedded in different practices and doings (literature, movies, or everyday life), which affords talking in new ways about the target: the therapist can tap into our shared experiences and cultural narratives to do with shields and tattoos to find relevant action words that can be used to further the conversation. Metaphors thereby help the therapist tap into the dialog, and find many action words, to deepen the conversational topic. Finally, some metaphors might work better than regular words, because they allow concrete sensorimotor visualizations. For instance, in a therapeutic dialog, a systemic therapist can invite his client to convert their statement into an image and draw the client's attention to their implicit phenomenological modalities (somatic, proprioceptive, and kinesthetic).[17] Take as an example the words "helpless" and "powerless" (Fondelli and Rucińska, 2021). While they seem interchangeable in a conversation, these words allow us to imagine being in different situations. Being helpless can be imagined as being without anyone around on whom one can rely (one is alone in the imagining). Being powerless can be imagined as not being able to influence someone who is there (one is not alone in the imagining). These imaginings, in turn, invite different action words. Thus, once one visualizes how the body is placed in those relations, new action words with new action possibilities can emerge. The enactive account to imagination, which proposes that imaginings are deeply rooted in bodily experiences and affects (Rucińska and Gallagher, 2021) can further clarify how new bodily experiences can come about with imagining.

To repeat, in our view, it is not what the metaphor says, but what one can do with the metaphor to bring about a sense of agency, that makes the metaphor work. As was our message all along, in different contexts and interactions, the meanings of metaphors can change with use.

DATA AVAILABILITY STATEMENT

The data analyzed in this study is subject to the following licenses/restrictions: The data presented in this study are available on request from the second author. The data are not publicly available due to privacy or ethical problem. Requests to access these datasets should be directed to TF, thomas.fondelli@telenet.be.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Informed consent was obtained from the subjects involved in the therapeutic encounter and their legal guardian/next of kin for the publication of any potentially identifiable images or data included in this article.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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[16]Consider a useful analogy from Abrahamson (2020) on how a music teacher of cello uses a metaphor "grasp it like a strawberry" to convey what the learner's grip should be like (gentle, as if one was afraid to squish a strawberry). Once the student learns the grip to find for oneself a musical flow, the metaphor has served its purpose and should be let go. The student should no longer think of the metaphor of a strawberry when playing, but focus on the new musical experiences, and affordances for playing, that the mastering of the grip has allowed.

[17]According to Abrahamson (2020), metaphor understanding, and capacity to learn from metaphors lies in the emergence of "multiple sensory modalities tacitly springing forth [in the enactment of the metaphor], including the visual, auditory, kinesthetic, proprioceptive, and somatic" (p. 216).

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Integration and Causality in Enactive Approaches to Psychiatry

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In this paper I address what has been called the integration problem in psychiatry. This problem is tied to conceptions of causality and explanatory levels in our understanding of mind. I take an interdisciplinary enactive perspective to develop a 3-fold method for exploring the dynamics of integration, based on a concept of dynamical causation and a non-hierarchical (level-free) notion of gestalt. I also consider Autism Spectrum Disorder (ASD) as a test case.

Keywords: integration, psychiatry, autism spectrum disorder, causality, levels

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THE INTEGRATION PROBLEM IN PSYCHIATRY

The integration problem concerns how to understand the coupling or interaction among all of the diverse processes that may be involved in psychiatric disorders (1–4). The processes that need to be integrated, for example, genetic, neuronal, psychological, social and cultural processes, are commonly said to be on different levels or involve different scales. Integrative accounts of psychiatric disorders can be narrow or wide, depending on the range of processes or factors included. For example, Gerrans (2), in his book on delusions, proposes a relatively narrow account of the "cognitive architecture" of delusions by integrating neuronal and phenomenological elements, with narrative generated in the brain's default mode network[1]. Gerrans, treating the cognitive system as an information processing one, invokes hierarchical arrangements of (top-down) predictive processing (requiring reference states for comparison between higher and lower levels), combined with a mainly bottom-up neural network theory. He also pursues an explanatory strategy in terms of causal relevance, appealing to new mechanist models (5), and Woodward's (6) interventionist view of causality. One version of the integration problem, then, is to understand how to adjudicate among multiple explanations or disciplines [see (7) for a recent attempt to address this problem].

The challenge for Gerran's account is precisely how to integrate these different models—all of which depend on the concept of levels. To be clear, the issues is not just about integrating cognitive/narrative, personal/experiential, and sub-personal/neurological levels, but also integrating the different conceptions of levels involved in the various theories and models to which Gerrans appeals. He admits this is a problem.

> The notion of levels is ubiquitous, but not everyone uses it in the same way. It can refer to ordering relationships between theories…; the objects of theories ordered by size or complexity, e.g., cells are smaller and less complex than the organs they make up; functional analyzes, e.g., vision is a higher-level property than edge detection; or levels of mereological containment,

[1]The term "narrow" (vs. "wide") is a term of art in philosophy of mind, signifying cognitive processes that are in the intra-cranial mind, the brain, or "in the head." "Wide" signifies the involvement of extra-neural, embodied and ecological processes. To be clear, my concern is to address a wide conception of integration which is not reducible to the kind of neural integration that one finds, e.g., in Panksepp and Northoff (8).

> e.g., parts are at a lower level than wholes. These uses can overlap. The notion of level relevant to [Gerrran's analysis] is that of mechanism. Higher levels correspond to the organization of components, lower levels to components [(2), p. 229–230].

The mechanist view, however, where levels are mereologically defined, may not match up with hierarchical arrangements defined by predictive processing, which specifies reference state comparators between higher and lower levels.

Another example can be found in phenomenological psychiatry. Sass et al. (4), drawing on both phenomenology and Engel's (9) biopsychosocial model, proposes a bio-pheno-social integrative account: Bio (genetics; neural) + phenomenology + social factors. Sass's account involves a wide integration insofar as he includes social factors. Sass worries about how to explain the relations among the various "component processes." Are they arranged in a hierarchical fashion; are they causal or constitutive? Sass finds his analysis entangled in the theoretical framework of levels, and he remains pessimistic.

> [These] questions pertain to theoretical issues that are difficult or even impossible to settle, such as overall attitudes toward holistic explanation or the enigmatic mind/body problem (generally viewed as utterly insoluble)" [(4), p. 725]

The proliferation of different levels and different kinds of levels has motivated even theorists who often employ the notion of levels to add some qualifications and to move away from the concept of hierarchy, especially in the context of understanding psychiatric disorders. Eronen [(10), p. 929], for example, makes this point in the context of psychopathology.

> [D]ifferences in time scales could be used to define levels, but scales are continuous, where the boundary between levels should be drawn may not have a clear answer.… The upshot is that defining levels in psychopathology is far from straightforward. The exact levels and their significance can vary strongly from context to context. In psychology, it is often unclear how part-whole or scale-based levels should be understood in the first place. This suggests that levels in psychopathology are best seen as heuristic idealizations that are helpful in making rough distinctions, but do not mark deep ontological features of the world.

It's possible to develop explanations that are not based on hierarchical levels. Bechtel (11), for instance, develops a mechanist view that favors a heterarchical set of neural control mechanisms, rejecting a hierarchical organization in favor of lateral constraints within a network that "does not impose any requirement of hierarchical organization" [(11), p. 31]. Likewise, Woodward (12), commenting on Eronen's "levels eliminativism"—"the thought that we would be better off avoiding level talk entirely"—suggests it is motivated by the fact that researchers operate with different conceptions of levels without always distinguishing them. Woodward, however, endorses the concept of levels suggesting it continues to do some useful work in science. After discussing several different types of levels, he focuses on an interactionist conception, closely tied to the role of different spatial, temporal, or energetic scales in constructing causal models. Different scales matter specifically as they relate to the "strength and nature" of causal interactions. In this respect, it's clear that differences in scales are doing some of the explanatory work. As he puts it, "sometimes when nature is kind" we have relatively clean distinctions between scales, "so that what happens at one length of energy scale can be understood largely independently of what happens at other scales, and this in turn leads us to think of interactions at one scale as at a different level than interactions at other scales" [(12), p. 429]. The concept of scales, however, is different from the concept of levels. Craver and Darden [(13), p. 162ff], for example, assume this distinction in their discussion of integration. They distinguish between levels of products, levels of units, levels of causation, levels of composition, levels of mechanisms, etc. Differences in time scales, in contrast, involve differences in how we measure processes.

The ideas of a heterarchical set of causal relations, involving reciprocal control processes, framed in terms of different temporal and spatial scales could take up some of the explanatory slack if we were to give up hierarchical level explanations. In contrast to hierarchical level-based explanations in psychiatry, de Haan (1) offers an alternative enactive model of wide integration based on what she calls "organizational causality." Not unlike the bio-pheno-social model, it includes phenomenological, social and neurobiological processes. De Haan importantly adds an "existential" dimension—the idea that the person is reflectively aware of her own situation and can take an evaluative attitude toward it. She argues that discussions of reciprocal or circular causality found in some enactivist models (14–16), to the extent that they still depend on the notion of levels, continue to present the temptation of reductionism. Moreover, questions about how one level is causally related to another tend to frame the analysis in dyadic rather than holistic terms. For example, Fuchs writes: "mental illnesses are marked by a disruption of vertical circular causality; that is, the interplay between lower-level processes and higher faculties of the organism" [(14), p. 331]. On this view, circular causality just is a form of reciprocal, downward and upward relations between parts and whole [(15); also see (17)]. In a psychiatric context, although more than two elements may be involved in a more complex pattern of causality that can be circular, the pattern can also involve multiple, non-linear or indirect interactions across different time scales. De Haan argues organizational causality allows us to move away from the idea of levels—so causal relations are neither bottom-up nor top-down; rather, they can involve a heterarchical set of relations organized more holistically.

What is organizational causality? Instead of involving levels or hierarchical arrangements, de Haan associates organizational causality with the idea of emergence as fusion. On this point De Haan follows Humphreys (18): "when emergence occurs the lower-level property instances go out of existence in producing the higher-level emergent instances." To explain emergence as fusion de Haan offers the analogy of a cake, where all of the ingredients, even if they start out as differentiated, once baked, become fused in such a way that one can no longer distinguish sugar from flour from flavorings, etc. This is, of course, a cake

without layers. I agree that the right conception of causality can lead to a better solution than the ambiguous mix of levels noted in the theories discussed above. The concept of fusion, however, is unhelpful in the psychiatric context since, even if we bracket the talk of "levels," as de Haan wants to do, the various processes or factors that constitute the psychiatric context do not go out of existence, nor do they fuse to the point where we cannot discriminate among processes that are clearly affective or clearly cognitive, or clearly social, etc. even if such processes are dynamically integrated. In psychiatric practice we need a model of integration that does not subvert useful distinctions among the neurobiological, the phenomenological, the social and the existential, to use de Haan's own list of perspectives.

De Haan indicates that the point she wants to defend is that "we can no longer assume that parts or processes still have the same properties once they have become part of a whole" (private correspondence). As she puts it in her book: "the parts or processes prior to this configuration are thus not the same as the parts or processes after this configuration: their relational structure carves out different "abilities" and "inabilities" than they had before, either in isolation or as part of a different constellation" (p. 116). I agree, but the notion of fusion does not capture this idea. With the idea of fusion, we go from a confused mishmash of levels (as noted by Gerrans), to a situation in which, not only levels, but all useful distinctions disappear.[2]

This still leaves the problem of integration—the problem of understanding how the diverse processes involved in our everyday existence, that can go awry in psychiatric disorders, are related or coupled. What we need is a solution that eschews the idea of levels, and the accompanying temptation of reductionism [see (10, 19)], but still leaves intact important distinctions among different contributing factors. In terms of the etiology of psychiatric disorders, for example, it is not clear that neuronal processes are necessarily more basic than social processes, or that affective processes are at a lower level than cognitive processes. Yet we still need to discriminate affect from cognitive processes, and neuronal from social processes, even if we do not want to think of them as operating on different levels, and even if they are in some way causally integrated or meshed or transformed. Even if an individual's affective life changes by means of narrative therapy, for example, neither affect nor narrative go out of existence to form something else. We can acknowledge with de Haan that processes involved in psychiatric disorders change as they mesh with other changing processes, but this is not a fusion into indistinguishable processes. Indeed, when de Haan discusses psychiatric diagnosis and treatment, she reverts to the concept of complex patterns, framed in terms of network models [(1), p. 244ff].

Although de Haan's term "organizational causality" works well here, to avoid the idea of emergence as fusion I'll refer to the idea of *dynamical causality*, where in some cases relations are non-linear, and transformational, but lead to neither hierarchical arrangements nor fusion. Instead of fusion, we can think of processes that involve dynamical transformations. When one factor comes into a dynamical causal relation with another factor, both factors may be transformed or changed, but they do not disappear in the process. This describes a dynamical gestalt—a set of distinguishable processes that are dynamically related, but are not defined as on different levels. Although one usually thinks of a gestalt as involving a whole that is more than the sum of its parts, a dynamical gestalt, rather than constituted in part-whole relations, is constituted in the dynamical causal relations among the processes forming a particular pattern. In the case of dynamical causality an intervention above a certain threshold may result in changes to one or more factors, directly or indirectly, serially or in parallel, and include looping effects, all of which depend on parameters of flexibility in the gestalt relations.

A 3-PART METHOD TO THIS MADNESS

If the integration problem is not solved in Gerrans' (narrow) or Sass's (wide) hierarchical level model, and if we have reasons to doubt that de Haan's fusion model will work in this context, then the idea of a dynamical gestalt offers an alternative way of addressing the integration problem. For purposes of characterizing a gestalt, it is not enough to simply list the relevant factors or processes; rather, we need to say specifically how all of the factors relate (20–22). To be clear, the idea that there are dynamical connections among the various factors and processes of the gestalt is part of its definition. In this regard, the concept of gestalt at stake comes close to Kelso's (23) notion of dynamical pattern. The relevant notion of causality is non-linear/dynamical causality rather than reciprocal, circular, or organizational causality (understood in terms of fusion). The question, however, is what this means in the context of psychiatry.

This idea is not entirely new. The concept of gestalt has played an important role in phenomenological psychiatry. Thus, for example, Jaspers states:

> All research differentiates, separates and studies individual particulars in which it tries to discover certain general laws. Yet all these individual particulars are taken out from what is in reality a complex unity. In grasping particulars, we make a mistake if we forget the comprehensive whole in which and through which they exist. This never becomes the direct object of our study, but only does so *via* the particulars. [. . .] We can state the following in relation to it: the whole comes before its parts; the whole is not the sum of its parts. . . it is form [(24), p. 28–29. 504].

[2]This is a pragmatic objection about the use of the notion of emergence as fusion in psychiatric contexts. There is more to say about the theoretical explanation of emergence as fusion as found in Humphreys and de Haan. As one reviewer points out, the concept of levels may indeed be implicit in the concept of emergence, and even explicit in the explanation of emergence as Humphreys and de Haan use it. Humphreys, for example, as evident in the quotation above, still refers to higher-level and lower-level properties. It is also implicit in the standard concept of gestalt, where one might consider the whole to be at a higher level than the parts. I agree there is something misleading about this. One might argue that if the ingredients or properties "at the lower level" go out of existence, then there is no lower level—it gets subsumed into the "higher level"—one is left with a whole without parts, or a system where the level distinction is not relevant. This is de Haan's analogy with the cake. It's not clear that the ingredients are still there—they have been chemically transformed as they are fused into the cake. Humphreys indicates that the lower-level property instances go out of existence. The causal properties of the emerged entity are not the same as the causal properties of the original property instances, which no longer exist or have independent existence within the fusion. Despite no longer existing, de Haan continues to refer to parts that make up the whole.

In this context, the notion of gestalt involves relational criteria that help to capture psychiatric disorders, which tend to be multifactorial. To the extent that we think of such disorders as a gestalt arrangement of factors, each individual case of a particular disorder may show different patterns of dynamical relations among the various factors. Different factors may involve different weights in different individuals (which can be measured in a dynamical analysis, see Section Coordination Dynamics). For example, anorexia will present differently in a disciplined person with high degrees of self-control than in an impulsive individual [(25), p. 334]. Variations in the amount of social support or different cultural contexts may determine how a disorder develops. But we can expect to see typical patterns associated with different disorders. Schizophrenia, for example, may affect multiple aspects of experience, cognition, mood and agency in somewhat typical ways (26), while panic disorder will be more aspect limited in its impact (27).

More generally, as Sass et al. [(28), p. 12] suggest, in regard to characterizing the elusive aspects of changes in psychopathology, "mutations of worldly experience (like mutations of ipseity or basic self-experience) typically have an overall or holistic character that defies ready operationalization into distinct features or factors." Sass's "bio-pheno-social" model attempts to capture the multifactorial complexity of such disturbances. Thus, "alterations at the level of the lived-body [have] profound implications for both interpersonal and intersubjective dimensions of existence," and in schizophrenia, "environmental/social stressors, including childhood trauma and abuse, social defeat, and cultural dislocation/alienation" may play some pathogenetic role [(4), p. 722].

Rather than positing a hierarchical relation that treats ipseity as more basic, and then working outward or upward to more secondary factors, however, the notion of dynamical gestalt stays with the proviso mentioned above, that disorders "typically have an overall or holistic character that defies ready operationalization into distinct features or factors." Perhaps, then, the alternative worry then would be, as Parnas and Henriksen (29) express it, that "[t]his gestalt is intrinsically elusive and resists any simple, straightforward attempt to define it."

To deal with this worry, consider a clue that we can find in Gerrans's analysis. In discussing loss of the sense of agency in some schizophrenic delusions, he references studies of expert performance where, on some views, expert performance involves the absence of a sense of agency as one is on automatic pilot, or "in the flow," compared to a strong sense of agency in novice performance where there is top-down cognitive control. "We *are* more aware of our agency when learning a musical instrument … than when performing a task automatically and successfully" [(2), p. 169]. Although on this point Gerrans would seemingly endorse the Dreyfus model of expert performance (30), where expert performance/embodied coping is a mindless (non-representational) being-in-the-flow, most of Gerrans analysis puts him closer to theorists who argue, against Dreyfus, that performance involves mindful elements. In this regard, they conceive of a top-down process where low-order automatic processes of embodied coping are modulated by higher-order, reflective (representational) cognitive aspects.

This debate in the area of performance studies has motivated the development of a model that can serve as a beginning point for analyzing the factors and relations in a dynamical gestalt—the meshed architecture model (31). It's important to note that the use of this model is a first step rather than a finished product. It's meant to be a heuristic to help map out the relevant processes and to set up the next two methodological steps. More specifically, I propose the use of an enhanced meshed architecture model as the first part of a 3-fold method for explaining the notion of dynamical gestalt, and solving the integration problem. A second part builds on interventionist conceptions of causality (6). And the third part employs Kelso's coordination dynamics approach (32).

An Enhanced Meshed Architecture

The idea of a dynamical gestalt means that the various processes and factors involved are dynamically related to form a whole. This holistic view motivates a number of philosophical issues, but practically, for psychiatry, it presents a challenge both in regard to diagnosis and therapeutic interventions. Ideally, one might want to say precisely what process or factor, or what set of processes or factors, in any particular case, is problematic, and how it might be addressed. Realistically, it is difficult to be precise in this regard. The model of a meshed architecture, however, can help to map out which factors are relevant, and how they are related. I take this to be a first step in a three-step approach to gaining an explanatory grasp of specific disorders.

To explain the notion of the meshed architecture, I'm going to short-circuit all the debates in the performance literature (concerning dance, musical performance, and acting) and simply present an enhanced version of the "meshed architecture model," which I understand to be consistent with an enactive approach that can generalize to explanations of embodied-situated-social cognition (33), and some psychiatric disorders such as depression and schizophrenia, as well as conditions like autism spectrum disorder.

In performance studies, one challenge is to explain how complex cognitive processes, such as memory and attention, can guide or control what are construed as automatic motor processes in skilled performance. In many cases performance is fast and seemingly automatic, yet it is also context-sensitive and strategic in a way that suggests there is an "interpenetration of thought and action" [(34), p. 80]. In contrast to Dreyfus' notion that skilled performance is mindless, Christensen et al. (31) propose the meshed architecture model which involves an integration of cognitive and bodily (sensorimotor) processes. The mesh involves "a broadly hierarchical division of control responsibilities, with cognitive control usually focused on strategic aspects of performance and automatic [body-schematic] processes more concerned with implementation" [(31), p. 43]. On this view, cognitive control "counteracts automaticity" and introduces flexibility into motor control. Admittedly, this model starts out endorsing a hierarchical arrangement. Indeed, one pictures a vertical hierarchy that divides into two poles: cognitive at the top, descending to do its job; automatic bodily processes at the bottom receiving instructions when necessary. This initial model of the meshed architecture is, I've argued, too top-down and overly intellectualized (33, 35), and it involves a concept

of hierarchical levels that we are trying to avoid, I'll suggest ways to move beyond talking about such levels in the following enhanced model.

A more complex, enhanced conception of the meshed architecture includes three aspects that are not accounted for in the original model: (1) *intrinsic control*—integration processes that work from the bottom-up; (2) an important role for *affectivity*; and (3) a complexity introduced by what we can call a *horizontal axis*. The structure defined by mapping elements on vertical and horizontal axes operates as a heuristic that we can then drop in favor of a more dynamical, non-hierarchical, holistic model.

1. A concept of *intrinsic control*: control is not entirely top-down, but rather, on the vertical axis there are important bottom-up processes that are not automatic.

Motor control, body-schematic processes are attuned by practice and provide the freedom to pay mindful attention to relevant surrounding factors. But such processes should not be viewed as fully automatic. Jonides et al. (36), for example, explicitly argue that motor control processes overall do not automate. Evidence from kinematics suggests that body-schematic processes are perfectly specific, adaptive and highly dynamical such that they adaptively attune to differences in situations (environmental conditions, object positions, initial and unfolding body postures) and agentive intentions. In contrast to an intellectualist view that insists on the automaticity and "perfectly general" nature of such processes [e.g., (37)], body-schematic processes are neither fully automatic (blindly pre-set, like a reflex, to do the same thing in each circumstance, regardless of differences), such that in varying circumstances they require top-down cognitive guidance, nor perfectly general; they rather include a specificity that involves an "enormous number (which often reaches three figures) of degrees of freedom" (38), as well as a complex temporal organization involving anticipatory processes across skeletal geometry, kinematic phase constraints, muscular geometry, and the dynamics that characterize the relationship between kinematics and geometry (39, 40). These complex processes come to intelligently align with a particular intentional trajectory, *not automatically* (clicking into place in a machine-like fashion), but rather, in a way that is flexibly attuned to the particularities of the situation.

We can think of this attunement as a form of habit, developed when the body "acquires the power of responding with a certain type of solution to a certain form of situation" [(41), p. 143]. Habit involves an intelligent response, where intelligence is built into the movement. Instead of blind automatic repetition, habit is an open and adaptive way in which the body learns to cope with familiar or unfamiliar situations. Intrinsic control involves motoric processes that are already context-sensitive, smart, open and adaptive, such that they can even elicit or shape or enable the required cognitive elements that may be contingently incorporated into the mesh. Sensorimotor processes regulate the activation of specific cognitive processes when they are needed. Accordingly, mindfulness is not simply imported from the "top;" it's already built into the "bottom," and, again in some cases, such habitual processes may be what guide any need for more reflective cognitive processes.

Skills and habits can persist even in pathologies where forms of memory that are more cognitive are lost, as in cases of dementia. Christian Tewes cites a patient of Thomas Fuchs who in advanced stages of dementia is still able to skillfully play football with his grandchildren [(42), p. 301]. As Tewes explains, this is not automatic behavior but "situation-specific embedded action patterns that depend on attention to and implicit understanding or know-how of the respective social context" [(43), p. 383]. Such skill is also strongly linked to previous life experiences even if, as in the case of dementia, these life experiences cannot be explicitly recalled by the subject.

2. *Affective processes* modulate the dynamics of integration.

In addition to the reciprocal vertical integration of cognition and body-schematic attunement, affectivity is an important factor. In the broadest sense this includes emotion processes, but also more general and basic bodily states such as hunger/satiation, fatigue/high energy, pain/no pain/pleasure, including "existential feelings" (44), and what Maise (45) calls "affective framing," which shapes our ability to cope with the surrounding world (46). Along with skills and habits, affect introduces possible modulations of functional integration with that world. Affect may work differently in different types of skilled actions, where important differences may have to do with the way that affective factors are integrated with motoric/agentive factors, the kinetic and kinaesthetic feelings associated with body-schematic processes, and how all of these processes integrate with environmental constraints and affordances (47, 48).

Affective processes can directly shape body-schematic processes—slowing down or speeding up such processes, for example, or leading to the adoption of certain initial postures that may influence how agents are functionally integrated with the world. Affect and body-schematic processes are integrated, but affect also allows for an integration attuned to targets and environmental features located on a horizontal axis.

3. A *horizontal axis* that integrates ecological, social and cultural-normative factors.

The more enhanced conception of the meshed architecture incorporates horizontal integration of ecological, social, cultural/normative aspects, including physical and social affordances (see **Figure 1**). On this view, what makes performance what it is not entirely internal to the performer. To return to Gerrans' comment on the sense of agency, as one engages in a particular action, one's sense of agency may be modulated (causally influenced) by affect, but also by social context and the quality and quantity of affordances available. When, for example, the performer "can 'feel' that her motor system has the right configuration" (31), this configuration is just the right one to mesh with the specifics of the performer's physical and social environment. Neither body-schematic processes nor affective processes are isolated from the agent's environment; rather they are attuned to both stabilities and

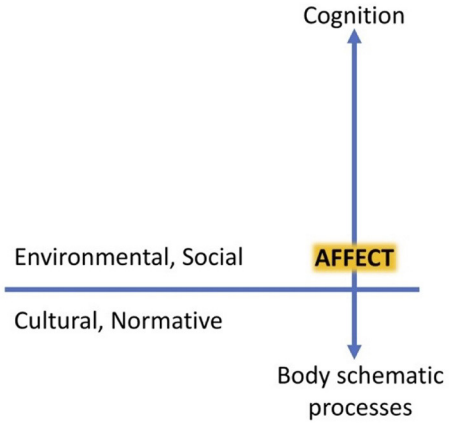

FIGURE 1 | Vertical and horizontal axes of the meshed architecture [from Gallagher et al. (49)].

variations in environmental factors, including other agents. The subject's experiences are situated, i.e., functionally integrated with the environment, which is not only physical, but also socially, culturally, and normatively defined.

The notion of a meshed architecture offers a pragmatic heuristic in the service of mapping or diagraming relations. On the one hand, the distinction between vertical and horizontal axes in the meshed architecture offers a way to start thinking about how the different processes and factors integrate or mesh. On the other hand, thinking about how different factors integrate as a dynamical gestalt implies a holistic rather than a hierarchical arrangement of factors. As we've seen, some integrative approaches remain narrow in the sense that all of the important processes are conceived of as happening "in the head," or specifically on the vertical axis. For example, Gerrans (2) explains the "cognitive architecture" of schizophrenic delusions of control and thought insertion by integrating elements that are neuronal and phenomenological (e.g., the sense of agency), with cognitive-narrative components generated in the default mode network. These are all conceived to be arranged in top-down/bottom-up inferential processes on the vertical axis. As he indicates, "the system is hierarchical, with each level in the hierarchy using the predictive coding strategy. Error systems propagate up and down the hierarchy" (p. 165). One's sense of agency depends on such processes. It arises in the interactions between body-schematic/proprioceptive feedback loops and "higher-level, explicit, visually guided control, or (sometimes) mental rehearsal of action' (p. 166). If it goes missing in schizophrenic delusional experiences, that can be explained by disruptions in such processes. Gerrans' analysis gets more complex when he attempts to explain why the schizophrenic attributes the action or thought to an external agent. Indeed, issues surrounding the sense of agency are even more complex when one takes into account the role of ecological and social factors (50). One needs to go wider and to incorporate the horizontal axis into the explanation. It's not clear, however, where social factors fit into the hierarchy that Gerrans describes. Moreover, on a dynamical gestalt view it's not clear why we should think of them as higher-order processes compared to neuronal or body-schematic/proprioceptive processes (unless we have already made some reductionist assumptions or have decided apriori that relations have to be hierarchically arranged). Neural and social processes can be co-temporaneous and either aligned or integrated across time scales in non-linear arrangements involving dynamical causality, without an up or down.

For the vast variety of psychopathological phenomena, including delusions, we need to go wider and to scale out to include the horizontal axis—the ecological, social, cultural, and normative factors. If we think of the mesh as a dynamical, constantly changing gestalt, we may still be able to get a bearing on what factors might be heavily weighted and duly or unduly influential in any particular case. But further explanation requires an account of the dynamical relations that exist amongst these elements so that we start to think of the mesh as a set of processes in which vertical and horizontal are clearly just explanatory abstractions. To be able to specify these precise relations, however, we require two other parts of the method.

Interventionist Causality

The second part of this methodological approach derives from Woodward's (6) conception of interventionist causality in contexts of both experimentation and therapy. Woodward understands causality to be a probabilistic counterfactual dependence relation. In other words, X causally relates to Y iff an intervention on X makes a difference to the probability of Y assuming appropriate background conditions. Causal relations are established using interventions to show probabilistic dependencies between variables. Accordingly, this theory allows for causal relations between a wide variety of factors (biological, psychological, social, etc.,) regardless of whether or not one thinks of such factors as existing on different levels. We can take intervention in a broad sense to characterize any possible event or change that could influence a particular factor or process. This would include experimental and therapeutic interventions. In a gestalt arrangement, a change to one variable, above a certain threshold, will likely cause changes in other variables in the system. That includes any change in brain, organism, environment, or in any particular habit or practice. These may be changes in a life circumstance (for example, a traumatic experience), or in a controlled experiment (for example, the presentation of stimuli that would alter a person's mood), or in a therapeutic context (for example, medicating or changing cognitive or motoric habits). Life, or the experimenter, or the therapist intervenes on a particular process. Above a certain threshold, we would expect that such an intervention could have significant effects on the processes or factors that define the dynamical gestalt.

If we want to understand how changes in one factor can lead to changes in other factors, or to more holistic changes, we can devise experiments that precisely target one particular variable to see what other processes might change as the result. This can be more than just an intervention on an internal mechanism (e.g., a drug effect on neuronal processes)—it can be

an intervention on a social factor, or a therapeutic intersubjective practice which can lead to a rearrangement of the entire gestalt [see, e.g., (51)]. Precision intervention methods allow us to identify the relations that are enabling, constraining, or that involve dynamical causality.

As an example, consider therapeutic interventions on body-schematic processes to address psychomotor retardation, deviant gait and posture in Major Depressive Disorders (MDD). In a meta-analysis Reed and Ones (52) reviewed 158 studies showing that positive affect is increased by engaging in physical exercise (e.g., walking). Studies have also shown that depression affects how self-related information is processed, biased toward the recall of affectively negative self-referent material and reduced processing of positive information. Michalak et al. (53, 54) conducted intervention experiments in which they caused alterations in posture or gait patterns. Such alterations led to changes in the subjects' recollections on self-referent positive vs. negative words, demonstrating that "biased memory toward self-referent negative material can be changed by manipulating [posture or] the style of walking" [(53), p. 124]. They thus conclude that "changes in the grossmotor system affect processes that are relevant in the etiology of depression.... Bodily aspects such as posture or movement patterns (e.g., gait characteristics) might be more than epiphenomena of psychopathology but also might contribute to an escalation of distorted processes in psychological disorders" [(54), p. 523; also see (55, 56), p. 146ff. for discussion].

Consider also that changes to ecological arrangements can result in changes to other factors. One can think of this broadly in terms of "cognitive niche construction" (57), where we design environments in ways that enhance our cognitive or affective processes, or in terms of the scaffolding function of designed environments where one can "manipulate the scaffolded by manipulating the scaffold" in order to make a difference (56). In therapeutic contexts manipulation of the environment may be facilitated by the use of virtual reality (VR). Specifically, the use of VR and mixed reality in clinical environments allows for the creation of (virtual) affordances to facilitate or support embodied, interactive, and affective therapies (58, 59). Psychotherapeutic applications of VR can address a variety of anxiety disorders (60, 61), and a variety of eating disorders such as Anorexia (62), as well as PTSD (63).

This interventionist logic can also be used to interpret a therapeutic experiment designed to understand capacities for social cognition in the case of ASD. Tager-Flusberg and Anderson (64), informed by the standard views of social-cognitive problems in autism as involving deficits in theory of mind (ToM), studied conversational ability in children with ASD. They hypothesized that impairment in conversational ability may be due to deficits in theory of mind (ToM) development. Hadwin et al. (65) then tested this hypothesis, training children with ASD on tasks that employ ToM (cognitive) abilities to understand mental states in others, focusing on beliefs, emotional states, and pretense. We can consider this an experimental test of a therapeutic intervention. Hadwin et al. compared conversation abilities prior- and post-training using four categories:

1. Simple answer—a child simply provides a one-word reply to a question and did not further engage in conversation
2. Developed answer—child is able to produce utterances that involved two or more sentences
3. Echolalic or repetitive answers
4. Unclear responses—non-sequiturs

After training on ToM tasks, the children did learn to pass tasks concerning emotional and belief understanding (but not pretense). They improved their ToM skills. However, there was no corresponding advance in social communication skills. Specifically, the experimenters found no improvement in the development of conversation and no increase in the use of mental state terms in speech [(65), p. 533]. The majority of children with ASD remained in the simple answer category and did not improve. This suggests that intervening on cognitive factors to improve ToM abilities doesn't lead to improvements in conversational ability or social interaction of this sort. Other interventions are possible. For example, early intervention to improve motor coordination could have any effect on conversational ability. I'll return to this possibility below.

Simply put, we may be able to identify factors relevant to a particular condition, and map them out using the model of a meshed architecture. Once identified, these are factors in the dynamical gestalt that we want to test by interventionist methods to discover whether and how such factors are causally related. An intervention on one factor (neuronal, cognitive, social, etc.) may shift things around, perhaps bestowing more weight on other factors, revealing causal relations that range from simple one-way causal relations to reciprocal, circular or non-linear dynamical relations. Contra the narrow view, an intervention can be more than just a manipulation of an internal mechanism (e.g., a drug effect on neuronal processes)—it can be a change in a environmental or social factor, or in bodily, or narrative practices, or, as may be the case in therapeutic contexts, some combination that can rearrange the entire gestalt.

Coordination Dynamics

The third component of the methodological approach I am outlining is based on the work of Scott Kelso and colleagues on coordination dynamics. According to Kelso, "Dynamics is a language for connecting events from the genetic to the mental" (23). If we think of the motley collection of processes and factors that contribute to our human experiences, then the dynamics that define their relations may be the common element that allows us to explain how these processes are ordered or disordered. Although much of the work of Kelso and his colleagues focuses on brain dynamics, and they continue to frame their analysis in hierarchical and reductionist terms of top-down and bottom-up arrangements, their approach generalizes to any complex dynamical system and can apply to complex dynamical gestalts such as a biological, ecological or social systems that are typically bound together by coordination between dynamical processes operating at different spatio-temporal scales (66, 67). The measuring of coordination dynamics allows researchers to

get into the fine details of dynamical processes and to develop explanatory models of how they are ordered. The method involves recording continuous time-varying processes as they unfold, and then analyzing the dynamical structure of such processes using time-series analysis. This allows for a more precise measuring of behavioral coordination by evaluating the synchronized patterning of system components as they change over time (2, 68).

Rather than tracking individual state variables, coordination dynamics studies "the topological features of the spatiotemporal patterns generated by virtue of their interaction" [(67), p. 2]. This type of analysis has focused mainly on rhythmic coordination, involving phase-locked synchronization and metastable coordination dynamics. In the latter case, phase relations are formed intermittently, rather than permanently, and this helps to preserve a diversity of processes (segregation) which are nonetheless linked (integration) (69). One can see this, for example, in social interaction, which requires both the autonomy of individual agents, and an interactional coupling that generates meaning (70). Different causal factors will have different weights in their relative contribution, some elements presumably, playing more important causal roles than others. We can think of the dynamical gestalt as a pattern, where, if one factor (or value or weight relative to the whole) is changed above a certain threshold, some or all of the other factors (and perhaps the whole) adjust. It is also in the dynamics that one will be able to measure different weighting patterns—including different connection weights between different factors [see, e.g., (71, 72)]. Such measurements will have significance for both explanation and for the tailoring of treatment.

Kelso and his colleagues are able to diagram meaningful changes in dynamical patterns as transitions in topological recurrence plots.

> Overall, topological recurrence plots reveal local and global transitions of coordination patterns in the data that elude traditional methods.… Such irreducibility of certain topological properties may tap into the very nature of collective transitions in multiscale coordinative structures.… The relational quantities in such patterns constrain each other and form [more complex] structures which may not be discernible by examining each quantity individually.… [T]he ability of topological portraits to capture global properties is a key to detecting transitions in collective patterns that are not just an accumulation of pointwise changes.… In other words, topological portraits capture emergent features in the collective dynamics that are not reducible to the sum of its parts, tapping into a key feature of complex systems [(67), p. 10–11].

The patterns to be studied can be behavioral patterns [such as those involved in social interaction, e.g., (32, 73)], or neuronal activation patterns in the brain (74). This approach, which has focused on tracing the same dynamical principles across brain, body and social interaction, is meant to be integrative, not only revealing dynamical details in the meshing or integration among different variables, but providing an integrated theory of such patterns. This kind of analysis identifies "emergent phenomena where the whole is not only greater than the sum of its parts, but different too" (32).

The relevance of this method for the study of social interactions in the context of psychopathology, can be seen in the suggestion of Leong and Schilbach [(75), p. 636]: "disordered social interactions play a pervasive role in many, if not all, psychiatric disorders.… [T]hese disorders may result as much from an "interaction mismatch" across persons as from the breakdown of individual brains." With respect to social cognition in specific, Dumas et al. (76) suggest that "the case of autism provides a test bed for an integrative approach." Following this suggestion we can see how this 3-fold set of tools—the enhanced meshed architecture, experiments based on interventionist notions of causality, and the analysis of coordination dynamics—can help us explicate the dynamical processes characteristic of the gestalt of factors involved in ASD.

AUTISM AS A TEST CASE

If the model of a meshed architecture can identify which processes or factors to ask about, an interventionist strategy to test for causal or constitutive relevance can show us how factors are actually meshing, and the application of coordination dynamics can fill in some of the details of the dynamics to give us a more complete model. Let's consider ASD as a test case for this sort of analysis.

ToM and Social Cognition

Theoretical and empirical considerations suggest multiple relevant factors in regard to questions about ASD. Compared to typically developing children, one of the primary differences found in children with ASD involves social cognition and intersubjective interaction. A standard approach is to consider such problems in social cognition to involve deficits in theory of mind (ToM), specifically in abilities to "mindread," i.e., to make theoretical inferences about one's own or another person's mental states (77, 78), or to simulate or empathize, due perhaps to disruption in the activation of the mirror neuron system (79, 80).

Such views are informed by empirical studies that show children with autism fail to pass false-belief tasks (77, 81). In the classic experiments, typically developing (TD) children at 4 years of age, on average, but not children of <4 years, are able to distinguish between how things really are in the world and what other people may falsely believe about such things. Around this age [if not earlier—see (82)], we begin to recognize that other individuals have their own sets of beliefs and intentions that inform their behavior, and we are able to explain or predict their behavior based on these mental states. Significantly, however, individuals with ASD fail false-belief tests even at mental ages significantly higher than 4 years. Individuals with autism are thus said to lack a theory of mind, and this cognitive deficit explains their lack of social responsiveness and understanding. Such views informed the experiments by Hadwin et al. (65), discussed above. In those experiments the intervention targeted specific cognitive abilities associated with ToM, but, as noted, failed to improve social communicative interaction.

ASD and Affectivity

According to ToM approaches, the important factors are cognitive and intersubjective processes. It is likely, however,

that other factors are involved. Hobson (83), for example, has argued that affective factors are directly relevant in ASD. He cites empirical developmental studies that show the importance of affective relatedness in the infants' developing capacities for social interaction as early as the 1st year of life: "very young infants have perceptual-affective responsiveness to some aspects of another person's affect-related expressiveness and behavior, even though they may not be able to discriminate specific "meanings" in abstracted expressions until the middle of their 1st year" [(83), p. 232]. Affective relationality is, according to Hobson, the basis for primary intersubjectivity (84) and manifests itself both behaviorally and experientially. He argues that deficits in affective relationality, and its concomitant effect on intersubjective interactions, lead to the cognitive difficulties seen in ASD, rather than the other way around [(83), p. 227; see (85)].

This speaks to both the integrated relations of different factors (cognitive and affective), and a certain order in the meshed architecture. In working out the meshed relations, however, one does not need to take a deficit in affective relationality to be the core or generative deficit in autism (86). More generally, taking ASD to involve a particular disorder means that there may not be any one deficit (whether cognitive, affective, or social) that can be identified as the core deficit [see (87)]. Rather, we can think that ASD always involves a pattern of differences from typical development, such that it is enough to maintain that problems with affective relationality may be part of the overall pattern in ASD. Indeed, Bird and Cook (88), acknowledging that ASD may be associated with disordered emotion processing and deficits of emotional reciprocity, argue that there are wide variations in this regard across the spectrum. They suggest that when deficits in affective relationality are observed, they may be due to a frequently co-occuring alexithymia (a condition involving reduced ability to identify or describe one's own emotion, resulting in reduced empathy and impaired ability to recognize emotions in others), rather than being a feature of autism itself. It may be alexithymia that interferes with the passing of false-belief tasks if the task involves identifying an emotion. Bird and Cook (88) suggest that the complication with alexithymia means that social impairments may be distinct from emotional impairments in the case of ASD. Although this is not necessarily the accepted view [see (89, 90)], there is growing evidence that supports the idea that difficulties in emotion processing, and lower accuracy with facial emotion recognition in people with autism, are due to alexithymia (91–93). Further research on this would require identifying individuals with autism who manifest problems with emotion processing, intersubjectivity and social communication more generally, but who do not have alexithymia.

Motor Control

Whether due to ASD or alexithymia, impairments in the production and recognition of bodily affective expressions, and in the communication of feelings, broaden to communicative behavior generally, including problems with gesture. Thus, individuals with autism "rarely make gestures such as showing, giving or pointing in order to share awareness of an object's existence or properties, or comprehend such gestures when they are made by others. . . ." [(83), p. 242]. Klin et al. (94), following an enactive model, show that individuals with autism fail to follow another's pointing gesture in some cases, and this may be tied to a lack of expertise in social perception, tied to differences in visual focus when viewing complex social situation. Their experiments show that individuals with autism direct their gaze to aspects of the environment, or to other people, in ways that miss socially salient information, for example, focusing on a person's chin instead of on their eyes.

This may also be linked to evidence that in ASD, besides cognitive and affective factors, there is some deficit in bodily processes that involve sensory-motor performance. Studies of individuals with ASD show that sensory–motor problems (specifically disrupted patterns in afferent and proprioceptive sensory feedback) can interfere with motor control (95–97). These may involve postural instabilities, atypical gait, mistiming of motor sequences, motor coordination problems, problems with anticipatory postural adjustments and expressionless faces (98–103), all of which involve aspects that normally scaffold effective social interactions and thus have implications for primary intersubjectivity (104, 105). For example, some studies have shown that children with ASD have difficulties in predicting *why* an action is being done by another person based on kinematic cues and this may reflect difficulties in the children's own motor planning [(98, 106, 107)].

Multiple studies show that infants at heightened risk and later diagnosed with ASD at 36 months have a slower progression in the development of unsupported sitting and walking (108, 109), as well as grasping and functional object use (110). Ability for grasping and manipulating objects is important for sharing them with others, and has been shown to support communicative ability and word learning in typical development (111, 112). Indeed, differential development of motor skills may have cascading effects on vocabulary acquisition, gestures and social skills, which suggests a different account of the origins of problems in social interactions compared to traditional ToM approaches (110, 113, 114).

Vertical and Horizontal Meshing

Iverson and Wozniack (115) suggest that communicative delays and atypicalities in intentional and symbolic communication in children with ASD should be considered as extending beyond the individual since they have an impact on social partners and the communicative environment understood in a broader sense. In terms of the enhanced meshed architecture described above, this would involve the horizontal axis, and a context-related dynamic interplay between the communicator and his/her social and material environment, including artifacts, instruments, and established practices in communicating with other people. Likewise, the intrinsic dynamics that involve motor control and affectivity, on the vertical axis, include the development of habits and basic skills, which, may be relevant to social communication, and are often important for participating in joint action and for processes involved in intersubjective interaction.

In contrast to the study by Hadwin et al. (65) on deficits in theory of mind (ToM) development, discussed above, an experiment by García-Pérez et al. (116) gets us closer to

what may be some more basic problems in the conversational ability of autistic children, and points to a tight meshing of affect, motor control processes, intersubjectivity and factors that define the horizontal axis [see (117, 118)]. The experiment on conversational ability showed that subjects with ASD "made fewer headshakes/nods (but not smiles) when the interviewer was talking" (p. 1310).[3] A principle of social interaction, reflected in detailed analyzes of the distributed semiotics of conversational processes [e.g., (120)], is that it involves two-way, context-rich interaction. In this respect García-Pérez et al. also studied the responses of the conversational partners, the interviewers who interacted with the children with ASD. It turns out that they also made fewer head-shakes/nods when the children were talking compared to their typical conversation style. In this regard the dynamics of the conversation itself, as a whole, change. This kind of two-sided disruption was reflected in significant differences measured as "subjective" ratings of (a) affective engagement and (b) the smoothness of reciprocal interaction (as rated by two evaluators blind to diagnosis, rating emotional connection during the videotaped conversation and the flow of the conversation on scales of 1–5).

García-Pérez et al. suggest that children with ASD show a deficient propensity to engage with the bodily-expressed attitudes of others [also see (121)]. It's important, however, not to lose track of the other side of the conversation. It's not only the children with ASD that show a deficient propensity to engage with the bodily-expressed attitudes of others, those in conversation with the children do so as well. The reciprocal dynamics that constitute the conversation collapse on both sides. As McGeer (122) notes, the burden of understanding is typically distributed between the participants who are trying to understand each other. Failure on one side may be reinforced by failure on the other side.

In the case of ASD, disruptions seemingly occur along both axes of the meshed architecture. On the vertical axis the verbal accomplishment of thought seems impaired in conversation when most responses are simple answer-type replies. This impoverishment of expressed thought may not be divorced from the various anomalies involved in sensory-motor processes that can disrupt the intrinsic control processes involved in non-verbal and gestural performance (94). Likewise, problems in the affective dimension may disrupt the possibility of smooth dynamics amongst these factors as well as with factors on the horizontal axis. The deficient interactive response of others to people with ASD may not only reinforce disruptions to communicative processes, but may also signal a change in normative expectations that accompany most social and cultural practices. Indeed, the integrative meshing of what we called the whole dynamical gestalt of intersubjective interaction seems to be differently aligned in the case of ASD [see (49), for more detail].

[3] Although a study of adolescents with ASD conducted by Capps et al. (119) found more headshaking and nodding in response to yes or no questions, the subjects were less likely to nod while listening to their conversational partners talk. They concluded that "children with ASD demonstrated limited involvement in the co-construction of a shared conversational trajectory through non-verbal as well as verbal channels" [(119). p. 337].

It's important to note that social impairments in autism are not limited to disruptions of real time coordination dynamics (as one reviewer has pointed out). They can also involve a failure of people with autism to comfortably inhabit built environments and social institutions that are organized to accommodate neurotypical styles of engagement. It's not just about eye contact or the timing of conversational responses (which may involve processes in a very short time scale—sometimes measured in seconds), but it may also include the amount of lighting or background music used in public spaces, social arrangements or cultural practices that may be upsetting to some individuals with ASD, or even disruptive to development (on a longer time scale that may be measured in years). Negotiating such material and social/normative, neurotypical environments may have a long-term impact on their embodied interactions with others within these spaces, and their "habits of mind" (123), or ways of being in the world. It may lead to what are sometimes observed in ASD, namely, "highly structured and regimented life routines that avoid novelty and the inherent unpredictability of typical social life" [(94), p. 345]. Similar things can be said about what Constant et al. [(7), p. 7] call "practical causality" (or looping effects) in the medical or psychiatric context—that is, changes in behavior caused by virtue of being classified or labeled autistic. Classifying someone as autistic may in fact change expectations and behavior.

Interventions

Intervention into this complex gestalt of different factors can happen in numerous ways. We saw a clear, albeit unsuccessful, but nonetheless telling example in training on ToM tasks (65). Psychological therapies that target emotional awareness or provide emotion recognition training, however, may improve social communication in ASD (124, 125). It is also possible to intervene by training motor control processes *via* procedural learning (107, 126). Moreover, one could think that intervention would be possible by changing the behavior of the conversational interlocutors. Importantly, it may be that improved therapy requires interventions on multiple factors.

Consider, for example, a study by Kostrubiec et al. (127) (referencing Kelso's coordination dynamics approach). The researchers compared 20 ASD vs. 21 typically developing (8–14 years of age) children on motor coordination in intentional motor tasks. They correlated the results to Socio-Adaptatif Quotient (SAQ) scores that measure communication ability and socialization (e.g., saying "please," "thanks," or "excuse me"). They found no notable differences in a simple, perceptual-motor coordination task; but children with ASD showed increasing deficits in more demanding interpersonal coordination tasks when coordination patterns were intentionally requested by the experimenter [consistent with other studies—e.g., (68, 128)]. This result also correlated to poor SAQ scores. Improved performance in older ASD children, however, suggested that therapeutic intervention would be possible. This led the researchers to the following hypothesis: "by manipulating [motor coordination] parameters in ASD children, their coordination abnormalities could be reduced, and their social deficits, perhaps, alleviated" (127). Things are more complicated, however, since there were

increased deficits in coordination when socially interacting with the experimenters, and since in other disorders, e.g., ADHD, anomalies in motor coordination do not lead to similar social deficits. This suggests not a one-way or one-to-one causal relation, but some more nuanced (dynamical, non-linear) relation between social interaction and motor coordination.

The therapeutic intervention might also be based on considering the communicative practices of the experimenters as they interact with children with ASD. Context is also surely important, and communicative interactions may be very different outside the lab, in the home, when, for example, children with ASD are interacting with parents [see (129) for an insightful ethnographic study]. Indeed, considering that there may be deficiencies in several factors, the reference to Kelso's coordination dynamics approach is apropos.

The Dynamics of ASD

Embodied and enactive perspectives on social cognition emphasize the importance of movement coordination of one's body with the other person while performing actions (social-motor coordination) (130–133). As noted in previous sections, children with ASD have difficulties in social communication skills, some of which may be due to motor deficits (found in 50–80% of children diagnosed with ASD) (134–136).

Fitzpatrick et al. (137) suggest:

> Social motor coordination both in the form of imitation and in the lesser known phenomenon of interactional synchrony, is important for maintaining critical aspects of successful human social interaction, including interpersonal responsiveness, social rapport and other-directedness… positive self-other relations… and verbal communication and comprehension (137).

Social synchronization is an important component of interpersonal interaction, across a wide diversity of situations, including emotional arousal, imitation, joint attention, parent–child exchanges, mutual gaze, shared attention, and empathy (138, 139). A breakdown or significant modulation of such synchronization or entrainment across many of these contexts are reported in children and adolescents with ASD [e.g., (140–142)]. In the case of stable coordination patterns, the variability of relative phasing (the phase relation between movement patterns) between two or more individuals reflects the strength of coupling or alignment. Higher variability, as found in ASD, reflects weaker coupling.

Using coupled oscillator modeling,[4] Fitzpatrick et al. (68) showed that adolescents with ASD demonstrate less interactive synchronization in both spontaneous and intentional social coordination, corresponding to lower sensitivity and decreased attention to the other person.

> Adolescents with ASD demonstrated a disruption of both spontaneous synchronization and intentional synchronization.… [T]he ASD group [compared to typically developing adolescents] had weaker spontaneous synchronization … when participants were viewing each other's pendulum.… ASD participants synchronized less well under conditions in which synchronization occurs spontaneously in the presence of perceptual information of the social partner and in situations when there is an explicit social goal to coordinate with another person (e.g., intentional synchronization).

The researchers suggest two possible interpretations of these results, namely that the synchronization problems of adolescents with ASD involved problems with either attention or motor control. Di Cesare et al. (143) suggest that it may also involve lack of perceptual sensitivity to variation in vitality forms, but that this too may be due to motor atypicalities in ASD [also see (68, 135)].

An alternative method using coordination dynamics to study non-linear dynamics of human social coordination, including behavioral measures of social interaction (and interpersonal synchrony) in people with ASD, employs a research tool called the Human Dynamic Clamp (HDC). This set-up allows a dynamic bidirectional interaction in real time between a human and a virtual avatar (modeled on human-human interaction) (76, 144). Using this method, Baillin et al. (136) studied behavioral aspects of interpersonal synchrony in ASD, considering several variables, including motor control and emotion recognition.

Noting that children with ASD have difficulties in coordinating their body during social exchange (see the research cited above), Baillin et al. showed lower motor skills among ASD participants suggesting a significant link between motor skills and social-cognitive skills among a population of children and adolescents. The low score on motor ability was the only significant factor that distinguished the ASD from the typically developing individuals.

Social interaction is not unidirectional, of course. We know that there is a difference between a one-way coupling, for example when a participant is responding to the movement of a computer-generated avatar who is not responding to them, and a two-way interaction [see (145)]. As indicated above, one's own response may depend on how one's interlocutor or social partner responds. The use of coordination dynamics should also be able to throw light on this. The degree to which social partners contribute to entrainment in joint coordination may differ. The results of the above experiments suggest that persons with autism may adapt their movements less to those of their partner. But it is also possible that (1) the social partner compensates for this by adjusting their own movement, or (2) that the partner shows less entrained attunement when coordinating with an individual with ASD.[5] There is some evidence of differences in people's motoric response to those they perceive as psychologically different. For example, Brezis et al. (148) report that an experimenter, who was not blind to the diagnosis, interacting with subjects with ASD, moved

[4]This task allows for the study of both intentional (following instruction) and spontaneous interpersonal coordination. Two people coordinate handheld pendulums swinging them "from the wrist joint in the sagittal plane (using radial-ulnar abduction–adduction). This methodology has demonstrated that the strength of interpersonal synchronization … can be understood in terms of a dynamical model of synchronization.… Using such a dynamical model to understand how synchrony breaks down in social deficits has the distinct advantage of allowing one to infer which dynamical components of the model are underlying the impairment" [(137), p. 3; also see (128)].

[5]Peper et al. (146) point to a possible strategy to measure these differences developed by Słowiński et al. (147).

more slowly than when interacting with typically developing participants [also see (149)]. This is a question that calls for further experimentation and clarification. Generally speaking, interaction is reciprocal in the sense that in typical social encounters understanding is distributed between the person trying to understand and the person who is trying to make herself understandable (122).

To conclude, these studies of interactional dynamics in ASD can yield significant detail about the precise nature of disordered communication and interactive practices. They clearly motivate further experiments and more comprehensive therapeutic interventions that can help to define the dynamical relations existing among motoric, affective, cognitive, social and ecological factors and their disruption in ASD [see (150, 151) for just such a comprehensive approach]. This, in turn, would allow us to map more precisely the meshed architecture of the dynamical gestalt in the context of social interaction and relevant disruptions.

CONCLUSION

I set out to address the integration problem in psychiatry. I noted that this problem is tied to conceptions of causality and explanatory levels in our understanding of mind and human social existence more generally. I proposed a 3-fold method for exploring the dynamics of integration, based on a concept of dynamical causation and a non-hierarchical (level-free) notion of gestalt. In these terms I've explored ASD as a test case. This approach supports an analysis that both distinguishes and integrates the various factors and processes that contribute to differences in social engagement found in ASD. The model is different from, on the one hand, most standard explanations of autism in terms of ToM or any one factor. It rather focuses on a pattern of dynamically intertwined factors. On the other hand, this model is also different from the model of a fused integration (1), which would necessarily fail to capture or discriminate the specific factors that contribute to this pattern.

On this dynamical gestalt view I've argued:

1. We can give up explanatory concepts of levels or hierarchy;
2. but still use interventionist analysis to identify causal relevance—non-linear/dynamical causality that allows useful distinctions to be made between various factors/processes, and at the same time, can account for their integration;
3. and provide a dynamical systems explanation that can sort out in some detail the dynamical relations that define the gestalt.

I take this approach to be consistent with a wide enactive approach to psychiatry which offers alternatives to reductionist explanations in terms of hierarchical levels [see (1)] and emphasizes the dynamical interaction of factors that span brain-body-(physical and social) environment.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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Paving the way for systemic phenomenological psychiatry - the forgotten heritage of Wolfgang Blankenburg

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Phenomenological psychopathology focuses on the first-person experience of mental disorders. Although it is in principle descriptive, it also entails an explanatory dimension: single psychological symptoms are conceived as genetically arising from a holistic structure of personal experience, i.e., the patient's being-in-the-world – and of its dynamic unfolding over time. Yet both classical and current phenomenological approaches tend to identify the essential disorder or "trouble générateur" (Minkowski) of mental illness within the individual, thereby neglecting the relevance of the social context not only for the emergence of symptoms but also for their treatment. The work of Wolfgang Blankenburg on schizophrenia represents a noteworthy approach to overcome this individualistic tendency. He introduced the concept of "loss of common sense" as the structural core of schizophrenic experience and being-in-the-world and he considered the social and most importantly familial context for the emergence of schizophrenic experience. By accounting not only for personal experience but also for interactional structures of families and social milieus in which experience is embedded, Blankenburg thereby offered ways to combine phenomenological and systemic explanations of mental disorders. Beside his most renowned work on "the loss of common sense," in this paper we also present his family studies of young persons with schizophrenia, which have so far received little if no attention. We thus discuss the different ways in which Blankenburg expanded the phenomenological approach into a more systemic and social direction. We then link Blankenburg's work with current systemic explanatory models of schizophrenia and explore the clinical and scientific implications of this link. Finally, we call for further research on the synergy effects between the two.

KEYWORDS

phenomenological psychopathology, systemic therapy, psychosis, phenomenological sociology, therapy of psychosis

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Introduction

Phenomenological psychopathology as a discipline aims at understanding so called mental disorders by focusing on and exploring first-person experience. As we will outline below in more detail, *understanding* mental disorders has been related to a merely descriptive endeavor, yet phenomenological psychopathology has also an explanatory goal. In the first part of this paper, we focus on what explanation means in phenomenological psychopathology and highlight how phenomenological explanatory modes might *per se* entail a systemic orientation. At the same time, we highlight one important limitation of most current phenomenological explanatory attempts within psychiatry, i.e., their individualism.

The central aim of this paper is to present the work of German psychiatrist Wolfgang Blankenburg on schizophrenia as a noteworthy approach to overcome this individualistic tendency. Blankenburg's research broadened the field of phenomenology into a theory of dialectics between self and world, with a strong emphasis on cultural and especially familial structures of interaction. Although Blankenburg's work is very renowned in the international scientific community, his later research on families of persons with schizophrenia has not received much attention. In this paper, we thus especially focus on Blankenburg's later writings.

In the last part of this paper, we look at Blankenburg's work through systemic lenses and emphasize several systemic aspects in his explanatory accounts of mental disorders, and of schizophrenia more specifically. We thus suggest that Blankenburg's work has expanded phenomenology – and phenomenological explanations – toward a systemic direction. We finally highlight the links between his research and the field of systemic therapy and point out opportunities for further exchange between current phenomenological and systemic thinking in psychiatry and mental health.

Part 1. The explanatory dimension of phenomenological psychiatry

The phenomenological method and the explanatory power of context

The connection between phenomenology and psychiatry has a long tradition that dates back to more than 100 years. Phenomenology attempts to reveal the intrinsic lawfulness of subjective experience independently of the idea of a general reality or external laws of nature. It thus claims that it is not possible to understand the domain of experience by making use of laws and principles that apply to the physical one (1).

Informed by Husserl's method, phenomenological psychiatry thus focuses on the domain of consciousness and subjectivity. It refuses the physicalist perspective of mainstream psychiatry that attempts to explain (the altered experience in) mental disorders to (supposedly objective) physiological dysfunctions at the neurobiological level of the brain. When it comes to mental disorders, the phenomenological approach thus does not focus on symptoms at a behavioral or physiological level but instead on the "conscious psychic event" (2), i.e., on patients' experience (3).

Jaspers (2), who was the first to introduce phenomenology into psychopathology, recognized the importance of an in-depth exploration of patients' first-person experience for the understanding of mental disorders. He introduced in psychopathology the seminal distinction between the epistemic modes of *explanation* and of *understanding*. On the one hand, the first refers to the establishment of causal relationships by means of repeated observations and thus mainly includes the physical realm of causality. More specifically, with the term *explanatory psychology* he characterizes approaches dealing with processes outside consciousness and the mechanisms through which they may determine conscious, psychic experience. Such "extraconscious mechanisms" are described as being essentially of somatic form (2). On the other hand, Jaspers speaks of *psychological understanding* as an emphatic and intuitive mode of knowledge, where experience is to be understood in its own terms. Here, Jaspers speaks of phenomenology as a descriptive psychology, i.e., as the *static understanding* of a person's subjective and conscious experience. On the whole, this approach results in the description of the present and lived condition, rather than on the extraconscious that determines these experiences (4). Contrary to static description of the conditions of experience, *genetic understanding* aims to trace the emergence of one psychic state from another (2). Genetic understanding consequently poses the question of the dynamic unfolding of one experience into the next and the meaningful unity in which they are contextualized.

Jaspers did not exclude explanation from the field of psychopathology and he rather argued for the need of methodological pluralism. Yet at the same time, by introducing for the first time the phenomenological method in psychiatry, he stressed the importance of focusing on experience *per se* and thereby on the domain of psychological understanding as the very foundation of psychopathology.

Many phenomenological authors thus have stressed that phenomenology – and phenomenological psychiatry - by only focusing on the experiential level has a merely descriptive and not explanatory function. However, based on the definition of phenomenological psychiatry as an *eidetic science*, starting from authors such as Binswanger and Minkowski (5), it is in fact possible to speak of an *explanatory dimension* of phenomenology

both in terms of static and genetic understanding[1]. Interestingly, as we will now outline in more detail, explanation in phenomenological psychiatry is realized by the means of *contextualizing parts into a whole.*

Eidos or essence in phenomenology refers to a holistic structure or gestalt of different parts or elements of experience. This structure is neither independent of these elements or external to them nor can it be reduced to the mere sum of these elements–it indicates the way these elements relate to one-another as a comprehensive whole (5, 7, 8)[2]. Accordingly, eidos or essence here implies that what is merely factually experienced by the subject is anchored in more fundamental, more comprehensive structures of experience, i.e., someone's "being-in-the-world."[3] The Heideggerian concept of "being-in-the-world" (10) designates a comprehensive whole of experience composed of different elements such as world, mood (being-in) and understanding of our being. A single experience always thus occurs in further, implicitly experienced structures of this being-the-world. The aim of phenomenological psychiatry is to determine such concrete and immanent structures of experience in terms of a specific form of being-in-the-world of a patient. These structures determine single experiences and might thus play a causal role in the development of symptoms of a mental disorder (11).

Based on this concept of essence, whitin *static understanding* single experiences (such as perceiving an object or having certain feelings) are conceived as arising from the actual, present, and holistic structure of personal experience (i.e., the patient's being-in-the-world). The aim of static understanding is thus to grasp the current underlying common meaning and unity among subjective experiences, i.e., the eidos as structural and present state.

In contrast to the structural analysis of one's present state, *genetic understanding* strives at grasping the modification of the structure of experience over time, for instance by looking at a person's biography (12). Genetic understanding does not only concern–as in Jaspers–the emergence of one psychic phenomenon from another, but also and most importantly, how one (eidetic) form of being-in-the-world emerges from another and may thereby give rise to psychological symptoms. Sass and Parnas (11) recognize a sort of "autonomy of the phenomenological," in that the very transformation of subjective experience can sustain and play a causal role in the development of experienced symptoms.

Far from being a merely descriptive endeavor, a phenomenological analysis can thus provide explanatory insights on the development of the disorder both in present state and over time. Moreover, by emphasizing that consciousness needs to be considered as a meaningful gestalt and not as a mere aggregate of "mental objects," phenomenological psychiatry overcomes the reductionist view of mainstream psychiatry, in which symptoms are considered as independent object-like entities, which can be objectively measured independently from each other (3, 13–15).

The phenomenological method thus already introduces a fundamental systemic principle when it comes to explaining psychological symptoms: Every experience and symptom cannot be explained acontextually but must be always viewed with regard to the meanings that it derives from its eidetic contexts and structure of experience in its temporal and dynamic unfolding.

Phenomenological psychiatry and the problem of individualism

Although –methodologically- phenomenological psychiatry stresses the importance of contextualizing single symptoms and experiences within a systemic whole, the focus has still been mainly limited to the individual person. There have been notable accounts, which have especially analyzed the relevance of intersubjectivity for the constitution of experience and have taken intersubjective factors into consideration in processes of static and genetic understanding. The dimension of intersubjective experience was in fact present in phenomenological descriptions of mental disorders right from the very start, e.g., in all authors from the so-called "Wengener Circle," i.e., Binswanger, Minkowski, von Gebsattel and Straus (16). However, the intersubjective dimension was and still mostly is considered as a quality of the *individual's* experience and *their* being-in-the-world. Intersubjective factors hence have been mainly considered to be the byproducts of a primary disturbance of experience, which originates and resides within

1 It is important to mention that Jaspers' use of phenomenology in psychopathology was restricted to a description of single psychic states without trying to determine broader eidetic structures of experience and their evolution over time – as phenomenological psychopathologists starting with Binswanger, Straus, von Gebsattel and Minkowski did from the 1920's on (5, 6). Jaspers later showed himself sceptical of this attempt (7).

2 When looking at a painting, for instance, we never see single colours or lines but landscapes, faces or objects. We wouldn't however say that theses structures are *outside* the painting. They are in fact the painting itself in terms of an holistic form of manifold colours and lines, which wouldn't ever become a painting as a whole if looked at separately. Another example are emotional expressions: When somebody smiles at us we never only see moving lips and cheeks but the immediate expression of friendliness. Again we wouldn't claim this friendliness is external to the facial movements. Friendliness is the internal structure of those movements. It is what holds them together.

3 See also Romano's concise analysis on holism of experience in phenomenology (9).

the individual[4]. Phenomenological eidetic explanation has thus mainly focused on the individual person rather than her social context[5].

For example, the current predominant theory of schizophrenia in the field of phenomenological psychiatry conceives it as a disorder of the minimal self (22, 23). According to this account, schizophrenic symptoms are rooted in a disturbance of self-affection, i.e., someone's basic, pre-intentional and vital sense of self, i.e., the minimal self. The essence or structure of a mental disorder such as schizophrenia is therefore in this case viewed as residing *within* the individual, i.e., a loss of self affection or diminishment of the minimal self. As a consequence, this account tends to bracket social factors of schizophrenic experience–factors that would come to the fore by looking at the embeddedness of self-experience into the *world* via manifold forms of interaction. This contemporary phenomenological account of schizophrenia thereby seems to confirm the well-known and almost classical criticism expressed toward phenomenological psychiatry: it remains limited within a narrow individualistic perspective, thus the social aspects are secondary and not constitutive of lived experience (24–27)[6].

But how come that in the meaningful whole of experience and its dynamic unfolding such intersubjective factors are so downplayed? Considering that the explanatory power of phenomenological psychiatry lies in contextualizing single symptoms within an holistic gestalt of experience this individualistic tendency appears surprising. For if single symptoms experienced by an individual are to be explained through this individual's whole of experience, why should phenomenology then as a next step not try to explain this individual structure through its broader context, i.e., the structure of its relational and social world? In other words: why should contextualizing eidetic explanations stop at the individual level?[7]

Another important consequence of downplaying intersubjective aspects in the analysis of experience becomes evident when considering explanations beyond the phenomenological domain, i.e., the determination of experience by processes outside consciousness in terms of explanatory psychology (2). According to Sass and Parnas (11) and Sass (32), in the case of schizophrenia, the experiential basic disturbance of the minimal self is seen – from a genetic explanatory perspective - as primary, since it concerns the most basic act of awareness, which is conceived as being the foundational level of the self (33). By conceiving the minimal self as primary and foundational for consciousness and experience, the authors conclude that the disruption of this level might "be a rather direct consequence of a neurally based cognitive dysfunction" (11, 32). They thus encourage empirical research looking for the neural correlates of self-disorders, as a future direction for phenomenologically informed research on the pathogenesis of schizophrenia.

It here seems that the physicalist approach of biological psychiatry that was rejected from the front door of phenomenology, returns from the back door after all. Although in Sass's and Parnas's (11) proposal, subjective experience is not reduced to a mere epiphenomenon of neurophysiology (as they recognize even the causal relevance of phenomenological processes), the "ultimate causal primacy" for the basic experiential abnormalities of the minimal self is indeed located in neurobiological abnormalities in the brain (11)[8]. It thus seems surprising how the two authors claim an explanatory power of context (in terms of phenomenological

4 This becomes evident even in concepts opposing an individualistic stance, such as Binswanger's concept of being-beyond-the-world, which he developed in order to challenge Heidegger's focus on selfhood (17): In his Ellen West's case study, Binswanger (18) speaks of a lack of this being-beyond-the-world seemingly characterizing West's *Dasein* from the very start. For Binswanger, this lack is not constituted by West's social context, but is constituting this context instead. In his analysis, he thus neglects to give an extensive account of it.

5 This focus of phenomenological psychiatry is, however, not a methodological one-way road preordained by phenomenological philosophy. Besides the branch of phenomenological sociology (see below, 2.2), especially the developments of phenomenology in France give proof of phenomenology's sociological potential. Here, phenomenologists such as Merleau-Ponty and especially Sartre intensely grappled with questions of social environment and collectives, ultimately linking phenomenology with Marxism [cf. (19)]. This is probably the reason why critical psychiatrists, such as Franco Basaglia in Italy or Klaus Dörner in Germany, eventually felt much closer to Sartre than to the phenomenological psychiatric canon (20, 21).

6 Here one could also argue that the intersubjective dimension is very present in contemporary phenomenological analyses of schizophrenic experience, e.g. in the *Examination of Anomalous Self-Experience* [EASE, (23), see for instance Item 2.12] and even more so in the recent *Examination of Anomalous World Experience* [EAWE, (28)]. But again (see footnote 4) EASE and EAWE describe the *indivual's* self- and world-experience and not the world that this experience arises from (e.g. her family-context, social milieu, class, gender etc.). In other words, it is the individual that is focused on, interviewed and scored – not her family or her work place etc.

7 One could say that Foucault's quarrel with phenomenological psychopathology was all about this problem. When he then left phenomenological psychiatry behind (24, 29) he in fact kept the concept of eidos and eidetic explanation well in mind and applied it to socio-historical phenomena (thus speaking of *historical apriori*) (30, 31).

8 Interestingly, Sass's and Parnas's approach is in close to Huber's classical concept of "basic disorders close to substrate" [substratnahe Basisstörungen] (34): based on the phenomenological method, Huber and his colleagues described symptoms of chronic forms of schizophrenia and claimed that these basic symptoms were at the core of schizophrenic experience (35). They then believed that these symptoms were the closest that the analysis could get to finding neurological correlates–i.e., that it was finally the brain producing these symptoms.

structures and processes) but then in fact stop at the individual level (and finally the individual brain) – instead of continuing by contextualizing this eidos in broader fields of explanations, i.e. *social* structures of being and interaction.

In contrast to these individualistic tendencies in phenomenological psychiatry, Wolfgang Blankenburg broadened the scope of eidetic explanation, i.e., he looked for intersubjective structures from which individual experience and symptoms may emerge (and to which they may react to). In the following and main section of this paper we will present this project.

Part 2. Expanding phenomenological psychiatry toward the social: Wolfgang Blankenburg's approach

The work of Wolfgang Blankenburg and especially his research on schizophrenia is a common reference for many contemporary phenomenological psychiatrists. One of his key concepts on which current phenomenological authors have drawn (36–39) is that of a *loss of common sense* (or loss of natural self-evidence) as a typical modification of experience in schizophrenia (40, 41). With this concept, Blankenburg tried to capture a difficulty or inability to naturally engage in everyday social interactions and to pragmatically access the world. This is shown for instance in difficulties to spontaneously read between the lines of what others say and express, which has also been traditionally described as "schizophrenic autism" (38, 39).

Blankenburg developed this notion especially in the *The loss of natural self-evidence,* a single-case study about the experience–both inside and outside of clinical contexts–of the patient Anne Rau, a person with a hebephrenic schizophrenia (40). One of the main results of Blankenburg's phenomenological analysis is that the loss of common sense does not only play out at the level of intentional thinking but also at the intercorporeal dimension of embodied and intuitive interaction. Blankenburg's analysis here echoes classical phenomenological concepts such as Minkowski's "rationalisme morbide," "affaiblissement pragmatique" (42) and Binswanger's "schizophrenic eccentricity" (40, 43). In the same vein as these authors, Blankenburg tries to give a detailed account of the structure or *eidos* of Rau's schizophrenic experience, which he classified in four experiential dimensions: world, time, ego/selfhood and intersubjectivity (40).

Although Blankenburg's eidetic analysis remains mainly on the level of *static understanding* (see above) he also tried to *genetically understand* how the structure of Rau's experience arose from her biographical background and familial socialization. When describing what Rau herself later called natural self-evidence, she indeed often refers to her biographical and familiar background, as for instance in this quote: "Only mommy can give this to me. Or it must be a family, who gives back this naturality" (40). For Blankenburg here "mommy" does not stand for Rau's own mother (with whom she describes a rather troubled relation), but more generally for the socializing function of family, i.e., the mediation between an individual person and her social surroundings. Blankenburg refers here to the emergence of a "basic trust" as the foundation of any interactional relation of an individual with her surroundings (40). His analysis leaves the question open as to how such a loss (or re-establishment) of trust and self-evidence toward the world might concretely occur.

Current phenomenological accounts of schizophrenia–as the ones we have presented above–integrate Blankenburg's intersubjective notion of loss of common-sense and reinterpret it as a consequence of a subjective disturbance of minimal self-experience. Thereby they decontextualise the subject from the practical-social life processes. In contrast, Blankenburg believed that an understanding of schizophrenia as loss of common sense must go beyond the individual structures of consciousness and recognize the intersubjective constitution of different worlds and socio-cultural contexts underpinning the individual experience of patients. In other words, Blankenburg claimed that the concept of common sense and of its loss in schizophrenia calls for an analysis not only of the self but even more of the social and cultural context, i.e., the different *lifeworlds* in which the constitution of everydayness is inhibited (12, 40, 44, 45). Especially the later works of Wolfgang Blankenburg, with their strong orientation toward the lifeworld of patients, are a notable example of how a phenomenological analysis may take into account the social dimension and its explanatory power in the case of schizophrenia and more generally for mental disorders.

The expansion of phenomenological psychopathology into a more social and–one might argue–systemic direction can be described in the work of Wolfgang Blankenburg at three different and yet related levels. At the conceptual level, he emphasized the importance of theories from phenomenological sociology and ethnopsychiatry, in order to understand the social constitution of experience and the cultural and sub-cultural specificity of interactional norms (and the loss of sense for them). At the empirical level, Blankenburg et al. (46), studied the evolution of schizophrenic experience within the familial context: he differentiated between different family milieus related to specific structures of meaning and explored possible therapeutic means for recovery. At the methodological level, Blankenburg argued for a dialectical perspective, inviting professionals to understand schizophrenic experience and symptoms as a result of the interaction with the surrounding world, thereby questioning professionals' individualizing and deficitary gaze. In what follows we outline and discuss these three perspectives of Blankenburg's work.

The conceptual expansion: Focusing on the social structures of the lifeworld

We have previously introduced eidetic phenomenological psychiatry as a method of contextualizing and thus explaining single symptoms within a structural whole of experience. We then critically discussed the application of this method in the history of phenomenological psychiatry, which has been limited to the individual level. However, Husserl in his later works on the constitution of lifeworlds [(47), cf. (48)] shows how trans-individual and even transcultural structures of intersubjectivity are accessible to our individual experience. Phenomenological sociology as a discipline founded by Alfred Schütz[9] focuses exactly on such overarching structures of social interaction in which our subjectivity is embedded. The basic idea here is that these structures–in terms of sedimented knowledge and typifications of the world and implicit rules of interaction–are both produced and *re*produced by our social and intersubjective experience, that they serve as context that both forms this experience and is formed by this experience–finally constituting our experience of a commonly shared normality and "paramount reality" (50)[10].

Drawing on the tradition of phenomenological sociology, Blankenburg conceptually extended the field of phenomenological psychopathology so as to enable a phenomenology of the social, beyond the individual (45, 52, 53). Indeed, through the lenses of phenomenological sociology he explored how the structure of individual experience might be affected by the structure of broader social contexts. Importantly, for Blankenburg these social contexts and structures are not considered as being outside of consciousness but, on the contrary, as being *phenomenologically* accessible.

The central question for him was more specifically how the experience of reality of persons with mental disorders might be constructed as a deviation from the above mentioned shared common sense-normality in mutual constitutive processes between them, the environment and also the psychiatrist (44, 45, 53).

Adopting the perspective of phenomenological sociology thus lead him away from the individual to the constitution of more general and social structures of interaction, or as he puts it:

> "This line of questioning leads from the reality experienced and shaped by the patient back to subjective and intersubjective processes of reality that are to be traced for the individual as well as for his or her family and (historically) for entire societies" (12).

This conceptual expansion toward a more socially oriented and systemic approach in Blankenburg's work was not only based on phenomenological sociology but, importantly, also on an ethnopsychiatric perspective, i.e., the field of transcultural psychiatry [(54), cf. (55)]. In his essay *Ethnopsychiatry in the homecountry* [Ethnopsychiatrie im Inland] (56) he shows how the natural self-evidence and common sense varies in different subcultures and communities. He thus argues that a diagnosis of a mental disorder should be paralleled by an understanding of such a community, e.g., through an ethnographic investigation.

Blankenburg for instance reports the case of a farmer's son, brought to a psychiatric hospital, who believed he was capable–by divine intervention–of turning water into gasoline and to chase the "evil one" out of the farm's stable (56). Although a psychiatrist at first glance might immediately take the patient's experience as entirely delusional, Blankenburg noticed that the father, too, believed in "the evil one" and he himself had already tried to catch it in his stable. Instead of also being delusional, this belief, as many others reported by the patient's father, was part of the village community's shared and common superstitions. Blankenburg thus here differentiates between the conviction to chase the "evil one" out of the barn and the conviction to be able to turn water into gasoline: the first *is socially accessible and shared,* the latter is *not*–rendering the first a mere expression of a socially shared normality and the latter a sign of a pathological loss of this very shared sense of normality. Blankenburg's patient consequently was diagnosed with schizophrenia, received medical and psychotherapeutic treatment and was then reintegrated into his community where he continued working as a farmer (56). However, after the patient committed suicide, Blankenburg hypothesized that despite the treatment and the attempts at reintegration, he still had lost connection to his community.

The emphasis on the importance of social factors for the constitution of and recovery from schizophrenia becomes immediately evident in this example. Another important point is that the distinction between what is normal and what is pathological is not universal, but always relative to the concrete norms and values of a social group and, moreover, to a person's capacity to communicate with these norms. Persons therefore have to grow into these specific norms in order to develop such a sense (i.e., a common sense). The central social institution mediating this process of growing into a social community in Modern Western culture is the family (57). Consequently, the loss of common sense for meaning and interaction can in fact not sufficiently be studied by focusing on the individual experience of the patient – the phenomenological perspective must be extended to the structures of families and subcultures underpinning a person's connection and integration into social interaction. This is the point where Blankenburg's empirical

9 For a differentiation between phenomenological sociology and phenomenology see (49).

10 In the same vein and based on ethnographic observations Thoma (51) has tried to show how the rules and orders of interaction of different social spaces (such as private or public space) are inscribed into our habitual experience and form the sense of our reality.

expansion of the phenomenological approach toward the study of family milieus and subcultures sets in, which we will present in the following section.

Empirical expansion: Studying families of adolescents with schizophrenia

Blankenburg's empirical research on the social constituents of schizophrenic experience is probably one of the most neglected and unnoticed parts of his work, especially at the international level. One reason might be that Blankenburg himself only rarely referred to this research in his publications. Yet, this is surprising since, as we have argued so far, such empirical research appears as a logical consequence of Blankenburg's conceptual reflections.

Since his seminal case study on Anne Rau, Blankenburg's research on schizophrenia focused on adolescents and their families (40, 58). Blankenburg diagnosed Anne Rau as suffering from hebephrenic schizophrenia which (as derived from the Goddess of youth "Hebe" in ancient Greek religion) typically appears in adolescents and young adults (58). Blankenburg considered adolescence "a decisive stage of ego-development" where a person has to position herself toward her social milieu in terms of a 'psycho-social self-definition"' [(58); see also already in (40)]. For him it was thus important to study the *familial context* of those critical cases, where the attempts at such a self-definition coincided with the onset of schizophrenic symptoms. This interest in the familial context also seems to be fuelled by Blankenburg's clinical experience, as he reports: "It is always a deeply moving event when we are able to break through the seemingly extraordinarily 'endogenous' behavior of an adolescent schizophrenic and suddenly discover the bitter seriousness of a life-story problem that could hardly have been guessed at before. [...] In the place of the facetiousness and silly-lappy appearance, a previously completely concealed deep despair suddenly emerges" (58).

One might indeed argue that Blankenburg drew his motivation for understanding patients' social and familial situation not primarily from theoretical reflections but most of all from his clinical experience and encounters with patients. It is here that he saw necessity for broadening the field of explanation to the social sphere, which thus lead him to engage both conceptually and empirically with the field of sociology.

In 1980 Blankenburg hired the trained sociologist Bruno Hildenbrand, who was involved both in clinical and scientific work. In the same year they received funding from the *German Research Foundation* (*Deutsche Forschungsgemeinschaft, DFG*) for a research project entitled "Family situations and orientation of schizophrenics toward the everyday-world" ["Familiensituation und Alltagsweltliche Orientierung Schizophrener," (46)]. The core idea of the project already becomes evident in the title, namely that family context and orientation toward the everyday-world (i.e., the sense of shared normality or common sense) are connected. As Blankenburg explains:

> "The question of disturbances in the orientation toward the everyday-world raises the question of the patient's practice, i.e., how does the patient–in interaction with his closest caregivers, with his family or at work, etc.–construct the world? How is the world constituted for him? How does he constitute the framework in which he encounters the world and himself?" (44)

In order to address this complex question, Blankenburg, Hildenbrand and their colleagues analyzed meaning structures of different families of patients with schizophrenia. They used narrative interviews with family-members about the family-history as empirical methods. This was combined with sociodemographic information about three family generations. Moreover, Blankenburg and his colleagues used participatory observation at home and in the lifeworld of these families, thereby aiming at the description of implicit and explicit rules of interaction and sense-making within the familial and broader social milieu of the participants (46). The researchers also accompanied the participants when moving through the different domains of their lifeworld and simultaneously interviewed them about these domains–a method that today is known as *go alongs* (59). As methodological framework for their empirical investigation, Blankenburg and his colleagues chose a *grounded theory* approach (60), which allowed them to integrate the aforementioned empirical methods. Within this methodological framework, families were recruited for the study in a reiterative process of *Theoretical Sampling* (60) until empirical saturation of the developed concepts was reached[11].

A first aim of the study was to describe typical meaning structures in the families. Yet the focus of the research project, influenced by phenomenological sociology, went beyond the interaction of the patient with his family. The family situation was studied both in its biographical and its specific societal situation, on the basis of which the specific meaning structure of the family was reconstructed (46).

Generally, the results of this study showed that adolescents with schizophrenia experienced a failed process of emancipation from the family and a failed integration into society with its more general and anonymous structures of meaning and interaction (57). Internal-external mediation was identified as a central structural problem in families of adolescents with schizophrenia, i.e., a mediation between the family's private life and space

11 At the time of the study (1983), *grounded theory,* which today has become a standard approach for qualitative research in Germany, was rather unknown to German researchers. Its implementation in the study was essentially promoted by Hildenbrand, who was a friend of one its founders, Anselm Strauss [cf. (61)].

and the external and anonymous social world, serving as the basis for a person's emancipation from her family and allowing or inhibiting her new positioning in the external social world [(62); see also (63)]. Blankenburg and his colleagues observed three different types of structures of meaning or family-milieus characterized by a failed mediation between the inside and the outside of the family system. These structures of meaning were present in the family at the onset of schizophrenia in adolescence (62)[12].

The outwardly demarcated and inwardly centered family milieu (62)

This appeared as the type of family most likely to be found in the case of persons with schizophrenia. It is characterized by the fact that the family-specific construction of reality is at best fragmentarily conveyed to the social environment, the family members cannot adequately relate to societal conditions and to their changes and they are therefore societally isolated.

The outwardly oriented and inwardly disclosed family milieu (62)

This type of family was mainly found among small self-employed people in the tertiary sector, e.g., hotels or restaurants. Family life is reduced to formal relationships with highly structured interaction contexts. Relationships within the family consist of formal working relationships. Milieus directly related to the family in the sense of a non-business-related network of the family, which could compensate for the lack of milieu-like forms of interaction, are largely absent. Children in these families did not succeed in settling down permanently outside the family, although they constantly made attempts to do so.

The family milieu with a contradictory inner-outer orientation (62)

In this type of family, patterns of orientation and action can be found that are directed toward an increased orientation toward the outside world. In the foreground is the striving for social ascent, which the parents were not able to realize for themselves, or only partially, and which they delegate to their children. This increased external orientation corresponds to a separation from the immediate surroundings of the family, i.e., the village, to whose traditional structures the family is also oriented. The latter is inevitable because the world outside the village, toward which the family–striving for ascent–is oriented, is nevertheless alien and opaque. Two opposing patterns of inner/outer orientation are thus represented simultaneously, without the family being able to decide on one or to develop a practical pattern of orientation and action from both. The children are bound to the traditional patterns of orientation and action in the long term and fail on the path of ascent delegated to them.

Blankenburg and his colleagues explored these family milieus in relation to the evolution of the schizophrenic disorder and drew reflections for possible therapeutic consequences. In Germany, patients with schizophrenia after being hospitalized were often referred to other institutions such as residential family homes (Familienheime), therapeutic communities or other residential homes. Based on the idea that schizophrenia from a socio-dynamic point of view represents a form of failed emancipation from private family-structures into the social and public world, Blankenburg and colleagues thus empirically investigated how these therapeutic institutions might enable or support this delicate transitory process (46, 64). Their basic idea was to consider residential homes as a "therapeutic instrument with specific possible risks and chances" for rehabilitation (64). In the second part of their empirical research project they focused on three types of institutions: first, a transitional facility, which had the structural features of a family home; second, a therapeutic living community founded by a psychologist; and third, a transitional residence centered around the client-therapist relationship and at the same time structuring everyday life through an "explicit, bureaucratically determined therapy programme" (62, 65).

Emancipation means crossing a boundary. To emancipate oneself from what is given in order to construct one's own adult identity and develop a sense for the natural self-evidence can first require the establishment of routined actions and orientations. Among the three institutions under study, Hildenbrand identified the family home as the closest to what he then called a "enacted/staged family" (62). Family homes are small institutions in which up to about ten persons with mental disorders are cared for in the house of a family. They are usually run by the housewife, who is trained as a nurse. It is thus a kind of "artificial family": it is characterized both by private elements of daily being together and trusting each other (in the sense of classical family interaction), and by public elements, since the people employed in the family home perform this function as a professional role with corresponding specifications in a public health facility, alongside their private lives, and do so only for a limited time. One could therefore speak of a paradox of a "temporary family" (62), which enables the residents or patients to make a transition, forcing "permanent negotiation processes between the manager, the residents and the manager's relatives" in the protected area of the family, which offers "opportunities for manifold boundary negotiations" (62). Family homes therefore appeared as especially helpful for persons with schizophrenia to achieve a transition from the family world to the external social world. A problem however was, that this process of transition wasn't therapeutically supervised or integrated, i.e., that there were no professional therapists present at this process in order to circumvent potential pitfalls or failures, as Blankenburg and his colleagues concluded (64).

12 Since the final report of the DFG-project has never been officially published we will in the following cite Hildenbrand's official habilitation treatise essentially summarizing the project's results.

They considered as a consequence of this lack of therapeutic reflection the fact that many residents often and again failed to emancipate themselves from these structures and to orient themselves toward the external world (e.g., live in their own apartment, have a job outside of the institution).

Methodological expansion: A dialectical perspective

Blankenburg's conceptual and empirical expansions of the phenomenological approach were paralleled by a methodological transformation. Blankenburg's introduced and integrated a dialectical perspective which he tried to integrate into psychopathology and therapy–an attempt that is already perceptible in *the loss of natural self-evidence* (40), but more thoroughly explicated in several subsequent studies [(66–68); see also (69)]. Blankenburg's central motive is that in order to understand the nature of a person's suffering it is necessary to take mental disorders not merely as a deficit but as a possible meaningful reaction to and at the same time as negation of a certain norm of health (68): more specifically, as the individual's reaction to challenges in the process of becoming autonomous. Blankenburg makes this claim about mental disorders in general but applies it especially to schizophrenia [see already in (40)]. Thereby Blankenburg's aim is to highlight the positive and creative aspects of mental disorders and to shift the clinician's perspective from a mere and passive suffering to one in that recognizes that a person always makes something out of what she is made into, i.e., that there is always also freedom in mental disorder [cf. (70, 71)]. Blankenburg thus calls for the clinician to change her own perspective and to get rid of a rigid and deficitary view of patients. He calls this negative orientation "an orientation toward the minus," which is usually most common for psychiatry's understanding of mental "illness" (40). In other words, Blankenburg invites psychiatrists to think of mental disorders not as something that can be diagnosed independently of a specific form and norm of mental health: on the contrary, mental disorders are a dialectical and creative reaction to mental health[13].

Another example for a dialectical approach is Blankenburg's concept of the dynamic relation between biography and illness (67, 68, 73). First, he invites professionals to refrain from only detecting deficits and disorders and to view patients' medical history within the context of their biography. Instead of reducing the medical history to a sequence of symptoms, diagnoses and treatments, it should be viewed as an attempt to cope with biographical challenges and thus in constant exchange with personal biography and its meaning. In such a biographical and meaningful context, illness can then be conceived as a dialectical anti-thesis in terms of a *crisis* and *hiatus* in the continuity of someone's life story, calling out for a decision and for projecting a new future. The way in which this decision is made (or avoided) will in return have repercussions on the course of the crisis. Mental disorders and biography thus are to be considered in a reciprocal and dynamic process.

Such a dialectical perspective also has therapeutic implications. Indeed, looking at a mental disorder from the perspective of a possible new future (instead of from the perspective of an unchangeable past) could help patients to actually overcome critical phases. Blankenburg (73) called this attempt the "future perfect-perspective." An example would be to ask patients what use they believed their mental disorder will have had 1 day in the process of becoming autonomous (73). This question actually has two effects, the first being that it can help patients to stop looking at their crisis only from a deficitary point of view in terms of an illness, but instead as something endowed with meaning and potential for further autonomy, since it is embedded in the meaningful context and unfolding of their biography and autonomy. The second effect is that this question can haul them out of their current incapacity to envision an alternative future of their biography (or even a future in general, as is often the case in mental crises) to which the current crisis could also contribute.

In Blankenburg's dialectical approach it also became clear that his explanatory claims follow a teleological rather than etiological logic. Schizophrenic symptoms and experience are not assumed to stem from certain *causes*, yet their emergence is justified within a framework of *reasons and responses*, i.e., to what context can the symptom or experience be considered a meaningful and adaptive reaction (68). Blankenburg acknowledged and stressed the multi-factorial and complex processes that might explain the emergence of the disorder, yet with his approach he particularly recognized the relevance of – and explicitly focused on - the contextual social structures (46, 68, 69, 74). This is in contrast to several phenomenological authors, which – when looking outside the domain of phenomenology – have rather been focused on and encouraged research in the neurobiological field (11, 75–77).

13 It seems that Blankenburg's critique of psychiatric categories puts him in close company to antipsychiatric theories. Indeed, Blankenburg defends antipsychiatry against undifferentiated and vulgar refusal by mainstream-psychiatry, appreciating her dialectical critique of psychiatry, for instance by considering schizophrenia as a "healthy reaction to a pathological structure of society" (68). But Blankenburg is also sceptical of a perspective that merely changes the categories from top to bottom, *reducing* mental illness to mental health and mental health to mental illness, as traditional antipsychiatry sometimes does [(58), cf. (72)]. For Blankenburg, *a dialectical approach essentially is an open question*: It means to widen the clinical perspective towards other perspectives and to a wider context that might determine individual symptoms and phenomena without ever reducing one side to the other.

Last but not least, Blankenburg generally favored a qualitative and idiographic approach, which allows for an in-depth case-to-case analysis and understanding of individual lifeworlds. Refraining from etiological claims, he believed that such an understanding could sensitize clinicians to be sensible to e.g., familial structures of sense-making and could stimulate further research (46, 74).

Part 3: Toward a systemic phenomenological psychiatry

Blankenburg's expansions of phenomenological psychopathology thus put forward a relational and contextual perspective, in which individual symptoms and disturbed experiences are viewed in constant exchange with the social background, reciprocally conditioning one another. Mental disorders aren't thus located within the individual, but necessarily arise from the interplay between individual, social and cultural factors. This relational view in Blankenburg's work is coherent with a systemic understanding of human experience, identity construction and mental disorders. In this last section we thus emphasize the systemic elements present in Blankenburg's work and the links to the field of systemic therapy, and at the same time, also briefly discuss some points of divergence. Finally, we also draw implications for the topic of explanation, suggesting that Blankenburg expanded phenomenological explanatory modes into a systemic direction.

The links and interfaces between Blankenburg's work and current systemic approaches begin at the conceptual level. By expanding his theoretical background to phenomenological sociology Blankenburg drew on seminal works like Berger and Luckmann's *The social construction of reality* (78), which also constitute an important theoretical basis for systemic therapy, especially in the socio-phenomenological tradition, focussing on the social construction of reality rather than looking like radical constructivists at the individual construction of individuality (79). The idea that the subjective experience of a person is always intersubjectively and biographical constituted thus seems to be a first important theoretical common ground.

Blankenburg and his colleagues' research on families with adolescents with schizophrenia is a special case in point: The subjective experience of schizophrenia is tightly related to specific intersubjective family structures and sense-making. Therefore, according to Blankenburg, the phenomenology of schizophrenia is not confined within the individual: On the contrary, it is intersubjectively constituted and embedded (46). A phenomenological investigation thus needs to integrate different perspectives, i.e., of the patient, of the relevant others (e.g., family members), of a cultural background and last but not least, also of the researcher.

Early systemic authors such as Jackson, Haley, Watzlawick and Bateson were highly influenced by Harry Stack Sullivan's *Interpersonal Theory of Psychiatry* (80), who devoted years of clinical and research work to help people with psychotic illnesses, especially with schizophrenia. He was the first psychiatrist to introduce the groundbreaking idea that all psychological disorders have an interpersonal origin and can be understood only with reference to the patient's relational and social context. Consistently with current tenets on psychosis, Sullivan theorized that psychotic breakdown was related to severe interpersonal interference with the person's "self-system," later developed by Laing (81) into *The Divided Self*. The idea of schizophrenia as an extreme defensive identity reaction against family disconfirmatory communication patterns is the core tenet of the early different systemic contributions on the topic, which links the various constructs introduced by each author (Bateson's double bind; Wynne's pseudomutuality; Laing's disconfirmation and mystification . . .).

More than with these communication-oriented models of psychotic family interactions and those further developed by the Palo Alto group (82–84) and by the Milan Approach (85, 86), Blankenburg's explanatory hypothesis relates schizophrenia to specific family structures of meaning that hinder the processes of emancipation. Thus, it strongly resonates with the systemic tradition of multigenerational family therapy, e.g., in the work of Stierlin (63), Bowen (87), Boszormenyi-Nagy and Spark (88).

Similarly, in their family studies, Blankenburg et al. (46) propose that in the case of schizophrenia certain family structures of meaning may hinder the patient's emancipation from them. As a consequence, also the transition into more socially shared and public structures is hindered, which might in turn explain the diminished sense for a shared normality, i.e., common sense. Schizophrenia can thus be understood within the context of a problem or a struggle residing at the broader social level of the family and of her relation to the outer society. In this sense, Blankenburg even suggested to conceive schizophrenia as an attempted solution to a problem in social structures, more specifically to the problem and challenge of emancipation from a specific family milieu (58, 68, 69)[14].

Indeed, Blankenburg and colleagues refer to this literature as part of the theoretical background for their family studies. One of the central concepts in Stierlin's work (63) is *related individuation,* which refers to the possibility of emancipating oneself without breaking up contact, i.e., a middle ground

14 Accordingly, Blankenburg explains: "The 'strength' and 'weakness' of an I must be seen and put into perspective with regard to the integration tasks that are set for a person. (...) Over-adaptation in these patients would then not so much be the direct expression of an absolute primary I-weakness, but rather the expression of a conscious or unconscious capitulation of trust in one's own power to shape oneself in the face of a task that is overwhelming from the outset, and thus the expression of an I that is only relatively too weak" (58).

between what he calls the two transactional modes of binding (with a consequent negation of emancipation) and expelling (with a consequent negation of relation). Related individuation thus means for Stierlin a successful process of emancipation from the original family. If this is hindered, psychological symptoms can arise, which he then also more thoroughly investigates and differentiates in terms of specific familial and multigenerational factors. Drawing on these concepts, some of the current systemic explanatory accounts of schizophrenia similarly conceive of schizophrenia as arising from a problem of emancipation from the original family (89, 90)[15].

Current systemic contributions such as Linares' (91) have abandoned the quest for a specific family structure that can be associated to the onset of psychotic disorders; the family interactional and communicational patterns in the here and now are still considered to be more emblematic of these families' functioning; they are still a source for inspiration and the main therapeutic resource for systemic interventions in these psychopathologies, although very different from early ones, such as counter-paradoxes and therapeutic double binds. Most systemic theories of psychotic disorders still revolve around the triangulatory and hidden process of disconfirmation and disqualification, which, by denying acknowledgment of the patient, undermines their psychological existence and hence their very identity. This is especially dramatic when the family life cycle approaches the stage of the young person's "emancipation" or better, differentiation, and thus the definition of their own identity: an impossible step for the patient's positioning within these family contexts dominated by disconfirmatory patterns.

Drawing on Batesonian intuitions on relational context and meaning, as well as on socio-constructionist developments of the original concept of double bind [i.e., strange reflexive loops, (92)] and Positioning Theory, Ugazio's (79) systemic theory of family semantic polarities fills the gap, linking together each family meaning making with individual positioning (identity) within these conversational contexts. She is able to explain how one person can become ill and not the others: the onset of psychopathology is triggered by the unique and reciprocal positioning that the individual patient and their family members take within the critical meaning in their broader socio-cultural context. By co-positioning along the shared plot of family semantic polarities, each family member binds their identity to the identities of other members occupying different positions: it anchors their interdependent Selves or identities from the very beginning. This intersubjective acknowledgment and recognition is not granted to the future psychotic member.

Thus, current systemic therapeutic approaches to psychosis (91) will systematically promote acknowledgment through a reconfirmation process: although this is carried out differently across different models, it always entails an extended group conversation (family session; Open Dialogue; Soteria house) that finally allows the intersubjective reconfirmation and validation of patient's identity, which was previously denied to them.

Another common ground between Blankenburg's work and systemic approaches is to be found at what we called the methodological level, i.e., the dialectical perspective. By taking a dialectical perspective Blankenburg describes mental disorders in general, and schizophrenia in particular (e.g., in his family studies), as meaningful reactions to certain difficult social circumstances (68). It is thus never about a pathological experience *per se*, but rather about the circular relation between such experience and its context.

Similarly, from a systemic perspective, the key to explaining a symptom is, in the first place, to broaden the inferential field and put it into context (93, 94). We have mentioned in the introduction how explanation through contextualization actually characterizes the very phenomenological method (95). Yet, we argued that Blankenburg, by extending the contextual field beyond the individual (and the dyad), has brought phenomenology even a step closer to this systemic perspective.

A dialectical approach on symptoms as meaningful reactions to difficult situations does not only emphasize their embedded and relational character, but also resonates with another core principle of systemic therapies, namely the idea of symptoms as solution attempts (93, 94). A basic tenet of systemic therapy is that symptoms are constructed as "unconscious" creative - and adaptive - attempts to tackle difficult or even paradoxical relational situations: it thus positively reframes what is usually viewed as a deficit (96, 97). According to this perspective, a patient is thus not reduced to a cluster of symptoms: rather she is viewed as a competent and sensitive individual, thereby automatically shifting the focus from the deficits to the resources and agency of the person. This leads to a depathologizing, empowering and respectful clinical stance, which, as we have outlined above, is notably present also in Blankenburg's work. We have also seen how one consequence of such perspective is a particular orientation toward the future. The imagination and (thereby) actualization of possible future solution scenarios, which takes in Blankenburg's approach the form of a "future perfect-perspective," has the effect of expanding possibilities, activating resources, strengthening motivation for change and finally helping her to unfold her autonomy. Interestingly enough, this is also a typical method of systemic therapy (98).

Blankenburg's dialectical perspective thus entails several aspects, which are in common with a systemic approach. From

15 It is important to notice that by taking into account the broader social dynamics one should avoid the risk of pathologizing the family. Systemic thinking is indeed opposite to the idea of linear causality, i.e. that symptoms may causally be attributed to a deficit either in the person or outside the person (in the family). By now briefly discussing the Blankenburg's methodological expansion, we will show how this nonreductionist and depathologizing view is also to be found in his work.

these aspects a particular kind of explanatory modality might emerge, which is not only focussed on the past, but also oriented toward the present or future: indeed, by understanding and explaining mental disorders as meaningful reactions and even solution attempts to difficult circumstances the focus is not on the "why," but on the "what for." Thus, as also outlined above, in his phenomenological account, Blankenburg did not only extend the field of explanatory inference to the social structures but – one might argue – he also pointed toward a teleological explanatory mode, which focuses on the motivation and reasons instead of the causes (etiology) (74). Once more, Blankenburg's work thus aligns with recent systemic therapy contributions focused on meaning making (91–93).

Yet, despite the important similarities, a notable difference between Blankenburg's and systemic explanations is worth mentioning. Indeed, although Blankenburg recognized the meaningfulness of symptoms within their social context, he still sees schizophrenia as a *loss* of common sense, i.e., as a pathological loss of the shared sense of normality (see above, e.g. p. 5). Going back to the farmer's son example in section Phenomenological Psychiatry and the Problem of Individualism, from a systemic perspective one would not only assume that psychotic responses make sense (are coherent and "logical") within their context's meaning making and communicational patterns–as Blankenburg also does–but also that the perceived loss of meaning is only apparent or temporary. A systemic approach would thus maintain that the farmer's son in fact still has a "sense of shared normality" but that he needs to communicate in different ways that prima facie appear incomprehensible. The non-accessibility of communication is thus not to be conceived as a "loss" of something but–also here–as a creative solution: e.g., it's a paradoxical and metaphoric communication if metacommunication is not possible (see original double bind concept and its revisitations such as strange reflexive loop). In other words, instead of being a proof of loss of sense for shared normality, schizophrenic symptoms quite to the contrary testify to a strong sensitivity for this normality and its paradoxes.

Given the many points of contact and similarities with a systemic approach one might expect a development of Blankenburg's research and clinical work toward a systemic direction. Interestingly, however, Blankenburg did not follow this route. Although taking part in social psychiatric discussions in the 1990's, his remarks remained by and large restricted to the relation between patient and psychiatrist, with little reference to the aforementioned family studies. Despite his strong sense for the importance of the connection between phenomenological and social and systemic approaches in psychiatry–which is also evident in the extensive literature on the topic he cites–in the last years of his research Blankenburg was more interested in questions of emotivity (99) and temporality (100) and further methodological questions in psychiatry (101).

It is Bruno Hildenbrand who expanded Blankenburg's approach in a systemic direction by a more thorough investigation of social conditions of mental disorders and their therapeutic implications (102–104). By embedding schizophrenic experience into a family milieu that hinders emancipation, Hildebrand especially focuses on institutions that help patients making up for this transitory process and learning to navigate and orient themselves between different structures of interaction (e.g., private and public spaces and interactions). He aims at better understanding how to develop such structures and evaluate their functioning (103). This clinical research resonates with current social psychiatric and systemic approaches to the treatment of schizophrenia like the Soteria Houses, which also aim at creating a safe family-like space for young people experiencing psychosis (105). More broadly Blankenburg's, and subsequently Hildenbrand's, research point to the need of explanatory models and treatment approaches that include (and thus also use the resources of) patients' social context, as it is for instance done in the social network approach of Open Dialogue (106), in which not the individual but her network is seen as the key to understanding and finding new solutions to the patient's problem.

Ultimately, one should also note that not only phenomenological psychiatry has much to gain from systemic approaches but that these approaches, too, may profit from phenomenology. The phenomenological perspective indeed provides an account of the what-it-is-likeness of experience from a first and second person perspective (91), which have been for long time missing in the systemic approach. Even if in more recent constructivist and social constructionist systemic approaches the experience of the person is taken in consideration, most of these approaches are concerned with the narrative level. Phenomenology thus may offer a deeper and more nuanced account that includes the more basic experiential structures of subjectivity and of its social embeddedness.

In this paper we have focussed on the field of phenomenological psychopathology with the question of what types of explanatory modes are put forward in it. First, we showed that phenomenology indeed entails explanatory elements and that those follow a–one might argue–systemic principle of contextualization. Yet, when looking at the inference field of its explanatory accounts, phenomenology has remained mostly individualistic. We thus presented Blankenburg's work as overcoming this impasse and extending phenomenological explanation to broader social and cultural structures of experience. In this sense, we believe that Blankenburg's work is of extreme relevance for the current developments in phenomenological psychopathology and that it may also point out opportunities for further exchange between current phenomenological and systemic thinking in psychiatry.

Author contributions

ST and LG wrote the manuscript, which was revised and approved by MK and LF. All authors contributed to the article and approved the submitted version.

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Enactive and simondonian reflections on mental disorders

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As an alternative to linear and unidimensional perspectives focused mainly on either organic or psychological processes, the enactive approach to life and mind—a branch of 4-E (embodied, embedded, enactive, extended) cognitive theories—offers an integrative framework to study mental disorders that encompasses and articulates organic, sensorimotor, and intersubjective dimensions of embodiment. These three domains are deeply entangled in a non-trivial manner. A question remains on how this systemic and multi-dimensional approach may be applied to our understanding of mental disorders and symptomatic behavior. Drawing on Gilbert Simondon's philosophy of individuation (focusing particularly on the concepts of *tension*, *metastability*, and *preindividual*), we provide some enactive conceptual tools to better understand the dynamic, interactive, and multi-dimensional nature of human bodies in mental disorders and psychopathological symptoms. One of such tools cursiva is sense-making, a key notion that captures the relational process of generating meaning by interacting with the sociomaterial environment. The article analyzes five aspects related to sense-making: temporality, adaptivity, the multiplicity of normativities it involves, the fundamental role of tension, and its participatory character. On this basis, we draw certain implications for our understanding of mental disorders and diverse symptoms, and suggest their interpretation in terms of difficulties to transform tensions and perform individuation processes, which result in a reduction of the field of potentialities for self-individuation and sense-making.

KEYWORDS

enactive cognition, mental disorders, normativity, Simondon, embodiment, metastability, sense-making, adaptivity

Introduction

The biopsychosocial model proposed by Engel (1977) offered relevant ideas to go beyond reductionist approaches in medicine and psychopathology. However, after decades of research and clinical practice following and developing this model, important limitations have been made explicit in diverse fields, including psychiatry: the tendency to prioritize the biological domain in clinical practice, the fragmented application of the "bio," the "psycho" and the "social," the downplay of subjective experiences, and the lack of strong theoretical foundations to continue developing the model, among other limitations (Ghaemi, 2011; Stilwell and Harman, 2019; Mescouto et al., 2022; Aftab and Nielsen, 2021). The enactive approach to life and mind has been proposed as

an alternative to overcome these limitations (Stilwell and Harman, 2019; de Haan, 2020). The notion of embodiment, based on the operational concept of *autonomy*, allows us to investigate human bodies as a complex set of intertwined processes at organic/biological, sensorimotor/psychological, and intersubjective/social dimensions. This framework offers a variety of other operational concepts (e.g., sense-making, agency or adaptivity) that are relevant in health research and practice. At the same time, the enactive approach is grounded in phenomenology, dynamical systems and organizational approaches to biology, offering a solid theoretical background to further develop concepts and ideas and deepen the investigation of human experience (Thompson, 2010; Di Paolo et al., 2017, 2018; Fuchs, 2017; Gallagher, 2017; Varela et al., 2017). Moreover, the enactive approach overcomes several theoretical assumptions that are often implicit in research and clinical practice which often represent a source of additional limitations. The continuity between life and mind and the deep entanglement among dimensions of embodiment overcomes pervading dualisms (i.e., the strict separation of mind and body, physiology and psychology). Individuals are considered as embodied agents rather than as passive bodies that simply react to external stimuli in a predictable and deterministic manner. In contrast with the widespread methodological individualism—the tendency to investigate isolated individuals where the environment plays a secondary modulatory role—human bodies are considered to be constitutively social[1]. Another key aspect is that subjective experience is not relegated in favor of objective measures. Instead, the goal is to seek complementarities and "mutual enlightenment" between first-person and third-person approaches (Gallagher, 1997).

Enactive ideas have been applied in the study of a variety of mental disorders, such as Obsessive-Compulsive Disorder (OCD, de Haan et al., 2013), autism (De Jaegher, 2013) or schizophrenia (Kyselo, 2016; Fuchs and Röhricht, 2017). Other works have developed and applied a systematic enactive model of mental disorders (e.g., Colombetti, 2013; de Haan, 2020; Maiese, 2022; Nielsen, 2020). The path toward an enactive articulation of mental disorders is open and fruitful, but far from being complete. In this work, we provide some reflections on certain topics in mental disorders that we think deserve more attention and clarification, namely temporality, relational aspects (including adaptive and participatory processes), and the integration of multiple normativities through tension.

In this work, we will complement existing enactive proposals on mental disorders by including some concepts from the philosophy of individuation developed by Simondon (1958/2020). The reason to introduce Simondon's philosophy within the debate is twofold. First, he put forward a comprehensive processual and relational ontology—alternative to Whitehead's metaphysics—that is highly compatible with enactive principles [as already suggested in James (2020), Dereclenne (2021), and Di Paolo (2021)]. Second, he provided a theoretical framework, including concepts such as *individuation*, *metastability*, *preindividual*, or *transindividual* that serves to interpret mental disorders in terms of processes occurring at multiple dimensions and timescales[2] and can be inspiring to complement the current enactive theory. Simondon describes living organisms as unfinished entities in an active process of individuation—which we call self-individuation in analogy with the enactive notions of self-production and self-distinction. Self-individuation, however, does not entail a separate, already constituted self externally driving the individuation process, but it underscores the dynamic and historical integration of a variety of conflicting norms that human bodies must continuously manage. Tensions emerge from multiple regulatory demands that pull the system simultaneously in diverse directions, resulting in some degree of incompatibility or conflict between diverging tendencies. This description resonates with the enactive conception of living organisms as tensioned beings struggling between self-maintenance and self-differentiation. This basic tension is a fundamental aspect of living organisms, and not unique to pathological situations. As we will argue, understanding the living being as holding inherent generative tensions fosters a change in our perspective on the meaning of symptoms. Symptoms are no longer understood as deviations from an optimal state, or difficulties in recovering a homeostatic stationary state, but as mechanisms to maintain the tensioned integrity of the individual and as demands for further changes and individuations. We suggest that symptoms and disorders are related to excessive tension and problems or blockages to transform them. Far from providing an exhaustive and definitive enactive definition of mental disorders and symptoms, our goal is to share some preliminary reflections and to provide examples to contribute to existing work, clarifying potential misunderstandings and emphasizing the processual and relational character of mental disorders. Possible implications for clinical practice are briefly discussed.

1 Indeed, some authors in recent enactive works (Di Paolo et al., 2018; Di Paolo and De Jaegher, 2022) are reluctant to use the term "the body" because it leads to a generalized and uniform idea of the body that disregards individual differences in terms of gender, race, ability, and so on. This is why the plural term "bodies" better reflects their concern to particular, diverse, and concrete bodies.

2 It is worth mentioning that Simondon, despite being Canguilhem and Merleau-Ponty's student, did not explicitly address the problem of health and pathology. Although he offered some thoughts on anxiety and psychopathology, his main aim was to elaborate a process-oriented metaphysics to understand the emergence of individuals in relation to their associated milieu, that is, the individuation of all sorts of existing entities (physical, organic, psychic and collective). This process perspective on individuation helps us to understand human beings as continuously self-individuating beings that can undergo different kinds of difficulties and breakdowns in this process. In this work, psychopathology will be understood against the background of this open and active process of self-individuation of human beings.

We begin by introducing the enactive framework and the main concepts that will be employed in this work. We complement these enactive ideas by briefly presenting the philosophy of individuation as developed by Gilbert Simondon and a few notions from his processual ontology. Then, we introduce mental disorders as disorders of sense-making, and we take on our reflections based on five desiderata. (1) Sense-making is a process, which necessarily includes dynamic and historical aspects. (2) Sense-making is relational, and it is better understood in terms of adaptivity rather than as adaptation. (3) Sense-making implies a dynamic integration of multiple norms. (4) Sense-making is a form of individuation, which operates through relatively abrupt transformations of tensions. (5) Sense-making is participatory, which shows the necessity of looking at social interactions and relational patterns as playing a constitutive role in certain symptoms and disorders.

The enactive approach to life and mind

The enactive framework is a branch of the 4E cognition theories (embodied, embedded, extended, and enactive; Newen et al., 2018) that advocates for a naturalistic approach to life and mind. It is fundamentally influenced by organizational approaches to biology, phenomenology, pragmatism, and dynamical systems theory (Thompson, 2010; Di Paolo et al., 2017, 2018; Fuchs, 2017; Gallagher, 2017; Varela et al., 2017). The application of enactive ideas to psychopathology and psychotherapy has a long-standing tradition (Colombetti, 2013; Röhricht et al., 2014; Gallagher and Payne, 2015; Gallagher, 2018; de Haan, 2020; Maiese, 2022), and it is object of discussion in current academic debates (e.g., de Haan, 2021; Nielsen, 2021; García, 2022). Cognition, from an enactive perspective, is defined as *sense-making,* which refers to the possibility of the living organism to meaningfully interact with the environment—which in the case of humans, is a socio-material environment—according to its own needs and goals. The enactive concept of sense-making is coextensive to life[3] and encompasses all mental phenomena, including the affective, experiential, sensorimotor (behavioral), cognitive, and intersubjective domains. Sense-making, from this approach, is always relational and depends on the co-determination or coupling with the environment. Accordingly, mental disorders have been proposed to be disorders of sense-making (de Haan, 2020). In this way, the enactive conception of mental disorders moves away from internalist and individualistic perspectives and attempts to integrate affective, interactive, social, existential, systemic, and environmental aspects in its definition. One of the fundamental aspects of sense-making is that it is a normative process which is co-extensive with the self-individuation of the living being. It is thus grounded in its biological organization.

Proponents of the enactive approach describe living organisms as autonomous (autopoietic) systems that actively build and sustain a certain identity in time—conceived as physical separation from the environment (Maturana, 1975; Varela, 1979; Maturana and Varela, 1980/2012). Autopoietic systems are far-from-equilibrium systems that must counterbalance the natural entropic trends by remaining energetically and materially open, regulating their interactions with the environment without losing their organizational individuality (Di Paolo, 2005). Autopoietic systems are grounded in two basic processes—self-production and self-distinction—that are dialectically articulated in the enactive theory. Processes of self-production (also called self-maintenance) are those that contribute to incorporating elements and resources from the environment to build the structures that are necessary to maintain the viability of the organism. Processes of self-distinction, on the other hand, are those that topologically distinguish the organism from its associated environment. A cell is a typical example. The membrane is built and maintained by the cell itself through its metabolic activity (i.e., self-production) and at the same time, the membrane is responsible for separating the interior and the exterior of the organism (i.e., self-distinction). As self-distinction processes get stronger (e.g., less permeable membrane), the exchanges of matter and energy with the environment are reduced, reducing also its self-maintenance capacities. Meanwhile, self-production is facilitated by increasing the flux of matter and energy with the environment (e.g., making the membrane more permeable), that is, by going against self-distinction. This tension reflects the *precariousness* inherent in life. Unlike computationalist and connectivist views, from an enactive viewpoint precariousness of materiality is a necessary condition for a non-trivial definition of life and cognition in its broad sense. The very materiality of living beings makes life processes to be precarious, that is, to be likely to extinguish unless the self-organization of the living being actively sustains them. Therefore, the organism is in an active self-individuation process to perpetuate its own identity, a process that is grounded in the basic tension between participation and distinction (Kyselo, 2014), between interaction and constitution (De Jaegher and Froese, 2009).

In order to maintain its viability, the living organism is able to create and follow its own norms (or accept norms proposed by others). Indeed, the organism not only interacts reciprocally with the environment (e.g., as the sand that is moved by the wind and impacts the obstacles that it finds in its way), but it is also able to actively and adaptively regulate this interaction according to certain norms. In this regulatory asymmetry

3 This idea is captured by the *life-mind continuity* thesis (Thompson, 2010; Wheeler, 2011; Di Paolo et al., 2017) which proposes that biological and mental phenomena are distinct but deeply interrelated in a complex and non-reductionist manner. It assumes that the same organizational principles that rule life can systematically be extended to account for mental phenomena.

resides the *agency* of the organism (Barandiaran et al., 2009). Within this framework, agency is the capacity to discriminate between what is favorable or desfavorable for the viability of the organism, by dialectically resolving the basic tension between the two fundamental processes of the living, namely self-production and self-distinction. In this way, the organism acquires a perspective on the world, a sense of concern and caring (Colombetti, 2014). The environment is never neutral or inert, but it is affectively valenced according to the organismic needs and norms. Events do matter to the organism. This affective lack of indifference is the precondition for any form of cognition.

The *autonomy* of the organism is instantiated by a set of operationally closed processes, that is, by a set of intertwined processes that are mutually enabling. In an autonomous system, as explained earlier, the network of processes that is operationally closed is also precarious, i.e., it requires exchanges with the environment to endure (e.g., sunlight, oxygen, and nutrients). Importantly, the enactive concept of autonomy involves an active process that allows the organism to build its own identity through meaningful and adaptive interactions with its associated milieu (Varela, 1997; Di Paolo, 2005). In addition to the identity of the whole organism, the technical concept of autonomy allows to define different domains of organization that are co-instantiated in the same individual. For instance, a cell in a multicellular organism, the metabolic system of an animal, sensorimotor habits in mammals, or relational patterns in humans may be partly autonomous. These domains, which can be viewed as partially decoupled systems, influence, enable, and constrain each other but maintain certain autonomy and intrinsic normativities. In consequence, we can speak of different domains of normativities and semi-Minskian agencies and identities that co-exist in the same organism (Minsky, 1988). As we will explain below, this is relevant for elaborating an enactive conception of mental disorders because a usually neglected aspect of normativity is that, as a result of multiple norms that arise simultaneously, it is inherently tensioned.

Based on the notion of autonomy, the enactive framework interprets human bodies as involving three intermingled dimensions: organic, sensorimotor and intersubjective (Thompson and Varela, 2001). Recently, the linguistic dimension has also been proposed as an additional layer displaying autonomy and agency (Di Paolo et al., 2018). The organic dimension of embodiment corresponds to biological autonomy and it is shared with other living organisms. It includes a variety of interrelated processes and cycles such as metabolism, immune networks or hormonal regulations, which occur through fluxes of matter and energy with the environment. The sensorimotor activity of human bodies can also develop autonomy by generating a network of intertwined behavioral patterns that is precarious and operationally closed. This domain includes self-induced neural activity and a variety of cycles and feedback mechanisms that underlie the nervous system (Di Paolo et al., 2017). Habits manifest the autonomy that arises through sensorimotor coordination and perception-action loops, showing a form of autonomy that is dependent but partly decoupled from the biological one (Barandiaran and Di Paolo, 2014). In addition to the organic and sensorimotor dimensions of embodiment, social encounters give rise to another form of autonomy (De Jaegher and Di Paolo, 2007). Relational patterns, social norms, or cultural narratives, emerging from individual sensorimotor activity, can generate a life of their own and deeply influence personal practices through diverse looping effects and circular processes (Egbert and Barandiaran, 2014; Barandiaran, 2017; Fuchs, 2020). In the enactive framework, meaningful social interactions are described as participatory sense-making processes (De Jaegher and Di Paolo, 2007). As a result of interpersonal coordinations, a relational autonomy emerges that, without erasing individual autonomies, enables possibilities of action and meaning that were not accessible to individuals on their own. As a consequence, from an enactive perspective, human bodies are constituted by multi-scale dynamic processes involving a variety of organizational levels that are deeply enmeshed. This formulation overcomes traditional dualisms between mind and body, or between physiology and psychology in the formulations of mental disorders (de Haan, 2020).

The enactive framework emphasizes the necessity of investigating the interactions between processes at different domains taking always into account that they are part of integrated wholes as socially situated human bodies. In fact, the complex entanglement of processes that emerges in living bodies do not interact in a smooth and harmonious manner. There are several normativities at play simultaneously that generate conflicts and tension (e.g., "bad" habits and addictions that go against organic norms). In order to better understand how tension is created, transformed and released in human bodies, and how these processes can go astray in certain cases, in what follows, we will rely on some concepts and ideas from the philosophy of individuation proposed by philosopher Simondon (1958/2020).

Simondon's philosophy of individuation

The ontology that underlies the enactive framework is processual, relational, and holistic (Thompson and Varela, 2001). For this reason, Simondon's ontogenetic metaphysics (1958/2020) is particularly useful to describe certain aspects of sense-making and mental disorders. As introduced before, Simondon coincides with the enactive endeavor of describing human beings (and other living beings in general) as unfinished entities involved in an ongoing process of self-individuation and becoming (Di Paolo, 2021). He invites us to think of the genetic process by which individuals come to being, their

persistence, and their transformations instead of focusing only on finished, static, and self-standing entities. While the ultimate reality is defined in terms of processes, the individual is seen as an abstraction, a momentary and transitional state in the individuation process, an entity that is never fully constituted. The Simondonian ontology is also relational, which implies that relations are not merely links between relata that have a previous or independent existence, but relations are contemporary with the terms they relate and are, thus, constitutive of beings. Our goal is not to present his rich philosophical system in any systematic and exhaustive manner. For present purposes, it suffices to analyze some common points with the enactive perspective and present some concepts and ideas that can contribute to an enactive interpretation of mental disorders and symptoms[4].

Simondon invites us to think of the genetic process by which individuals come to being instead of focusing only on finished and constituted entities (either physical, organic, psychic, or collective). The classical example of physical individuation is crystallization. Simondon claimed that to understand the constituted crystal, we should examine the crystallization process, that is, the phase transition from a supersaturated liquid solution to a crystallized solid structure. The supersaturated solution is in a metastable state, i.e., it shows only a limited degree of stability due to multiple tensions (e.g., forces among molecules in diverse directions). However, the system cannot release these tensions by itself to increase its stability. It requires a trigger. Hence, these tensions lead the system to a state with high sensitivity to external perturbations, i.e., tensions open potentialities for future transformations. Simondon calls the *preindividual* to the field of potentialities for change that transcends and extends the actual individual. Depending on the tensioned state of the liquid, the perturbation, and the environmental conditions, the phase transition will generate a concrete crystal with a certain size and crystallographic structure. The crystal is in another metastable state, but with lower potential energy and less tension than the initial oversaturated solution. At the same time, this process will reduce the preindividual load, the field of future potentialities of the system. Individuation is thus a process of generating structures or functionally distinct metastable states by transforming tension.

In contrast to physical individuation, individuation of the living does not take place in one shot or by combination of free-floating elements, but entails a progressive process. In the case of living organisms, self-individuating activity can be conceived as occurring in steps, each step transforming a certain amount of tension—but without exhausting all the tension and potentialities in the process. Living beings not only transform and release tension, they must also regenerate it in order to keep the system metastable and malleable (i.e., alive). They must actively interact with the environment to create and transform tension, exchanging matter and energy, and opening potentialities for future transformation. The metastable character of living beings is due to the preservation of a preindividual load, that is, a certain charge of potential energy that exceeds their organizational structure. According to Simondon, the self-individuation activity of the organism and, subsequently, sense-making operates through transitions between metastable states (Di Paolo et al., 2017).

Metastability in physics is defined as an energetic state of a dynamical system that does not correspond to the state of least energy. It is often related to conditions of unstable equilibrium and available potential energy. Through this concept, we want to highlight the malleable, adaptive and dynamical character of human bodies in relation to the notion of tension, that is, their potential for transformation. If there is no tension, there are no potentialities and there is no drive for individuation. In other words, stable equilibrium implies death. One way in which humans maintain those potentials open for future transformations is by keeping the system open to new domains of interactions with the environment in a process that is comparable with biological neotenization (Di Paolo, 2021). This implies slowing down biological development, which gives room to more sophisticated forms of cognitive functions. The biological vulnerability of humans in early life would not be possible without a high level of sociality. Conversely, that biological vulnerability opens domains of problematization (i.e., tensions) in the collective, giving rise to more complex social interactions. In this way, renewal of tension in humans takes place in the form of participation in the collective, learning new skills, engaging in intersubjective dialogue, or participating in a variety of groups.

In fact, in addition to physical individuation (generating material things) and living individuation (giving rise to biological organisms), Simondon also describes psychic individuation (which gives rise to perceptions, actions, emotions, memories, thoughts and so on) and collective individuation (which results in values, institutions, language, science, religions, or artistic works). Simondon describes psychic individuation as a way of solving a certain problem or tension in a higher dimension because it cannot be solved through a living individuation. It is important to remark that psychic individuation and collective individuation are tightly linked, although they do not necessarily happen simultaneously. Perception is clearly influenced by culture and social aspects, and at the same time collective individuation processes do depend on individual perceptions and actions.

This idea is captured by Simondon's concept of *transindividuality* and it refers to the fact that our shared

4 For a more exhaustive presentation of Simondon's philosophy, we address the reader to Scott (2014) and Bardin (2015).

affects and coordinated behavior imply the possibility of participating in the other's individuation and becoming (Heredia, 2015). Transindividuality, thus, implies participation in and modulation of others' potential for change, that is, the modulation in the anticipatory character of other's sense-making, opening potentialities for new meanings and actions that were not available to individuals on their own. Moreover, what this perspective questions is the idea that the two selves are fully individuated and self-acting and self-containing prior to intersubjective participation and interaction. In other words, interpersonal participation is not just something we as fully constituted subjects do, but something that constitutes us, like sensorimotor and organic processes do. This implies that in addition to viewing how the relational domain emerges from complex and dynamic causal interactions between individuals, we should also examine the global to local processes by which individuals individuate from the relational domain. In this way, gaining awareness of the degree of participation of the therapist in the individuation of the patient may open up more or less potentialities for co-transformation and change.

In other words, for Simondon, the individual is not the starting point of his investigations, but an effect of a continuous activity. Transindividuality is not the opposed relation between two already constituted terms, individuals and collectivities, but it articulates the relation of the individual with itself, with other individuals and the relation between different collectivities. This possibility arises due to the preindividual of each individual, the load of potentialities, which remains unindividuates and is partly shared with others. The most clear example of the transindividual is language. Language is an open system that changes with its use. It is not only the effect of individual behaviors, but also constitutes individuals by establishing a set of relations and structures that pre-configure the individual psyche. The transindividual character of humans thus refers to the inevitable participation in a variety of collective habits, norms and systems of value. Just like many different autonomous semi-Minskians agencies constitute and co-exist within the individual, which may pull the system in different directions by exerting opposing normative demands, a person also belongs to different social groups, whose norms may be in contradiction with each other. The participation in the social, then, is not univocal or homogeneous either, but tensioned, situated and highly dynamic.

The enactive approach and Simondon are indirectly related through the field of cybernetics, and their attempt of extending concepts and ideas from mathematics and engineering (control, stability, circularity, information) to biology and cognition. Enactive cognitive science can be considered as a branch of second-order cybernetics (Froese, 2010), while Simondon established dialogues with authors of the first wave of cybernetics (e.g., Wiener) and tried to go beyond their notions of adaptation and information[5]. We find strong similarities between the simondonian philosophy of individuation and the enactive approach. First, the preindividual, that is, the excess of virtuality inherent to the actual individual, is a fundamental aspect of sense-making and *adaptivity* (Di Paolo, 2005). Adaptivity refers to the capacity of determining future potential trajectories (shaped by the current organizational structure), evaluating them according to the norms of the organism and its viability conditions, and regulating the interaction with the environment accordingly (Froese and Ziemke, 2009). The living organism is one that can evaluate not only its actual states, but also its tendencies and potential directions. Being sensitive to potential challenges and risks, it can regulate its activity and its interactions to avoid, limit or compensate for potential challenges to its viability conditions. Second, affectivity plays a crucial role in simondonian philosophy and it is tightly linked to collective individuation and participatory processes. Several interpretations of the simondonian perspective on affects point to their function of ordering disparate affective forces in a coherent positive-negative, pleasant-unpleasant, proximal-distal polar axis (Massumi, 1995; Heredia, 2012; Wrbouschek and Slunecko, 2021). Affects thus play a crucial role in relating the individual with its preindividual, i.e., with the set of available potentialities (Heredia, 2012). In this way, affects and emotions reflect also the transindividual character of humans. While affects manifest the relation of the individual with itself, emotions are collective stabilizations of affects and reflect the unity of the psychosocial activity. Affects and emotions are not fundamentally distinct, but emotions are collective stabilizations of affects. They face the problematic of the subject, that is, the fact that the subject is inherently individual and collective at the same time and, as such, it needs to appeal to the collective to self-individuate, that is, to feel oneself (Tucker, 2022). In the same line, the enactive notion of adaptivity, as a form of responding as a whole to virtual trajectories of the system, is inherently affective, not only in virtue of distinguishing between positive and negative tendencies, but also in virtue of integrating the disparate affective forces, sometimes responding to different normative domains. Third, the perspective on metastability aptly describes the dynamics of sense-making. Indeed, sense-making aims to capture the transitions between

5 Origination of new norms and the emergence of novelty (invention) is hampered by a notion of information limited to the Mathematical Theory of Communication proposed by Shannon (1948). According to this view, information is constrained to uncertainty and it flows within closed systems that include feedback loops while the transmission medium remains unchanged. For Simondon (who defended his thesis *Individuation in Light of Notions of Form and Information* in 1958), information cannot be reduced to the transmission of a signal between two fixed entities. Instead, he proposes the transductive operation, i.e., what is transmitted is a pattern of change that modifies the medium itself—for instance the crystal lattice that extends from the germ along the crystallization axis transforming the solution. This conception of information gives room to invention and historicity in the system (Iliadis, 2013).

dynamic states, rather than stationary states of functioning—what traditionally have been called "mental states". Fourth, the self-organization and continuous renewal of tension that is present in organic individuation resonates with the enactive concept of autonomy. Living, psychic and collective (plus physical) individuation processes are deeply intertwined and follow similar logics, in line with the intermingled dimensions of embodiment (organic, sensorimotor, and intersubjective) based on the enactive autonomy and the life-mind continuity thesis. Therefore, without entering in depth in the philosophy of Simondon, we can see that some of his concepts and ideas, while being compatible with the enactive approach, offer a novel perspective or a view from a different angle that can be inspiring. Such a different point of view can complement the enactive theoretical framework and will allow us to better describe certain processes related to mental disorders.

This processual and relational perspective based on metastability, tension and individuation processes encourages a significant change from approaches to life based on homeostasis (or allostasis). Homeostasis refers to the optimal steady state of an organism, where internal variables are maintained in a certain range that favors the viability of the organism. Interactions with the environment are seen as perturbations altering this state that the organism must compensate for. In contrast with this static view, the notion of allostasis corresponds to stability through change, including the capacity of the organism to predict future events and produce changes in an anticipative manner. These notions, together with feedback loops, have been very successful in physiology, and they are still widely employed in clinical practice (e.g., to treat hormonal disbalances). However, and despite homeostasis, allostasis and feedback loops seem adequate to describe the regulation of local variables in a flat chain or short timescales, they cannot capture the full complexity of the organization of living beings and their regulation mechanisms (Bich et al., 2020; Bardin and Ferrari, 2022). This is especially problematic in long-term processes. Therefore, the extrapolation of these concepts coined in physiology to explain and treat mental disorders have strong limitations. Arguably, growth and transformation are fundamental for self-individuation of living beings, not only subsistence. This feature requires adopting a historical path-dependent perspective. While the homeostatic and allostatic views emphasize stability (constant or through changes) and relegate regulatory mechanisms to balance (potentially) altered variables, the metastable perspective would emphasize transformation, claiming that there is no stable state to which the organism should go back. Instead, progressive states of partial, momentary and precarious stability are sustained as a result of opposing regulatory demands. If an homeostatic stable state can be described, it is a local homeostasis sustained by a variety of forces and tendencies that pull the system in different directions. That is, temporarily identifiable stable structures that emerge from the integration of dynamical processes in a given localized domain[6]

The transformative character of the living organism, that is, the character of being directed toward virtuality, is a manifestation of its temporal asymmetry. This implies that living organisms are not only temporal but also historical (Di Paolo et al., 2021). Living processes do not only compensate for each (potential) perturbation. Each interaction with the environment, each transition between metastable states, can alter the potentialities available for the future (the preindividual). Neural plasticity, development, incorporation of new habits, personality, intersubjective relationships and so on are historical because they allow for cumulative change and transformation. Every (step of) individuation reduces the variety of potential trajectories to one actual state while opening up new paths for future individuation. Accordingly, sense-making does not occur anew, but strongly depends on the particular history of organism-environment couplings and their mutually constructed dynamical dependencies. Those dependencies may encompass processes along different timescales, basic processes being entrained by larger-scale processes. This allows us to identify a multiplicity of temporal scales in sense-making. For instance, identifying a movement not only as a mere movement, but as an intentional act with diverse possibilities for meaning depending on the scale and the context (e.g., shaking hands between two politicians). This historicity of sense-making is what confers a particular, concrete, and unique perspective to the individual. As a result, investigating particular embodied and situated experiences is fundamental in order to account for the variability and diversity in mental disorders and human life in general.

In sum, from the enactive and simondonian perspective developed here, living beings (and humans) are open, indeterminate, and historical beings in a constant process of self-individuation. In addition to its current state, the individual also involves its history, with the results of cumulative individuation processes and partial tension resolutions, and the set of preindividual potentialities that are still open and keep it alive.

Mental disorders as disorders of sense-making

A core tenet of the enactive approach is that the mind is not located in the brain, but emerges from the embodied interaction

6 For instance, think in the opposite role of hormones insulin and glucagon in glycemia. The absence of any of these hormones would be fatal for the organism. Both are necessary to regulate sugar levels in the bloodstream and maintain them in homeostatic ranges. However, these hormones are immersed in a myriad of processes that take in part in glycemia regulation, and looking only at them and their feedback loops is a simplification that might be useful in certain cases but that also has limitations.

of the agent with its environment. Mental disorders, then, cannot be reduced to direct consequences of brain disorders, nor to mere social constructs. They should be understood in terms of non-linear, highly complex interactions between organic, sensorimotor, and intersubjective transactions with the environment (de Haan, 2020). Moreover, the entanglement of different dimensions of embodiment implies that there is no privileged description or dimension to define pathology (Mc Gann and Cummins, 2013). Indeed, the categorical distinction between somatic and mental disorders loses its grounds in this framework. All health problems may be seen as disorders of sense-making in a broad sense as they all involve organic, sensorimotor and intersubjective aspects (even if in different degrees or contributions). However, this is not the same as claiming that every domain has the same importance in every case. Some disorders may benefit from an intervention at the physiological level (e.g., pharmacological), others may improve with a therapy at the psychological domain (e.g., psychotherapy), and other conditions may require influences at different dimensions (e.g., socio-community interventions). And a combination of interventions at diverse dimensions simultaneously may be useful as well. It is important to notice that interventions in a concrete realm often have strong influences in other dimensions. A physical intervention (e.g., a surgery) is not only affecting the organic body. A surgery may have a profound impact in the sensorimotor and social domains, as it may involve sensorimotor limitations and changes in the social environment (e.g., being at a hospital, enhanced social support) that can modify the way of life of patients. At the same time, a sensorimotor intervention may help without directly affecting physiological conditions. In patients with arterial disease in the lower limbs, walking therapy can contribute to reduce pain, increase walking capacities and improve their life—without directly intervening in the arteries. The success of walking therapy, moreover, depends on the trainer and her effort, showing again the deep interrelation among dimensions of embodiment (Mol, 2002).

The enactive framework and the ideas from the philosophy of Simondon presented here allow us to elaborate on what has already been said on disorders of sense-making. We want to focus on five aspects that are relevant for our purposes: temporality, the relational aspect of sense-making, normativity, tension and participation.

Sense-making is a process: dynamics and historicity

The processual and relational nature of the enactive approach and the philosophy of individuation developed by Simondon encourages us to shift the perspective on mental disorders from states-like entities occurring in passive individuals toward dynamical and interactive processes enacted by socially situated embodied agents. Accordingly, mental disorders should not be described (only) in terms of their structural, static and individualistic aspects, but as *processes* that individuals undergo in interaction with their associated sociomaterial environment. Mental disorders have an inexorable temporal dimension and identifiable time courses, where we can distinguish stages, relapses, and recovery tendencies (e.g., panic attacks are more rapid and acute than depressive processes). From our perspective, the temporal course of mental disorders should be seen as intrinsic to what they are.

We suggest that any classificatory system—either the RDoC project (Cuthbert, 2014), the ICD-11 (WHO, 2014, 2020) or the DSM system (American Psychiatric Association, 2013)—would benefit from paying more attention to the temporal dimension in their definitions, rather than focusing mostly on the set of symptoms—what has been called the "homeostatic property cluster" (Kendler, 2016). Indeed, many subclinical disorders and affective episodes can be viewed as processes that a person undergoes rather than fixed and static properties (e.g., stress, anxiety, or non-chronic depression). These experiences can become clinical disorders if they surpass a certain intensity threshold, extend for a certain period of time, or appear with a determined frequency. The DSM-5 already considers frequency and duration of observable symptoms in establishing the severity of certain pathologies (American Psychiatric Association, 2013). However, beyond frequency and duration, we claim that mental disorders manifest identifiable dynamical patterns of development and recovery which should be considered as inherent of what they are. For instance, depression shows emotional inertia toward a negative mood sustained by feedback loops, which favor profound relapses that extend in time (Demic and Cheng, 2014; Hayes et al., 2015). Conversely, anxiety disorders show larger mood variability and instability (Lamers et al., 2018). In turn, schizophrenic patients may show long periods of prodromal phase before active psychotic episodes appear and also long periods of remission sometimes accompanied by post-psychotic depression (Moritz et al., 2019). The intrinsic temporality of each disorder is different and crucial to understand many of them. As a result, a process perspective on mental disorders would allow us to move away from the relatively fixed and stable categories and the reificating tendency of looking at mental disorders as natural kinds. The enactive framework would maintain a realist perspective on mental disorders without describing itself to substantialism or essentialism (Zachar, 2000; Kincaid and Sullivan, 2014; de Haan, 2020).

This dynamical perspective goes along with the change process research in psychotherapy (Elliott, 2010). Attending to the time-course of the emergence, persistence, and decay of certain psychopathologies allows identifying the interconnection between short-term and long-term effects of therapeutic changes and recoveries (Hayes et al., 2007, 2015; Schiepek et al., 2017). Indeed, the non-linearity of

therapeutic changes, — i.e., the more or less abrupt transitions between relatively stable phases along the therapeutic process (Gelo and Salvatore, 2016)—is very likely to be influenced by the inherent temporal rhythm of the disorder itself. This process perspective on mental disorders may allow us to build individualized models of disordered patterns and may facilitate a transdiagnostic understanding of psychopathology and the therapeutic process (Salvatore et al., 2015; Nelson et al., 2017).

In addition to incorporating dynamical aspects, we also suggest viewing therapeutic processes and mental disorders as path-dependent. This means that mental disorders are cumulative and non-homomeric processes—i.e., they can be described in phases [building on the typology of processes developed in Seibt (2004)]. A relapse in an addiction rehabilitation process does not place the patient in the same state as in the beginning. Mental disorders (and life in general) involve irreversible processes where there is a progressive cumulation of changes. In addictions, for instance, a relapse typically entails a decay in the confidence of self-capacities to attain the therapeutic goals, involving a negative feedback loop that hampers future change processes. Being so, the therapeutic strategy should not only rely on the diagnosis and the current symptomatology of the patient, but should consider the trajectory of the person, how the disorder has evolved, and the history of interpersonal interactions that have led the person to the current situation. This is indeed a common practice in most forms of psychotherapy. What is missing, we believe, is the theoretical, epistemological and even ontological description of mental disorders as path-dependent, heteromeric, recurrent, and non-linear processes. This perspective allows us to move away from the static and reifying approach promoted by current classificatory systems.

Sense-making is relational: adaptation vs. adaptivity

The downplay of the dynamical and historical nature of mental processes is likely to be related to the popular view of life and health in terms of adaptation and homeostasis. The homeostatic view presupposes an optimal stationary state to which the organism should return, usually based on statistical normality (Boorse, 1977). When the interaction with the environment is taken into account, health and disease are typically interpreted in terms of *adaptation*, that is, the ability of the organism to flexibly adjust to different internal and external conditions. As a result, pathological dysfunctions are seen as failures in fulfilling the adaptive function (e.g., Selye, 1975; Kovács, 1998; Beck et al., 2021).

However, we should distinguish adaptation from the notion of *adaptivity* developed within the enactive framework (Di Paolo, 2005). While adaptation implies a changing environment to which the organism should adjust, adaptivity has to do with the ability of anticipating potentially undesirable trajectories in the organism-environment couplings and regulating the interaction accordingly. There is a difference between coping with the environment in a purely reactive manner and modifying the coupling itself or generating supportive environments. While adaptation implies intervention to counterbalance external changes, minimizing its effects in order to maintain a stable internal milieu, adaptive regulation implies maintaining certain internal flexibility, regulating the interaction with the external world, or even intervening in the environment. To put it succinctly, adaptivity implies taking advantage of change rather than merely preventing it (Menatti et al., 2022).

There are convincing reasons to avoid the adaptation criterion in the definition of mental disorders. The main concern is that, as repeatedly pointed out by the anti-psychiatry movement (Cooper, 1967/2013) and more recently by the neurodivergence movement (Dyck and Russell, 2020), the adaptation criterion can promote pathologizing individual suffering heavily influenced by social structures. Indeed, one can be maladaptive without being pathological and pathological without being maladaptive, as in cases of social success (e.g., in academic work) at the expense of stress and anxiety. Similarly, contestation or lack of adaptation to authoritative social structures should not be regarded as pathological. In addition, if we assume the relational ontology proposed by the enactive approach, there is no fully-constituted organism that needs to adapt to an *a priori* constituted environment, but a mutual co-constitution of organism and environment. The adaptation criterion oversees the mutual transformation and feedback loops between organism and environment, sometimes formulated as the niche-construction activity of the organism which modifies the sociomaterial environment and constraints, bootstraps, and modulates its own behavior (Laland and O'brien, 2011). If we assume the active role played by the individual in anticipating and modifying its coupling with the environment, then health is not only related to the responsive capacity of the individual, but with its preventive capacities. A similar shift from adaptation to adaptivity can be seen in discourses promoting a preventive medicine over treatment-based medicine (Larson, 1999; Menatti et al., 2022).

As a result, adaptation may be neither necessary nor sufficient to define mental disorders. An organism can be structurally non-adapted in a concrete moment but organizationally adaptive, that is, it can manifest adaptive behavior even if it is not properly adjusted to the actual situation. Adaptivity also operates over virtuality, at the level of the preindividual, by anticipating and modifying the field of potentialities of becoming. If there is maladaptation in certain psychopathologies, we suggest it may be in virtue of a lack of coherence in the individuation process between the actual and the potential, between the current state and virtual possibilities for the future. This might be related to an overly rigid or overly

flexible sense-making that does not integrate diverse norms and needs that traverse the individual (we will unpack this idea in the next section).

To put it succinctly, the enactive approach advocates for a processual and relational perspective on pathologies that is sensitive to the historical aspect of living organisms. Accordingly, the relationality of mental disorders should not be understood as a relation between fully constituted and static individuals and environments, but as dynamically changing and mutually constraining processes that are path-dependent. The proposal is to look at the (pathological) organism-environment relationship as an emergent product of the self-individuation process of the individual.

Sense-making involves managing multiple norms

A classical way of understanding pathology has been as an impairment of building and following one's own norms. This formulation—first made by Canguilhem (1966/2012) and more recently endorsed by Nielsen and Ward (2020)—overcomes the limitations of defining health and disease in terms of external norms (e.g., social values, statistical normality). From this perspective, psychopathology would imply a systematic or structural break of the functional norms and values of the individual. This form of naturalized normativity, however, bears the risk of understanding living processes in overly functionalist terms (de Haan, 2021). Simondon's distinction between norms and values is relevant here (see also Di Paolo and De Jaegher, 2022). While norms can be understood as referring to the function of an individuated (stationary) system, values refer to the forces that drive individuation processes, which are operationally (rather than structurally) defined and, as such, can be seen as the genesis of norms. Values thus correspond to acts and operations occurring at the transitions from one metastable state to another, from one logic of functioning to another. Accordingly, they do not follow a close system of norms. Instead, values express a relation between current and potential states. Simondon puts forward an axiology that gives room for the invention and generation of new norms[7]. Following this perspective, we point out that normativity does not exist in the abstract in the form of *a priori* set of rules the organism must follow. The whole system instantiates a norm of self-maintenance by being operationally closed, but the norm is not in the mechanism or purposes of the system. Rather, norms should be understood as emergent phenomena that are linked to sets of possibilities for action and change in the system; that is, norms are situated and concrete actualizations (Di Paolo et al., 2010). The norms of the system should be understood as moment-to-moment evaluations of the matrix of possible actions, rather than as general and abstract rules that particular actions must follow. Norms are explored through meaningful interactions with the environment that generate tensions, and in permanent negotiation to transform tension and minimize conflicts. Those matrices are balanced according to the self-individuation tendencies of the organism, its actual state and potentials, and long-term goals. They provide directionality to the individuation of the system while encompassing diverse time-scales.

Moreover, the enactive approach wants to acknowledge the multiplicity of entangled normativities of the human form of life. Organic self-maintenance, we argue, should not be seen as the reference rule to which all norms subsume. Indeed, many human behaviors, which should not be seen as pathological, go against basic or organic norms, by postposing certain biological demands in favor of the attainment of longer term goals. If we assume the enactive proposal of looking at distributed normative semi-Minskian agencies, then there would not be a static, integrated, and coherent norm (or sets of norms) that drives the organism—and whose breakdown would indicate pathology. Accordingly, health and pathology should be distinguished in terms of the moment by moment emergent clusters of norms that evaluate the current situation the organism is embedded in. A clear example is fasting, which can go against a basic organic norm of nutrition if it extends for too long. Nevertheless, fasting by itself does not indicate pathology, nor is pathology defined in terms of the underlying causes that generate fasting behavior. In order to consider a certain behavior a pathological symptom, we need to look at the distribution of the whole network of norms. In anorexia, for instance, we can identify two sets of norms that are in conflict; namely, the normativity of the body as a living organism with its nutritional needs and the normativity of the body as an object of self-concept which is strongly influenced by social norms. Fasting can be motivated by religious beliefs (i.e., a social norm) as well, and can be neutral, beneficial or a source of pathology depending on the extension, the previous health situation and the activities and responsibilities during the process (e.g., physical work). Pathology, thus, is not located in the breakdown of a single norm but in the network of norms that traverse the individual.

Addictions represent another example of the simultaneous emergence of multiple normativities, which are often in tension or generate internal conflict. For instance, smoking, being a sensorimotor habit that damages the respiratory system, creates a tension between normativities related to sensorimotor and organic dimensions of embodiment. In the example of smoking, we can also find conflictive norms at the organic dimension of embodiment, as it is detrimental for the respiratory system but the need of nicotine can become an established regulatory

7 A clear example is technical normativity, where the production and use of technical objects yields to the emergence of a new normativity in the collective (Bardin, 2015). Artifacts shape collective and individual agents' norms of actions, habits and action-perception patterns.

mechanism at the organic level, whose breakdown triggers abstinence symptoms. The sensorimotor act of smoking already constitutes a self-sustained behavioral pattern that develops its own autonomy (Ramírez-Vizcaya and Froese, 2019). This is why people in the process of quitting try to substitute the habit by keeping the sensorimotor pattern, usually bringing something to the mouth (e.g., eating candies). At the intersubjective domain, smoking might help the socialization process (e.g., generating a sense of belonging to a social group in teenagers) or it can be a resource to regulate interpersonal interactions (e.g., leaving momentarily social encounters or atmospheres that are uncomfortable with the excuse of smoking). All three dimensions of embodiment and their distribution of norms should be considered in our understanding of addictions. Looking at the network of sensorimotor schemes and at the interrelated intersubjective realm where the habit is immersed can be very useful to recognize situations that entail the danger of smoking (e.g., excessive workload, working environment, family meetings, or interpersonal encounters with some friends).

In sum, we advocate for a perspective on normativity based on the continuous integration of a variety of norms—local, dynamic and focused toward the future—that can be in conflict or show some degree of incompatibility. In order to better investigate this process we develop the notions of tension and individuation processes in the next section.

Life and sense-making are driven by tension

Disease and illness, including mental disorders, are usually associated with tension and imbalance, often involving a lack or an excess (e.g., an excess of meaning in psychotic experiences, lack of certain neurotransmitters in depression), a dysfunction or an overfunction (e.g., dysfunction of the theory of mind module in autism, dysfunction of self-control mechanisms in addictions, excessive self-reflection in OCD).

From the enactive-simondonian perspective displayed here, tension is not exclusive to disease and illness, but ubiquitous in living bodies. Through the interaction with its associated environment, a living body is in a permanent, although dynamic, situation of tension and critical imbalance that drives self-individuation. As a consequence, tensions should be considered as inherent aspects of life, rather than as negative situations arising in a broken, out of balance or malfunctioning body. Illustrative examples are the necessity of being in contact with all sorts of pathogens in early phases of life to build the immune system (Brodin and Davis, 2017), the need of a certain degree of affective variability to flexibly attune to changing situational demands (Chan et al., 2016), and the need of interactive breakdowns and recoveries to mutually readjust in therapeutic processes (Safran et al., 2001; García and Di Paolo, 2018). Living beings are precarious, which implies that all living processes, taken in isolation, would lead the system to its death unless the whole self-organization of the living compensates for them.

In order to better understand the dynamics of tension creation and transformation it seems necessary to investigate how tension emerges. Tension appears when multiple regulatory demands arise simultaneously in a non-harmonious manner. There are a variety of norms that can arise simultaneously, and some of them can be completely or partially incompatible or mutually exclusive with each other. In human bodies, tensions are present at different organizational levels, both intra-level and inter-level. They arise at the organic level, for instance, between hormones with antagonistic effects (e.g., insulin and glucagon, parathyroid hormone and calcitonin), between sympathetic and parasympathetic nervous activity, or between cells with opposing roles (e.g., osteoclasts and osteoblasts). Likewise, the sensorimotor dimension displays tension between flexor and extensor musculature, or among the variety of actions available for an active embodied agent with a particular sensorimotor repertoire in a certain context. At the intersubjective dimension, we also find a deep tension between individual and relational needs that permeates all social interactions (Kyselo, 2014) as well as between behavioral demands of different social systems one may belong to Di Paolo et al. (2018). Moreover, tension can also emerge among conflicting normativies at different dimensions, as demonstrated by the difficulties to eliminate "bad" habits and harmful addictions. Going back to the example of smoking introduced earlier, the difficulty of changing habits is a clear example of tension between dimensions of embodiment, and also between pre-reflective and reflective activity (Gallagher, 2012). The reflective intention to quit smoking is necessary, but not always sufficient to overcome the pre-reflective impulse to maintain the habit[8]. Indeed, metastability and tension pervade all domains of reality and describe individuation processes in general. For instance, the dynamics of an argument between two people can also be studied in terms of metastability where small interventions might lead a couple to split up, to reach a partial consensus or to keep arguing (Veitas and Weinbaum, 2017).

Perhaps the best example of tension in the human body is pain, which clearly shows how deeply enmeshed the three dimensions of embodiment are (Stilwell and Harman, 2019; Coninx and Stilwell, 2021; Miyahara, 2021). Pain, for instance, is a fundamental process of embodied experience that can both affect and be affected by organic (e.g., tissue damage), sensorimotor (e.g., physical activity) and intersubjective processes (e.g., social support). Pain is also considered a drive for change (Quintner et al., 2008), that is, a trigger to modify the current set of tensions of the living body.

8 The tension generated by reflective and pre-reflective forms of experience may be particularly relevant to analyze therapeutic interventions (García, 2021), but a thorough analysis of reflective/pre-reflective processes goes beyond the scope of this article.

Despite tension being an intrinsic part of biological and mental processes, how tension is created, transformed and released can shed light on symptoms and mental disorders. From this perspective, some mental disorders can be interpreted as involving a metastable state with an excess of tension or with difficulties to trigger an individuation process that transforms and releases tension. For instance, phobias, Obsessive Compulsive Disorder (OCD) or Post-Traumatic Stress Disorder (PTSD) can be seen as generating an amount of tension that is excessive and not in accordance with external situations. These conditions may benefit from a gradual exposure that aims at reducing the sensitivity to situations that trigger excessive tension (Craske et al., 2014). In the same vein, addictions often require withdrawing from certain contexts that generate excessive tension and favor addictive behavior (a bar for an alcoholic, a mall for an addict to shopping or a group that facilitates addictive consumption or activity), and gradual exposure once they have developed skills to manage tension and better cope with these situations. In contrast with these conditions, Borderline Personality Disorder (BPD) can be interpreted as a blockage to transform tension. In this case, patients manifest difficulties in integrating contradictory aspects and tendencies and building a coherent narrative of the self (Fuchs, 2007). The amount of tension created in this case is not specially large, but the individual may not have the capacity to manage interpersonal difficulties (Zanarini et al., 2007). The impulsivity and lack of coherence of BPD behaviors are usually not attuned to the situation, and they often aggravate the tension they attempted to release or solve.

In this regard, affectivity plays a fundamental role in regulating the tensions of the living, being manifested in organic, sensorimotor and intersubjective domains of embodiment. As introduced before, sense-making is fundamentally affective insofar as the world is not indifferent to the individual, but affectively valenced (Colombetti and Thompson, 2008). Affectivity, in this context, integrates local tendencies, forces and diverse normativities in a coherent and integrated organismic attitude (Wrbouschek and Slunecko, 2021). It thus anticipates certain coherence in the individual-world coupling by operating over preindividual potentialities (Keating, 2019). Affects predispose the individual to certain interactions, closing or opening the field of potential trajectories for individuation. For instance, depression does not only imply being stuck in a sad mood, but also a general diminishment of the field of potentialities for action or *affordances* (de Haan et al., 2013), a diminishment of the sense of self or affective depersonalization (Aho, 2013), and impaired bodily coordination and affective participation with others (Fuchs, 2013a,b). Depression implies an atmosphere of emotional indifference, which hampers meaning-making and diminishes the sense of self that accompanies meaningful experiences. In other words, it curtails self-individuation by decreasing potentialities in one's becoming. This decrease of future potentialities is directly captured by the concept of the preindividual proposed by Simondon.

Sense-making is participatory

Sense-making, in the case of humans, is always and from the beginning an intersubjective and social enterprise (De Jaegher and Froese, 2009). Our cognitive capacities, the categories we employ for meaning making, our perceptive habits and affective valences are deeply constituted by the social environment we are embedded in and our history of social interactions. As a consequence, every mental disorder has an inexorable intersubjective dimension, which has generally been downplayed in psychiatric accounts of mental disorders.

From the enactive perspective, several examples have been raised highlighting the intersubjective character of mental disorders. Indeed, a large proportion of our engagements with others imply a bodily coordination or attunement with others—both in terms of vital rhythms and affects (Fuchs, 2005, 2013b). Autism, for instance, can be better understood as a disorder of the pre-reflective embodied engagement with others in face-to-face encounters than as a dysfunction in the "theory of the mind" or mindreading module in the brain (Gallagher, 2004; De Jaegher, 2013). Anxiety disorders may also result from complex interactions and looping effects between individual behavior and interpersonal responses (Glas, 2020). Although some character traits, such as attachment styles, may have a clear causal role in the emergence of anxiety disorders, individual traits do not fully explain the dynamical trajectory that leads a person to fall into a certain pathological state. In this case, the atmosphere at work-places, support of family and friends, and relational styles may contribute to the emergence of a panic attack.

For Simondon, anxiety is the result of a turn inward, an attempt to solve an affective tension alone, without participating in the social realm. Anxiety is central to understanding the relationship between the preindividual and the transindividual, and the connection between psychic and collective individuation. Anxiety emerges with the impossibility of resolving the problem of affectivity, that is, the incompatibility between the constituted individual and his pre-individual load. The excess of pre-individual potentialities requires the collective to actualize itself. There is a difficulty to integrate diverse affects—psychic individuation—because there is a lack of connection with the external world—collective individuation. In anxiety "emotion becomes amplified and internalized; the subject continues to be and operate an ongoing modification within itself, but without acting, without being inserted into or participating in an individuation" (Simondon, 1958/2020, p. 284). As explained earlier, emotions and psychic life in general, for Simondon (and for the enactive approach), cannot be reduced to private states of the individual and demand participation in the collective. The anxious subject tries

to solve the affective problem looking only at itself, entering in a mode of solipsistic individuation doomed to fail. Anxiety is thus not only a consciousness of separation from the collective, but the impossibility of actualizing the potentialities within the individual. That is, an attempt of sense-making isolated from the intersubjective domain. In fact, anxiety and other symptoms show important differences among cultures (e.g., Kirmayer et al., 2011), which suggests that they can be influenced by implicit social learning.

To provide another example, schizophrenic delusions may emerge as feedback loops between biological, behavioral, and intersubjective factors (Fuchs, 2009; Van Duppen, 2017). Biological imbalances may contribute to social withdrawal that in turn leads to a misattunement with others, which feeds back onto the individual increasing their probability of undergoing a psychotic episode and delusions. Indeed, the embodied minimal self, which provides a coherent sense of self and is disturbed in delusional experience emerges from early social interactions and temporal attunements with others (Kyselo, 2014, 2016). Interpersonal interactions, thus, not only impose causal constraints to the emergence and persistence of mental disorders; they play a key constitutive role in their generation. In other words, we can say that the bearer of the pathology is not only the individual. Mental disorders are relational phenomena that stem from the dynamic interplay between individual and intersubjective interactions.

Accordingly, the enactive approach necessarily adopts a second-person perspective on psychotherapy (Galbusera and Fellin, 2014), where the therapeutic relationship is characterized as a social interaction based in resonance, engagement and mutual responsiveness. The therapist is no longer seen as a detached epistemic subject that approaches the patient as a passive object of knowledge. Instead the therapeutic process is seen as a dynamic process of participatory sense-making where both participants contribute to shared meanings and both are transformed by them (García, 2021). The transformative role of the therapeutic relationship is explained by this intersubjective character of humans, that is, the fact that our interpersonal engagements with others represent a form of co-individuation and co-constitution.

As a final remark, the entanglement between dimensions of embodiment, and the effect of interpersonal interaction in symptoms is particularly evident in placebo phenomena. Placebo effects are psychosocial interventions without direct physiological influence that have been shown to have positive therapeutic influences in a variety of conditions (e.g., Benedetti, 2020). One of the aspects that placebo research highlights is the impact of concrete social encounters in symptoms and health outcomes—for instance, between patient and practitioner (e.g., Kelley et al., 2009), or between parent and children (Czerniak et al., 2020). In line with enactive ideas, these social interactions have been interpreted as participatory sense-making processes (Arandia and Di Paolo, 2021). This can be illustrated by the open-label placebo experimental paradigm. In these settings, participants are given a placebo pill and are told that it is a placebo. Therefore, there is no deception and no uncertainty over whether there might be some kind of direct physiological influence at work. However, the interaction with the researcher or practitioner in these cases also includes some interventions that open possibilities for change, such as talking about "a novel mind-body treatment" (Carvalho et al., 2016, p. 2767), explaining scientific evidence that supports placebo effects (Kaptchuk et al., 2010) or emphasizing the importance of following the instructions to take the placebo pills as in usual treatments (Hoenemeyer et al., 2018). The performance of the practitioner has been shown to be relevant as well (e.g., Thompson et al., 2009), with variability in therapeutic outcomes among practitioners following the very same protocol (e.g., Kelley et al., 2009). In the same vein, the sociocultural context can also have deep influences on placebo phenomena (e.g., Kirmayer, 2011). Therefore, placebo phenomena reflect the transindividual proposed by Simondon—the deep entanglement between organic and intersubjective realms—while opening room for investigating their mutual influences in therapeutic practice.

Discussion

The enactive framework presented here depicts human beings as permanently and actively building their own identity in a self-individuation process. Humans need to develop and renew goals, skills, potentialities, and tensions in order to maintain the coherence of their socially situated bodies while remaining open to further transformative interactions with the environment. This approach highlights processual and relational aspects of mental disorders emphasizing transformation and adaptivity over the static view promoted by homeostasis and adaptation-based health models. This view also highlights path-dependence of mental disorders taking into account accumulated past individuations and experiences. Self-individuation involves a historical and non-linear process full of complexity that advances by combining sudden abrupt transformations with more subtle and gradual changes, often overlapping individuation processes at multiple scales. Adopting the perspective on individuation proposed by Simondon, the renewal of tensions within and across biological, sensorimotor and intersubjective dimensions are considered as constitutives of human life. Living processes entail a dynamical regulation of distributed and situated norms along different dimensions of embodiment. These regulations take the forms of local gradients and trajectories whose integration leads to progressively more complex organism-environment structural couplings. Interpersonal interactions, in turn, are seen as constitutive of mental disorders, being involved in looping effects that modulate their emergence, persistence and decay.

Within this context, the interpretation of symptoms and therapeutic interventions should be based on knowledge of the whole organism, including temporal and relational aspects. Symptoms are no longer understood as compensatory mechanisms of going back to an homeostatic and relatively stable state, but mechanisms that do play regulatory roles when the whole organization is taken into account (Merleau-Ponty, 1945/2012). This view suggests interpreting symptoms as consequences of a complex tensioned network involving multiple normativities that demand further changes and individuations. We consider psychological symptoms as calls for individuation, as excessive tension that needs to be partially released in a meaningful and transformative way. In this sense, certain symptoms can be seen as manifestations of the preindividual load of the organism, its potentialities for change and transformation that, for some reason, are partially blocked. Accordingly, symptomatic behavior entails sensorimotor patterns that do not help transforming tensions but just allow a partial release—which might have short-term benefits but do not contribute to opening potentialities for long-term improvements. Instead, these behavioral patterns may reinforce themselves, diminishing the preindividual field of potentialities and favoring the generation of excessive tension in the future (e.g., in addictions). Despite their obvious negative effects at the experiential level, some symptoms may be seen as having positive value to the patient insofar as they demand transformation and change (i.e., opening potentialities, enhancing the preindividual) and preventing decline into a more debilitating state of affairs. Hence, symptomatic behavior should be seen from an integrative perspective that uncovers their meaning for the whole organism. As the three dimensions of embodiment are deeply intermingled, tension in one domain may reflect a problem in another domain, or offer possibilities to be released through another domain. For instance, a typical apathy in depression is not a symptom merely at the individual level, but involves changes in the patterns of interpersonal relatedness (Fuchs, 2009). A similar interpretation might be applicable to addictions. Beyond the tension between organic and sensorimotor norms, habits (including "bad" habits and addictions) may have a meaning when we zoom out to the social domain as the social regulatory function of smoking explained above. In this case, a sensorimotor habit may contribute to release tension that originated in the intersubjective realm. Taking into account the entanglement among dimensions of embodiment and the role of tension may facilitate developing more integrative interventions.

The implications of adopting a relational and process perspective on pathological symptoms and mental disorders are manifold. The simondonian and enactive approach presented here invites us to look at the temporal aspects of mental disorders, that is, as developmental processes that constitute the individual. In this sense, mental disorders should not be seen as separated from the individuation process. They are processes that an individual enacts in his/her functioning. Accordingly, mental disorders are not only suffered, but they are enacted (Svenaeus, 2022). This perspective also allows us to focus on change rather than on stability, that is to stress the role of phase transitions between stages, relapses, recoveries and moments of different intensity. This perspective contrasts with the biomedical paradigm, which aims at identifying and treating dysfunctional mechanisms following reductive methods that are constrained to objectively measurable physiological processes. The entanglement between physiological, sensorimotor/psychological and social processes, and the relevance of the interactions among these realms also contrasts with the biopsychosocial model (BPS). In practice, BPS tends to treat the three fields as independent, often assigning more importance to the biological and downplaying the interactions between the three domains. The target of the enactive approach, instead, is the whole organism, coupled with its associated sociomaterial environment and immersed in an ongoing individuation process. That is, it encompasses the entangled organic, sensorimotor and intersubjective dimensions of embodiment in a dynamic and transformative interaction with the environment.

As one can notice, the enactive approach shares some principles with systemic perspectives to psychotherapy (Minuchin, 1974/2018; Hardham, 1996). Building on insights from early cybernetics (Bateson, 1972/2000), systemic psychotherapies advocate for understanding every act or event as being a sign of the whole interpersonal/organizational/family system the individual is embedded in Minuchin (1974/2018). Symptoms are emergent wholes rather than mere individual activity and thus are manifestations of interactive patterns of the entire system. The enactive approach we are presenting here takes a systemic perspective in the sense that it aims at preserving a holistic view on the individual, but it aims at offering tools and ideas to investigate the interconnectedness of interpersonal or social interactions with multilayered domains of activity such as the organic or the sensorimotor. In this way, we do not see the individual as the fundamental or ultimate atomic element that composes the system's network. Instead, the individual is seen as the attempt of gaining coherence between intertwined processes at multiple scales. We can assume, then, multiple and non-concentric levels of interiority/exteriority composing the individual. Accordingly, the enactive approach advocates for a pluralist perspective on treatment (Fuchs, 2009), acknowledging the efficacy of pharmacological interventions, body-oriented therapies, psychotherapy or socio-community interventions.

As a final remark, Simondon's philosophy suggests a processual and relational ontology that is in line with the enactive principles and proposes a technical corpus that allows us to develop and enrich enactive perspectives on mental disorders. At the same time, we did not exploit the vast philosophy of Simondon, which offers more concepts

(e.g., transduction) that can further complement the enactive framework and might be potentially useful in describing mental disorders. Some of the consequences that we derive from this theoretical dialogue are already present in other approaches. For instance, preventive medicine and allostatic perspectives on psychological processes have already made the claim that not only adaptation counts to health. The concept of adaptivity requires transformation in self-organization and/or transformation of the environment (Kirmayer et al., 2011; Menatti et al., 2022). In the same vein, phenomenological perspectives advocate looking at pathology as existential conditions of life processes that demand changes (Lindsey, 1996; Ratcliffe and Broome, 2012; Carel, 2013). The enactive approach presented here allows us to bring all of these claims and intuitions together into a unified conceptual and theoretical framework. Further research should be aimed at the operationalization of some concepts developed here in a rather loose manner (e.g., *tension*) and their application in the field of cognitive sciences and health research. This work is a preliminary step showing the potential applications of enactive concepts and ideas in mental disorders that hopefully will inspire future research.

Data availability statement

The original contributions presented in this study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

All authors contributed equally to the conceptual analysis, theoretical reflection, writing of the article and manuscript revision, and they read and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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Integrative systemic and family therapy for social anxiety disorder: Manual and practice in a pilot randomized controlled trial (SOPHO-CBT/ST)

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Social anxiety disorders (SAD) are among the most prevalent mental disorders (lifetime prevalence: 7–12%), with high impact on the life of an affected social system and its individual social system members. We developed a manualized disorder-specific integrative systemic and family therapy (ISFT) for SAD, and evaluated its feasibility in a pilot randomized controlled trial (RCT). The ISFT is inspired by Helm Stierlin's concept of related individuation developed during the early 1980s, which has since continued to be refined. It integrates solution-focused language, social network diagnostics, and genogram work, as well as resource- and problem orientation for both case conceptualization and therapy planning. Post-Milan symptom prescription to fluidize the presented symptoms is one of the core interventions in the ISFT. Theoretically, the IFST is grounded in radical constructivism and "Cybern-Ethics," multi-directional partiality, and a both/and attitude toward a disorder-specific vs. non-disorder-specific therapy approach. SAD is understood from the viewpoint of social systems theory, especially in adaptation to a socio-psycho-biological explanatory model of social anxiety. In a prospective multicenter, assessor-blind pilot RCT, we included 38 clients with SAD (ICD F40.1; Liebowitz Social Anxiety Scale, LSAS-SR>30): 18 patients participated in the ISFT, and 20 patients in Cognitive Behavioral Therapy (CBT; age: M=36years, SD=14). Within-group, simple-effect intention-to-treat analyses showed significant reduction in social anxiety (LSAS-SR; ISFT: d=1.67; CBT: d=1.04), while intention-to-treat mixed-design ANOVA demonstrated the advantage of ISFT (d=0.81). Per-protocol analyses supported these results. The remission rate based on blind diagnosticians' ratings was good to satisfactory (Structured Clinical Interview, SCID; 78% in ST, 45% in CBT, p=0.083); this has yet to be verified in a subsequent confirmatory RCT. The article will present the ISFT rationale and manual, including a special focus on multi-person settings, and the central findings from our pilot RCT.

KEYWORDS

integrative systemic and family therapy (ISFT), social anxiety, multi-person, manual, pilot, feasibility, randomized controlled trial, cognitive-behavioral therapy

Healing as a joint achievement

Collective psychotherapy cultures follow the principle of "healing as a joint achievement" (Schweitzer, 2014). They incorporate an understanding of psychotherapy that has been pushed back in individualized societies to the advantage of individual diagnosis and intervention ("single-person therapy"). Collective psychotherapy cultures, however, have the potential to make a significant difference in the *discourse of psychotherapy* when, in addition to "index clients" and therapists, therapy equally includes family members, friends, colleagues, neighbors, and co-workers, as well as supervisors ("multi-person therapy"). They all can contribute to the development, maintenance, and change of mental disorders and physical illnesses. Therapists who value and believe in the engagement of all these social system members, even if they completely contradict each other, embody core principals of systemic thinking: e.g., radical constructivism and "Cybern-Ethics" (von Förster and Ollrogge, 2008; McNamee and Hosking, 2012), multi-directional partiality and neutrality (Boszormenyi-Nagy and Sparks, 1973; Cecchin, 1987), and a both/and-attitude toward a disorder-specific vs. non-disorder-specific systemic therapy (Lieb, 2009). Characteristics of the *habitus* encompass acting, rehearsal, and playing, in contrast to simply sitting and listening. A flexible composition of the therapy setting is the *norm*, allowing single- to multi-person conversations as well as setting changes.

Therapeutic conversations can include one client or a couple, the family, colleagues, superiors and professionals from various institutions (e.g., the school, youth welfare office), social workers, and doctors. Psychotherapy as cultural practice takes place not only in sacred spaces such as the therapy room, but also in profane places such as the home, in schools, the office, or playgrounds. The location, frequency, duration, and number of therapy sessions vary greatly depending on the clients' concern and the context of the therapy. In our Heidelberg practice-research group, we developed an Integrative Systemic and Family Therapy (ISFT; Schweitzer et al., 2020). The ISFT includes the therapeutic stance, rationale of disorder and intervention as represented by collective psychotherapy cultures and applies it to social anxiety disorders. It was examined in a feasibility study and showed trends toward positive therapeutic change when compared to Cognitive Behavioral Therapy (CBT; Hunger et al., 2020; Hunger, 2021).

Therapeutic stance

Radical constructivism and Cybern-Ethics

The ISFT grounds in radical constructivism (Gadenne, 2008): cognizance emerges within a creative process of constructing various realties ("multiverse"; Tjersland, 1990). The existence of objective facts is not denied, but the epistemological relevance of the world's ontological representations is challenged (McNamee and Hosking, 2012). Radical constructivism, and with it the idea that every observation essentially depends on and is influenced by the person that makes the observation, builds the epistemological counterpart to second-order cybernetics (Maturana, 1987; Bateson, 2000). Contrarywise, first-order cybernetics is limited to the reciprocity of the different parts, i.e., members, of an affected social system (Selvini Palazzoli et al., 1977).

Every communication and interaction is subject to complexity-reducing observation processes ("perception-taking" [dt. "Wahr-Nehmung"]). On the one hand, our brain selects a few explanations from a wealth of possible explanations: we perceive something. An example: even though the consciously visible spectrum (light) is between 380 and 780 nm, we do not consciously perceive UV or infrared radiation due to our biological condition. Likewise, cultural, social, familial up to individual and (epi-)genetic imprints determine which information we select as significant. On the other hand, it is a matter of meaning-making in (un)conscious reciprocal reaction to what is perceived ("perception-giving" [dt. "Wahr-Gebung"]). Another example: Someone who reacts to a marriage proposal with the answer "yes" gives a social system, e.g. spouse to be, parents-in-law to be, own parents and friends of the couple, a fundamentally different information compared to someone who says "no." If we follow the reciprocity of "perception-taking" and "perception-giving," our base of possible beliefs in objective facts thus begins to dodder. Ethical points of view no longer ground on the suchness of the world. What remains is an increasing taking of responsibility on how we encounter and can influence the world around us ("Cybern-Ethics") (Table 1; von Förster and Ollrogge, 2008).

Multi-directional partiality (Neutrality)

In the ISFT, the core therapeutic stance embodies multi-directional partiality (neutrality), i.e., the unconditional respect of the (1) *meaningfulness of symptoms*, (2) *ambivalence to (not) change*, and (3) *autonomy* considering the question of who attaches importance to which therapeutic offers. Multi-personal perspectives lean on the phenomenon that social system members primarily follow their own meaning-making, which does not necessarily generate social realities compatible with other social system members. *Construct neutrality* addresses the co-existence of different explanatory models regarding the emergence, maintenance, and change of problems and solutions. The core question is about the purpose of preferring one reality over the other. Loss of construct neutrality is reflected in the unidirectional favoring of a specific explanatory model. At worse, this merely is

TABLE 1 Radical constructivism and Cybern-Ethics (von Förster and Ollrogge, 2008; Schweitzer et al., 2020; Hunger, 2021).

Process qualities	Therapeutic consequences
Perception-taking [dt. "Wahr-Nehmung"]	• When we form an opinion about a social system, it is helpful to think that we could always describe it differently. • We need to consider whether a description we favor is helpful or whether another description might allow more options for action. • Truth ("it is so") is replaced by the criterion of usefulness ("it is helpful to understand it that way").
Perception-giving [dt. "Wahr-Gebung"]	• When we picture a social system, the probability increases that it behaves accordingly. • When we have problems with a social system, we can ask ourselves about our impact on the creation of this "problematic system." • When we get involved with this thinking, it is harder not to take responsibility for how we interact with others: "A disorder is a shared construct!" (Borst, 2017).
Cybern-Ethics	• We are in charge of how we perceive and interact with the world around us: every day, it is our decision which reality we opt to live in! • We have to give reason whereto we see the world this or that way, and we have to take responsibility for the consequences of our actions!

the explanatory model of the therapists while neglecting the clients' point of view. *Relational neutrality* occurs when relationship offers are made equally to each social system member and no one is addressed more strongly compared to others, at best while conceding similar speaking times to each social system member. *Problem-solution-neutrality* grounds in the equal validation of change and no-change. It is considered lost, if one holds on to the imperative that the affected social system must change although it still needs time in the problem space, and vice versa. (Loss of) neutrality is not a static event, but a dynamic-interactive process that oscillates in time and requires reciprocal client(s)-therapist(s)-communication. The ISFT therefore uses brief supervisions where, e.g., clients are asked: "As family members, do you experience yourself as equally seen and valued by us therapists, or is there any favouritism?" (Cecchin, 1987; Schweitzer et al., 2020; Hunger, 2021).

(Non-)Disorder-orientation

In the development and piloting of the ISFT, we often discussed the need for how much, and whether at all, we needed a disorder-orientation. Lieb (2013) discusses four positions and argues for a both/and attitude, which we prefer for the ISFT as well. It includes the unification of the positive aspects of and discourse with experts from other therapeutic positions. We remain neutral toward the symptoms, not labeling them as good or bad, but primarily as meaning-making (Emlein, 2010). We understand disorders as the striving for the best solution at a particular time in the context of a significant transition (Schweitzer et al., 2020). According to Cybern-Ethics (Table 1), diagnoses are understood as a consequence of social negotiation and above all are subject to the question whether they are of use to the affected social system (*utilization principle*; Hammel, 2011). They embody attributions vs. intrasystemic or intraperson truths (Hacking, 1999, 2006). Diagnoses are the link to those who work with clinical codes (e.g., physicians, psychiatrists, psychotherapists, and health insurance companies). In the ISFT, they are used if clients call for them (e.g., "Now this 'something' has a name!"), and if they serve the social system (e.g. "The symptoms, i.e., this disorder, is my protective shield against overburdening!"). Nevertheless, the main focus of ISFT still is the exploration and testing of other ways of creating meaning (Schweitzer et al., 2020).

Conceptualization of social anxiety disorders

Symptomatology

Social anxiety disorders (SAD) are one of the most prevalent mental disorders (lifetime prevalence: 7–16%), with high impact to those who constitute a social system that includes SAD. The core symptom of SAD is the fear of rejection, ongoing for at least 6 months in one or more social interaction or performance situations while being confronted with unfamiliar people. The social situations are avoided or endured with intense fear or anxiety. SAD is associated with considerable psychosocial handicaps, and increased risk for comorbid disorders and suicidality (Ruscio et al., 2008). Remission rates are low (e.g., 20% in the first 2 years) compared with affective and other anxiety disorders (Yonkers et al., 2003).

Systemic explanatory model

In the context of the ISFT, we do not understand social anxiety as a mischief and troublemaker but to some degree as reasonable or even useful. It triggers *adaptive self-organization* (e.g., adolescents moving out of parental home; parents focusing on (re) available times), *use of innate behavioral programs* (e.g., endorphin release in times of crisis), and *adaptive modification as well as reorganization of neural networks* (e.g., learning from experience). Social anxiety appears as an existential experience and a component of everyday life (Hüther, 2008), including various aspects of inter- and intrapersonal functioning as depicted in the socio-psycho-biological explanatory model adapted to social anxiety (Luhmann, 2017; Hunger et al., 2018; Figure 1).

In terms of *interpersonal functioning*, we understand social anxiety as an indicator, i.e., the symptom, of unsatisfactory social interactions between at least two social system members often emerging from an unresolved developmental process that affects the whole social system. It may arise as a mismatch of, e.g., one's sense of belonging while on the other hand striving for the

exploration of the world, in need for individuation, or autonomy. Children or adolescents with SAD may thereby ask themselves and others: e.g., "How can I become independent without losing contact to my parents?" (related autonomy); "How do I want to face the world, and as who?" (self-image); and "What friendships do I want to maintain, and how do I want to encounter superiors compared to my parents?" (social contact). Parents can similarly ask themselves and others: e.g., "How can I become more autonomous (again), take advantage of (new) freedoms, and still stay in touch with my descendants?" (related autonomy); "What do I (still) want to experience in the world, and as who?" (self-image); and "What friendships do I want to (re)intensify, and what parts of my personal and/or professional life do I want to expand?" (social contacts). It is precisely these questions, among others, that therapy is concerned with, and which are addressed in the ISFT. The concept of Related Individuation (Stierlin, 1976) follows this idea. Relatedness, and belonging, describe the experience of being an acknowledged member of a social system. This is shown through being respected and welcomed, and of forming and maintaining significant relationships with others in the social system. Belonging is essential to protecting the boundaries of the social system. Individuation describes the standing up for one's own needs and implies the understanding that rights, responsibilities, appropriate indebtedness, closeness, and distance can be negotiated. Both relatedness and individuation can be understood as two sides of a coin which together are essential for the growth of individual social system members as well as the social system as a whole. A well-balanced Related Individuation allows for the establishment of a new social system, e.g., conjugal family, without having to abandon ties, e.g., regarding one's own family of origin. In SAD, symptoms serve the prevention of openly communicating desires of freedom which is associated with threatening the existence of the social system. Instead, they weld all social system members together. However, the desire for appropriate distance persists as seen in (non)verbal communication and interaction (e.g., relationship breakdown, aggression). The successful resolution of entangled social relations therefore requires a co-evolutionary process of the social system as a whole, in which all system members are significantly involved.

In terms of *intrapersonal functioning*, we see social anxiety as kind of intrapsychic gain, e.g., when it serves the prevention of negative emotions (e.g., fear and anger) and as pseudo-compensation for developmental deficits of the social system in the transition from a centripetal phase with narrow family ties (e.g., in times of a newborn) to a centrifugal phase with looser family ties (e.g., adolescents' moving out of home). Social system changes can be frightening when failure seems imminent and with it the threat of the social system's existence (e.g., breakup of the family of origin). Avoidance of anticipated negative consequences, however, reinforces the idea of existential threats, and thus

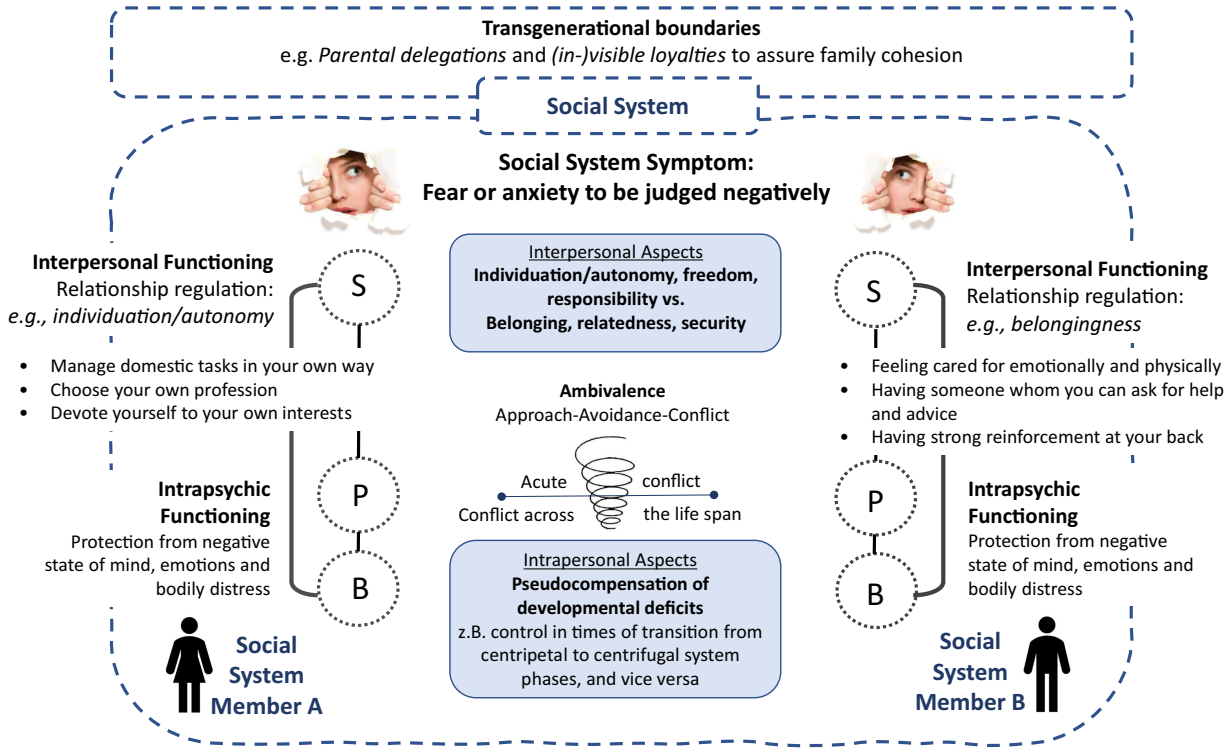

FIGURE 1
Socio-psycho-biological explanatory model adapted to social anxiety (Luhmann, 2017; Hunger et al., 2018; Schweitzer et al., 2020). S, Social system (verbal and non-verbal communication and interaction); P, Psychological system (thoughts, emotions); and B, Biological system (corporeal parameters).

reciprocally produces what is attempted to be avoided. Spill-over effects of negative communication and interaction patterns, emotions, and thoughts, finally cause a sometimes very pronounced socio-psycho-biological impairment of the various social system members (Priest, 2009).

Transgenerationally, significant social system patterns have an impact on the inter- and intrapersonal perception of the social anxiety. Social restraint, e.g., a "keeping one's head down," may have been essential for survival in wartime. Parental delegations, e.g., a "make it the same like me as your father/mother" may serve as *(in-)visible loyalties* (Boszormenyi-Nagy and Sparks, 1973; Stierlin, 1976), fostering family cohesion. Every detail of a family biography becomes part of a multi-layered pattern that co-determines the identity of the social system members in the here-now. The past becomes the prologue (Petry and McGoldrick, 2013). However, once the war and/or delegation is over and one steps out of the group, social anxiety prevents the successful mastering of the developmental challenge. It emerges as a maladaptive and repetitive prophylactic power play that unravels along the question of who defines the relationship and how (Selvini Palazzoli et al., 1977; Hand, 2002). This may be the clients with SAD motivating their partners to protect them, who finally take over all activities, above all those outside the home. This can also be the partners who put a stop to the clients' less trusting behavior, e.g., by interrupting the excessive preparation of a speech and inviting the client as a partner to go for a walk. *Sense-making* becomes the central phenomenon. In terms of meaning-making, one person has to communicate, and another person has to perceive what is communicated as meaningful (e.g., by understanding the utterance, "Please accompany me to psychotherapy!"). The person has to connect (e.g., by agreement or disagreement: "I would never let you leave alone at home!," or "I think you can manage quite well without me!"; Emlein, 2010). If this sense of reference (*focus*) is missed, disorder-specific symptoms can become the organizing principle of the social systems' inter- and intrapersonal relations (Luhmann, 2017).

Treatment of social anxiety

A detailed description of the ISFT can be found in the ISFT manual (Schweitzer et al., 2020). For this paper, we choose those aspects which we experience to be central components of the ISFT but less known in their disorder-specific choreography in the systemic community.

Manual structure and flexibility

In the ISFT we distinguish four therapy phases with approximately 25 therapy hours, including different objectives with mandatory as well as optional interventions (Table 2, for an overview of the composition of interventions; Table 3, for an overview of the therapy structure). The practice of the ISFT allows for a certain degree of flexibility which seems essential to us when speaking of a client-centered therapy process orientation. The initial phase ideally comprises four sessions with five therapy hours, but in the case of more multi-person conversations it, however, can be fruitful to extend this phase and use therapy hours from other therapy phases such as the mid-phase which, in turn, will then be carried out in a more streamlined way. The same applies when, e.g., the initial phase appears to be finished after three therapy hours, so that the mid-phase begins in the fourth therapy hour. Ideally, the ISFT should be completed in about 22 therapy hours, with three sessions for consolidation after about 6-, 9-, and 12-month post starting the ISFT.

Multi-person conversations and outreach interventions in the social reality of the client's daily life can be used as single sessions of 50 min or double sessions of 100 min. The choral speaking is conducted as a group session of 150 min. Other variations are conceivable: e.g., therapy hours can be subdivided and complete a week with a debriefing of 25 min after an outreach intervention of 125 min a few days ago; e.g., several sessions of 25 min each can serve a kind of "therapy break" after therapy goals have been (partly) achieved, and for the stabilization of significant changes.

From our point of view, each manual is an ideal suggestion from which there are good reasons to deviate from in individual cases. It seems optimal to us to *take the ISFT manual sufficiently seriously, but not too seriously*. This is the reason why we use bullet points instead of numbering in the description of mandatory and optional interventions (Table 2). All interventions are interchangeable in their order. Even therapy planning in phase 1 can be started in the first therapy hour. In particular, it is important to define with the clients which duration and intensity, for both the single therapy session as well as the intervention, seems most useful under which circumstances.

Multi-person conversation

The aim of multi-person conversations in the ISFT is to get a shared idea of who is involved in the development, maintenance, and change of the presented problems and symptoms, and who can participate in the therapy process. It is about exploring who has the power to offer optimal *support* as well as to *worsening* the situation. Especially in the initial phase, it seems favorable that the social system members are bound to a secure and safety therapeutic atmosphere that may empower them to give each other their "blessing" in trying out changes. Changes may address distancing movements (e.g., leaving parental home; acceptance of full-time jobs by both parents) as well as approach movements (e.g., trustfulness in family cohesion while announcing a job engagement; becoming an artist, that was not part of the family history yet, e.g., in a family of engineers). The social system members can often better support the interventions when they feel to be integrated, and the change process starts to be more self-sustained. It also becomes clearer who is burdened and how: this is of special interest above all in cases when so-called "index client(s)" appear(s) to be the last stable unit of an

TABLE 2 Objectives depending on the therapy phase, with mandatory as well as optional interventions (Schweitzer et al., 2020).

Phase	*Initial phase*	*Mid-phase*	*Final phase*	*Refreshment*
Objective	**Development of therapeutic relationship, understanding of the social system and the case, and therapy planning**	**Interventions and integrations**	**Balancing and prolapse prevention**	**Consolidation**
Content	Joining; systems diagnostics; construction of goals and contract; and therapy planning	Experimentation with possible changes	Congratulations; dealing with possible prolapses; and ending of therapy	Congratulations; dealing with possible prolapses; and stabilization of successes
Interventions, mandatory	• Getting to know each other, building confidence • Goals and motivation • Who is Who: genogram work and social network interview • Contextualization, and subjective theories of the social anxiety • Journey through time: past, present, and future with respect to the social anxiety (timeline) • Shared case construction: good reasons for living with more or less social anxiety • Treatment planning: "Who do I/we want to meet and when in therapy, and what do I/we want to do in the here-now as well as in the future?"	• Clarify if/why time for change is ready right now, or not yet • If no: reframing and symptom prescription • If yes: seek out attractive situations and contexts associated with the social anxiety; with therapist, therapy partner, or alone; virtual or real encounter with these events • Group session: choral speaking to deconstruct belief systems associated with the social anxiety	• Balancing • Congratulation, including a person-centred certificate symbolizing therapy success • Coping with a life "after social anxiety" as well as after "therapy" as social support system • Dealing with future invitations to communication and interaction patterns, thoughts, and feelings associated with social anxiety • Farewell to a "life without therapy"	• Balancing • Congratulations, including the making of distinctions in case of prolapses • Evaluation of goal attainment in the here-now • Support of successful action in a life "after the social anxiety and without therapist"
Interventions in all phases, optional	• Observation tasks: When, where, and with whom (no) social anxiety comes and goes? • Scaling the intensity of the social anxiety, motivation to change, relationship quality, and social system functioning • Solution and aggravation questions • Pointing out the smallest signs of change • Recognition and positive evaluation of change as well as non-change • Adjustments to therapy goal planning in interim evaluations • Interventions from all treatment phases can also be used in other therapy phases			

affected social system. They can still have the power to call a psychotherapist in contrast to other social system members who have not the power to care for themselves anymore. We call such phenomena a "claim of psychotherapy on behalf of others." Multi-person conversations allow those who are protected and not apparently at the center of the psychotherapeutic action to be involved in psychotherapy anyway. Hence, the first step is to explore who should be invited (Table 4). In the IFST, we use social network diagnostics (Hunger et al., 2019; Braus et al., 2022) and genogram work (Petry and McGoldrick, 2013) to better understand the composition of affected social systems and their current as well as transgenerational social relationships.

Reflecting team

In order to give transparency to therapeutic processes and empower clients as autonomous entities, *reflective teams* can be installed in each ISFT session. The epistemological background refers to radical constructivism and the assumption that there are as many truth(s) as persons participating in the therapy, including therapists (Andersen, 1991). The forming of a meaningful difference then requires questions that have not been addressed by the clients nor the therapists. Reflecting teams strive to consider *what* constitutes the clients' (dys)functional communication and interaction in the sense of first-order cybernetics, and to provide a positive connotation of *how* to communicate and interact with each other in the sense of second-order cybernetics.

In tradition to the Milan approach (Selvini Palazzoli et al., 1975), we install reflecting teams directly in the therapy room. As a subsystem observing the therapy process, the position of the reflecting team is characterized by distance while being turned towards the clients and therapists at the same time (Figure 2). The reflecting team listens attentively and formulates questions, first inwardly and later verbalized, on how the symptomatology can be explained alternatively. After a certain period of time, and in consultation with the clients, the therapist asks the reflecting team for its perceptions,

TABLE 3 Course of ISFT in social anxiety disorders, ideal type (Schweitzer et al., 2020) The number of multi-person conversations is perceived as the minimum of sessions where significant social system members are involved. It is welcomed to increase multi-person conversations up to a complete multi-person therapy.

Phase 1: Initial phase for orientation and therapy planning (approx. 2 months)

Session 1: Joining and construction of goals and contract (1 h)

- *Joining:* welcome, orientation in the therapy room, introduction of therapist(s) and client(s), above all beyond problems and symptoms
- *Prompt (problem exploration):* "What problems and symptoms are (not) described? What is their history? In which social systems and contexts do they (not) occur?"
- *Concern (solution exploration):* "Assuming that the problems and symptoms have resolved one day, how do you (not) live and love? With whom and where (not)?"
- *Subjective theory:* "How do you explain the problems and symptoms, as well as the solution? Which consequences of action enable or hinder these explanations?"
- *Contract:* "What does a specific, positive, self-achievable, innovative and attractive solution looks like, that accounts for your living environment?"

Session 2: Genogram and/or social network interview (1 h)

- *Understanding the problems and solutions:* "For which problems do the symptoms appear to represent an attempt at a solution? What sense do they make? Where do they seem to (not) be useful?"
- *Resources:* "What family and social strengths are evident at the collective as well as the individual level?"

Session 3: Multi-person conversation (2 h)

- *Co-burden and co-treatment:* "To what extent do you, as a multi-person system, experience psychosocial burden? Which prompts, concerns and contracts for co-treatment do you address?"
- *Support:* "To what extent do you experience yourselves as supportive? What do you want to contribute?"
- *Patterns of interaction:* "Which (not) successful patterns of previous (not) successful solution attempts can you report?"

Session 4: Shared case construction and therapy planning (1 h)

- *Case construction:* "How does the therapy system, i.e., client(s), therapist(s), and significant other(s), describe problematic inter- and intrapersonal interaction patterns that provoke and maintain the symptoms ("attempts to solutions that have become problems"), their evaluation ("good reasons for staying with more or less of these symptoms"), and their solutions ("attractions to live life in an appropriate living environment")?"
- *Therapy goal planning:* selection and prioritization of desired changes along the question of "Who do we/I want to meet and when during the therapy, and what do we/I want to do with and without whom and when?"

Phase 2: Mid-phase for intervention and integration (approx. 6 months)

Session 5: Planning of the 1st outreach intervention in an approximately mid-level problematic private or professional environment (1 h)

- *Acteurs:* client(s), e.g. with peers, colleagues
- *Conditions to change:* "To what extent is time for change (not) ripe?"
- *If not:* appreciation of the good reasons for not changing yet; possible interventions: reframing and symptom prescription
- *If yes:* planning of a concrete outreach intervention in the sense of an attractive and problem-associated situation; (not) accompanied by therapist(s) and/or significant other(s)

Session 6: Experimentation in client(s)' daily private or professional environment (2 h)

- *Implementation:* "To what extent does the intervention (not) succeed as planned in session 5? Who is (not) involved? Which communication and interaction patterns can (not) be consciously controlled? Who does (not) attend the intervention?"

Session 7: Multi-person conversation for planning the second outreach intervention in a mid- to high-level problematic private or professional environment (2 h)

- *Acteurs:* client(s), e.g. with peers, colleagues
- *Conditions to change; if (not) ready to change:* see session 5
- *Implementation:* see session 6

Session 8: Evaluation of 1st and 2nd outreach intervention; planning of 3rd outreach intervention (1 h)

- *Acteurs:* client(s), with anyone who is of importance, including e.g. strangers
- *Conditions to change; if (not) ready to change:* see session 5

Session 9: Experimentation in the client(s)' daily private or professional environment (2 h)

- *Implementation:* see session 6

Session 10: Choral speaking and group conversation (3 h)

- *Showing up and learning from other clients:* "How do clients experience themselves and others while exchanging coping experiences and interaction with others who report similar symptoms, in the presence of their therapist(s) and supervisor(s)?"
- *Choral speaking:* Deconstruction of problem- and symptom-promoting beliefs within a group setting through the singing of the client(s)' belief systems by the group, and where newly created sentences are converted into new choral parts, until the clients begin to show altered reactions

(Continued)

TABLE 3 (Continued)

Session 11: Evaluation of 1st to 3rd outreach intervention, including the choral speaking session, planning of further (outreach) interventions, if necessary (1 h)

Phase 3: Final phase for balancing and prolapse prevention (approx. 4 months)

Session12: Balancing of progress and looking ahead to a life without therapy (1 h)

- *If therapy progress has been achieved:* congratulations, e.g., "certificate presentation" whereupon the client(s) report about their achievements, including a "recipe" for stabilization ("success work"); planning of further interventions, if necessary
- *If therapy progress has been little to not achieved:* appreciation of the good reasons for not changing yet; possible interventions: reframing and symptom prescription; planning how to live with the problems and symptoms ("arrangement counselling")

Session 13: Multi-person conversation (2 h)

- see session 12, in shared conversation with all important social system members

Session 14: Balancing and stabilization experiments (1 h)

- *If therapy progress has been achieved:* "How can therapy progress (not) be stabilized? Who or what can (not) cause it to dodder? Which new conflicts (not) show up? How can future invitations to "honorary rounds in the old pattern" (not) be dealt with successful?"
- *If therapy progress has been little to not achieved:* see session 12

Session 15: Balancing and farewell (1 h)

- *Farewell to a "life without therapy":* e.g. giving of stabilization symbols, farewell rituals, final awarding of the "certificate" closing an interview process that has started in about session 12

Phase 4: Refreshment and consolidation (approx. 3 months)

Session 16: Consolidation (1 h), multi-person conversation can, but do not have to, be practiced

- *If therapy progress has been achieved and/or stabilized:* "How can therapy progress (not) be consolidated? Who or what can (not) cause it to dodder? Which new conflicts (not) show up? How can future invitations to 'honorary rounds in the old pattern' (not) be dealt with successful?"
- *If therapy progress has been little to not achieved and/or stabilized:* see session 12

Session 17: Consolidation (1 h), multi-person conversation can, but do not have to, be practiced

- *If therapy progress has been achieved and/or stabilized:* "How can therapy progress (not) be consolidated? Who or what can (not) cause it to dodder? Which new conflicts (not) show up? How can future invitations to 'honorary rounds in the old pattern' (not) be dealt with successful?"
- *If therapy progress has been little to not achieved and/or stabilized:* see session 12

Session 18: Consolidation (1 h), multi-person conversation can, but do not have to, be practiced

- *If therapy progress has been achieved and/or stabilized:* "How can therapy progress (not) be consolidated? Who or what can (not) cause it to dodder? Which new conflicts (not) show up? How can future invitations to 'honorary rounds in the old pattern' (not) be dealt with successful?"
- *If therapy progress has been little to not achieved and/or stabilized:* see session 12

Therapy time: 1 h amounts to 50 min. Social system members: they can be part of private social systems (e.g., family, partner, (best)friends and/or professional social systems like e.g., colleagues, superiors).

TABLE 4 Inviting social system members into therapy (Schweitzer et al., 2020).

Criteria for identifying significant social system members
1. Client(s) and significant other(s) who suffer from social anxiety in a friendly and empathic way (e.g., parents, partners, friends, colleagues, and superiors)
2. Client(s) and significant other(s) who (un)consciously co-chronify the social anxiety by protection and caring (e.g., "I'll do it for you if you are too anxious").
3. Client(s) and significant other(s) with whom the client(s) have "unfinished business" (e.g., often, but not always: parents whose delegation was not taken by their children, or children who have not get what they perceive to have deserved from their parents)
4. Client(s) and significant other(s) who are important for stabilizing already achieved steps of change (e.g., innovative social relationships stimulated by "social drifts" from, e.g., anxiety to support social networks)

including ideas and questions to what they have perceived so far. The reflecting team members talk to each other but neither to the clients nor the therapist. They talk about their perceptions ("I perceive...!"), not about truths. Likewise, they ask themselves questions that they assume to contribute to a meaningful difference in the clients' communication and interaction patterns ("...and I wonder...?"). Subsequently, the therapist binds back to the clients and, in turn, asks for their ideas and questions in response to what they have perceived on the part of the reflecting team. The clients are thus invited *to co-create a conversation about the reflecting team's conversation about the therapy system's conversation*. A self-referential and self-organizing dialogue (autopoiesis) emerges about *what* serves to control the clients' self- and social system-preservation (first-order cybernetics) and *how* this control can undergo change (second-order cybernetics). The polyphony as perceived by the clients as well as therapists, and the reflecting team's example that this polyphony can be heard and benevolently negotiated, is considered a central mechanism of change in systemic therapy (Andersen, 1991).

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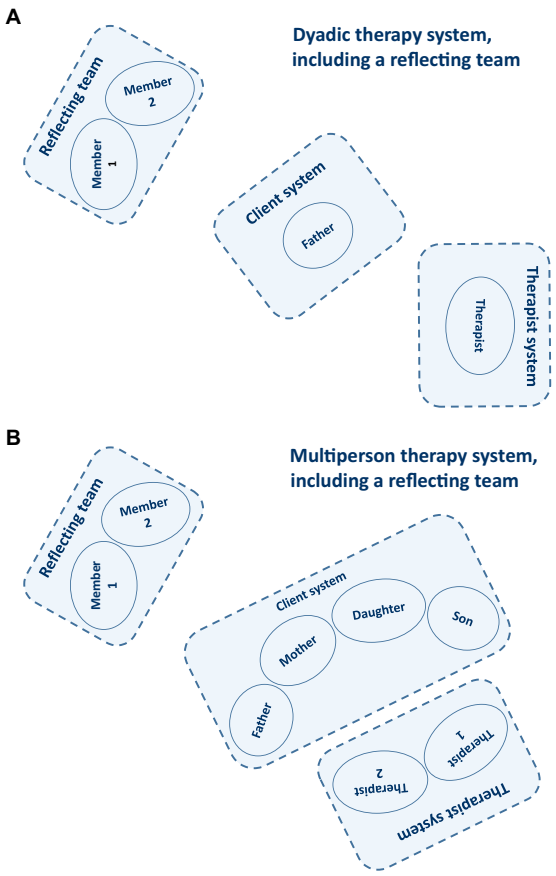

FIGURE 2
Therapy systems: **(A)** Dyadic therapy system, including a reflecting team; **(B)** Multi-person therapy system, including a reflecting team (Hunger, 2021).

Initial phase: Joining, social networks and case construction

We perceive clients especially at the beginning of therapy, and despite their apparent problem orientation, not at the low point of their crisis. If that were the case, they would not pick up the phone to call a complete stranger but rather try to avoid any contact with people unknown to them! Clients who enter psychotherapy have usually gone through a longer decision-making process and have certain ideas of what they hope to achieve, often with less informed expectations of what awaits them (Prior, 2010).

Initial phone contact and initial face-to-face conversation

We try to meet as early as possible with the clients' motivation, their pronounced suggestibility, and openness for new information as well as influences. The *initial phone contact* (approx. 20 min) serves as a first encounter between clients and therapists, and the radical constructivist and solution-oriented stance of the IFST. The first aim is to form an idea considering the symptom context. We ask the clients for a heading for their concern: e.g., "Finish the son's apprenticeship—even if it costs our family life!" The clients are invited to sketch their therapy goal which we support with respect to a positive goal formulation: e.g., "You would be happy to see your son with a professional degree that fits well to his competencies and inner wishes, and that you both stay alive in this family process?" When therapists experience the clients' concern as appropriate in terms of the proposed therapy, and clients agree to this, an appointment is made. The second part of this initial phone call serves the enculturation into the initial face-to-face conversation along three main topics. We ask clients if they would like to know about our interests in the first therapy session, and this question is almost always answered with a "Yes, I'd love to." (1) We reaffirm our interest in possible solution scenarios, introducing the miracle question: "The first thing I, as a therapist, will be particularly interested in is your goals. It is important to me that we, together, develop a clear picture of where you want to be at the end of our shared time. If we assume it goes optimally and you finally say goodbye with the words 'I am now where I wanted to be!', I would be interested in: 'Where are you then? How will you feel about yourself and others? What will you do differently?' I'll bring a lot of questions like this to our initial face-to-face conversation because I want to make sure we are pulling in the same direction." (2) We also are interested in problem-solving strategies tried so far: "I'll ask you in our first face-to-face conversation: 'What have you already tried to approach your goal?". There will certainly be some action that has made the problem smaller, and some action that has tended to make it worse. I'm interested in both: the successful, because perhaps we can do that more, and the unsuccessful, because this can save us from going in a wrong direction. Does that make sense to you?" (3) We finally point to the recognition of possible changes from now on till the first face-to-face encounter: "I finally will be interested in the good things that may have happened between our contact today till we meet face-to-face. Research has shown that over 70% of the clients who book a therapy appointment experience an improvement between these two events. This can be a small improvement as well as a very significant one—all the way to the rare case where therapy is no longer needed at all. So, I would ask you to simply pay attention to possible changes." The clients receive these questions together with the appointment confirmation by post. If multiple members of an affected social system are involved, the initial phone contact is conducted with each system member (Prior, 2010). The *initial face-to-face conversation* follows the choreography of the initial phone contact.

Social network diagnostics and genogram

Another meaningful part of the initial phase is to gain a better understanding of the structure and characteristics of the affected social system. We use genogram interviews (Petry and McGoldrick, 2013) to facilitate a pronounced transgenerational

TABLE 5 Genogram interview in the context of social anxiety (Schweitzer et al., 2020).

Process of a genogram interview
1. **Data collection** • "Who-is-Who in the family?" • We ask for parents, siblings, (former) partners, children, grandparents, and other important relatives. We also pay special attention to excluded persons such as children that are not born or given up for adoption.
2. **Reflecting team I** • "Are the social system members named comprehensively, or are significant others missing – and if so, which ones? Is the number of social system members mentioned appropriate, or too large – and if so, which persons, or group of persons, respectively, seems most interesting for the start of the genogram work?" • We use the reflecting team in the initial phase as early as possible in the intervention process to give it the chance to hypothesize as unimpressed as possible by what the client(s) otherwise may have already told us in a later stage of the intervention process.
3. **Offerings for identification and demarcation** • "Were there (social) anxiety, or other mental health problems, in your family? With whom and in which contexts?, How was this dealt with?, How has that affected you?"
4. **Trigger constellations** • "When did the social anxiety appear for the first time?, How was your family structure at that time: who was close by, who was far away?, Who noticed you, and who not?, Did anything special change in your family or way of life at that time?" • We also ask for social system stress, e.g., family dysfunction, illness, poverty, migration.
5. **Reflecting team II** • "What are the family members trying to prevent, or enable?, What would have to happen to make some of the family members more present (motivation to a place more in the foreground) or hidden (motivation to a place more in the background)?, How do they respond to each other, and what may introduce a significant difference in how they respond to each other?" • We use the reflecting team in the mid-phase of the intervention process to give it the chance to hypothesize as unimpressed as possible by what the client(s) otherwise may have already told us in a later stage of the intervention process.
6. **Interaction cycles** • "Who responded to the fears and how?, How did you, and others, responded to these reactions?, What was tried to alleviate the fears, and by whom?" (problem solving within 1st-order cybernetics)
7. **Upcoming development tasks** • "What family stories deal with loss, separation, insecurity?, Who has (failed to) provide security?, Who would tell these stories in which version?, What is next to experience?" • We also ask about social system stress, if necessary.
8. **Future meets presence** • "Suppose things are going well, you wake up one day and the symptoms are gone: how are your family relationships, and what has changed?, What is a first step from this solution scenario, looking at the problematic present, to successfully attain this future present?"
9. **Motivation to change** • "What (un)wanted family changes stimulate reduction in social anxiety?, What would get better, worse, or stay the same?, Who gives you power to change, and who withdraws that power?"
10. **Reflecting team III** • *Coherence*: "How coherent does the intervention process and the (solution) picture of the genogram appear?" • *Forgotten family members and/or relationships*: "What was possibly mentioned at an earlier point in time, however, then no longer addressed, but seems to be important?" • We use the reflecting team in the final phase of the intervention process to give it the chance to hypothesize as conclusive as possible by what the client(s) otherwise may have missed in their conversation process.
11. **Termination** • Final reconnection from the reflecting team to clients; resume of the intervention process and take-home-messages by clients and therapists; ending of the therapy session.

system perspective of the social anxiety. Genogram work according to the ISFT includes the identification and demarcation of social anxiety in the family and its history, social trigger constellations for social anxiety and social interaction cycles for its alteration, upcoming developmental task not approached by the family but indicated by the social anxiety, solution scenarios and the motivation to change. Reflecting teams can be used at any time to broaden the perspective of clients and therapists (Table 5).

Genograms, however, are limited to biological and legal relationships. They do not well include significant others, e.g., friends, neighbors, colleagues, and co-workers. We thus developed the Social Network Diagnostics (Hunger et al., 2019) to better understand the structure of the affected social system including all important social system members, while keeping in mind that an appropriate number (quantity) and prosociality (quality) of social relations characterize

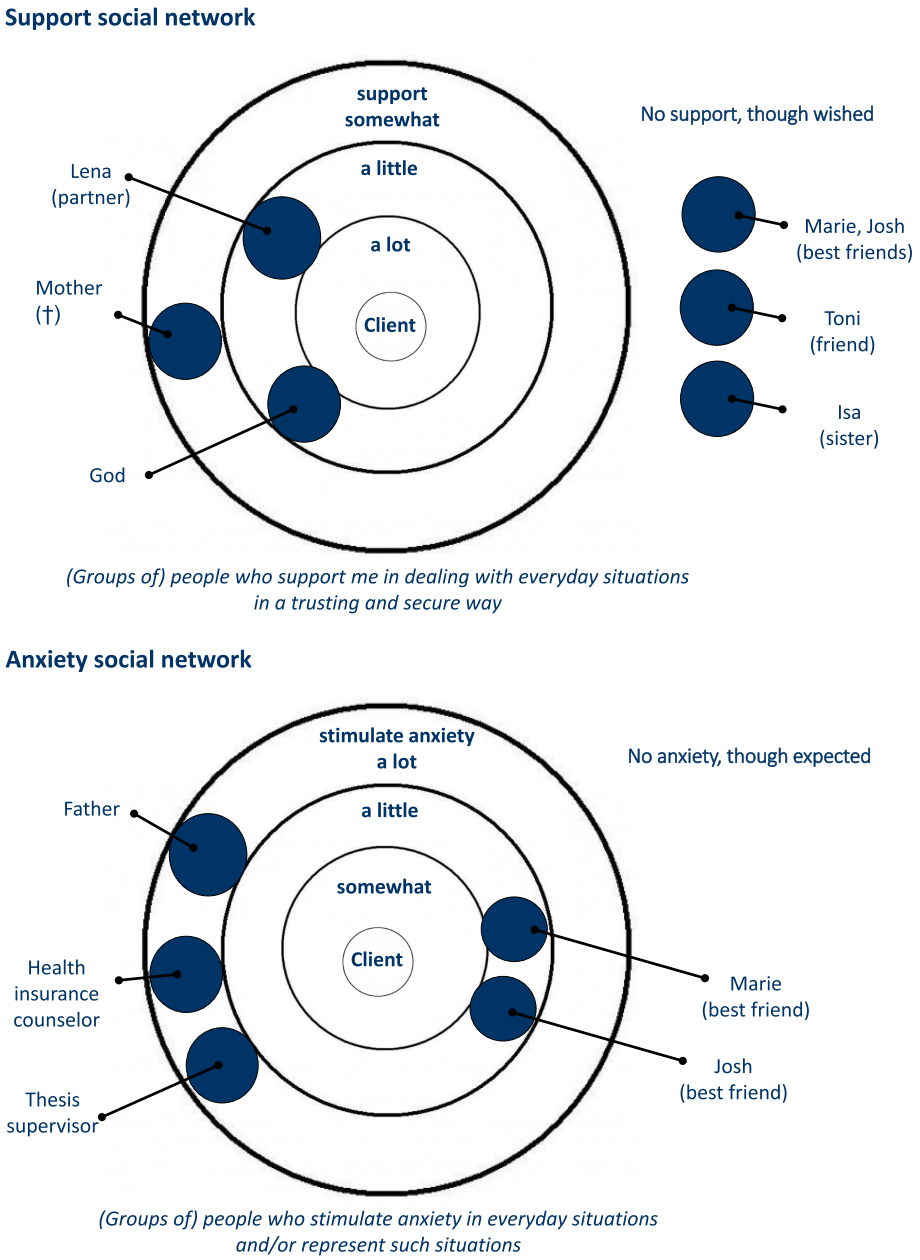

FIGURE 3
Support and anxiety social network (Schweitzer et al., 2020; Hunger, 2021).

well-integrated social networks (Eaker et al., 2007). The Social Network Diagnostics uses a semi-structured interview to assess the social system's structure based on three concentrically arranged circles. We distinguish between resource-specific and disorder-specific social networks (Figure 3). The affected social system (e.g., "I" or "my family") is positioned at the center of the circle structure. Resource-specific social networks, e.g., support social networks, ask for (groups of) persons who provide support for dealing with everyday situations in a trusting and secure way. The client(s) place wooden stones in the first, second or third circle representing the (groups of) persons who support him/her/them a lot/not so much, but also a little/somewhat. (Groups of) persons who do not give support at all, although wished by the client(s), find a place around the circles. Structural aspects such as the network size, demography, kind and duration of the relationship, and frequency of contact as well as functional aspects, such as positive social support, social negativity, and system experience are asked about for all (groups of) persons (Table 6). The same procedure is used in disorder-specific

TABLE 6 Structural and functional aspects of social networks (Hunger et al., 2019).

Categories		Examples
Structural aspects	**Size**	"Who belongs and who does not?"
	Demography	"How old is [person]?," "What gender is [person]?"
	Kind of relationship	"What is your relationship with [person]?"
	Duration of relationship	"How long have you known [person]?"
	Frequency of contact	"How often do you see and/or talk to [person]?"
Functional aspects	**Positive social support**	"How much do you experience that [person] cares about you?"
		"How reliable can you turn to [person] when you have a problem?"
		"How strong do you feel that [person] supports you?"
		"How much do you feel understood by [person]?"
		"How intense does [person] motivate you to tackle things concretely?"
	Social negativity	"How much do you feel criticized by [person]?"
		"How strongly does [person] get on your nerves?"
		"How often do you argue with [person]?"
		"How much do you feel overwhelmed by [person]?"
		"How intense does [person] prevent you from doing things concretely?"
	System experience	"How much do you experience that you and [person] belong to each other?"
		"How reliable do you experience that you can be in touch with [person] about your needs?"
		"How much do you experience yourself in harmony with [person], meaning that you are good at staying in touch even when things do not go harmoniously?"

networks, performing an inverted arrangement of the concentric circles, e.g., anxiety social networks (Figure 3).

Shared case construction and therapy planning

The initial phase ends with a *circular focus formulation* which is at the heart of systemic therapy. The circular focus formulation grounds in as precise a description as possible of how the social anxiety is linked with the disturbed communication and interaction patterns. It should well explain the emergence, maintenance and possibilities for change with respect to the social anxiety within the affected social system. The aim is to provide an approach how to alter the symptomatology while stabilizing previously identified resource-oriented relationships and modify problem-oriented communication and interaction patterns.

An example may serve as an illustration: A client experiences how the refrigerator is getting emptier, and he suspects that he will soon have to go shopping. He asks his partner to do the shopping. The partner reacts annoyed. The client's body posture becomes more tense with each refusal. The partner shows increasing distance with each new request. Finally, it comes to a dispute, and the partner strongly annoyed leaves the room while the client strongly annoyed stays at home. The opportunity for a joint solution seems to have been missed. According to Rotthaus (2015), the following questions now can guide the process of working out a circular focus formulation:

1. "What is the function of the social anxiety with respect to (the prevention of) the further development of the affected social system? What message does it send to which system member?"
2. "What role do (invisible) loyalties play? Which family, individual and context-related communication and interaction patterns (e.g., attachment (in)security, devaluation, and exclusion) are part of the background of the social anxiety?"
3. "How have similar challenges been (not) successfully dealt with?"
4. "Assuming that the social anxiety has become redundant: how will the client(s) live, love, and work?"

Reframings serve the positive reinterpretation within the shared case construction. They enable reversals into the opposite, as well as role reversals when therapists occupy the position of the "sceptics," valuing symptoms, and questioning change. Complementarily, they allow clients to take a more active position as "convincers that the solution is possible." In a variation of Schwing and Fryszer (2006), the formulation of a good reframing follows a narrow sequence of five steps:

1. "What is it exactly that is disturbing you? Please, describe the socially anxious behavior and experience specifically."
2. "In what contexts does socially anxious behavior and experience fit well, i.e., appears appropriate? In what situations was, and still is it, meaningful?"
3. "What skills become evident in the context of the social anxiety? What have/can you learn from it?"
4. "What good intention do you attribute to the social anxiety? What do you, and others, (un)consciously want to achieve (with the social anxiety)?"

TABLE 7 Modes of systemic questioning (Hunger, 2021).

Modes	Examples
Solution questions, wonder questions *Goal actualization*	"Suppose you solve the problem, e.g., the (social) anxiety, who notices it first? What is noticed? What are special features of the situation without the (social) anxiety?"
Contextualizations *Liquefaction of traits into behaviors*	"How do you manage moments with and without (social) anxiety? How do significant others manage such situations? How do others manage to show themselves straight and/or in need for help? Do they all and always show themselves like this, or is it in certain contexts and at certain times?"
Operationalizations *Explanatory models*	"How does each social system member explain other's thinking, feeling, and behavior?"
Aggravations *Problem intensification*	"What makes a good contribution to a faster and/or stronger escalation of the situation?"
Optionalizations *Alternative constructions of reality*	"Suppose someone decides to resist the invitations of others, and to stop presenting him- or herself as a conspicuous person, e.g., with (social) anxiety: How will this change challenge the established relationships? Who welcomes this change? What is missed? For whom does this change seem less acceptable?"
Historical questions *History of the symptomatology*	"When do the individual social system members think they first noticed the client(s) symptomatic behavior? Why not sooner, or later in time? When do others think that a certain person within the social system feels out of sorts?"
Scaling	"How do the client(s) rate the possibility to live a life without (social) anxiety? How real do the affected social system members rate the possibility of the intervention process failing?"

5. "What alternative behavior and experience appear in the context of meaning-making and maintaining the good intentions of the social anxiety, thus taking advantage of it? How can you design the solution in a way that it still contains the positive elements of the problem?"

A circular focus formulation, including a reframing, can explain the function of the social anxiety in the above described couple: The social anxiety of one partner keeps hold of the social system by involving the other partner's responsibility. The less one partner goes into contact with the outside world, the more the other partner takes over. Transgenerational (invisible) loyalties may operate in the background and motivate one partner more than the other to keep a low profile and not dare risk the encounter with others. The family history showed that avoiding attention was essential to survive in war times. This was truer for a Jewish family like the partner's family of origin who indicated social anxiety symptoms. Now, however, the war is over, and the parents' education continues to have an effect on this partner and prevents the further development of the couple as the affected social system. If the social anxiety becomes redundant, the previously social anxious partner explains that he would intensively like to enjoy the new freedom. This, in turn, provokes anxiety in the other partner, who up to now has represented the couple to the outside world, and was happy not take too great a leap. What is needed is not simply a solution to the social anxiety symptoms, but rather a shared construction of what life could be like without the previously shared social anxiety. This would include altered and healthier communication, and interaction patterns.

Mid-phase: Experimentation

In this stage of therapy, it is important to try out potential *opportunities for change ("experiments")*. The therapeutic stance is of high importance, especially when outreach interventions and innovative solution scenarios are performed in the everyday environment of the affected social system. Relevant to action is an *optimism for change without pressure to change*, framed by caring humour while playing with symptoms and having fun with friendly absurdity and unusual experiments. Core interventions include the working with circular questioning and hypotheses (Penn, 1982; Cecchin, 1987), symptom prescription in accordance with the Milan approach (Selvini Palazzoli et al., 1975), and choral speaking (Schweitzer et al., 2020; Hilzinger et al., 2021).

Systemic questioning and hypothesizing

Systemic questioning and hypothesizing, especially addressing circular phenomena, allow a better understanding of the communicative and interactive vicious circles of an affected social system. Circular questions address dyadic interactions, e.g., when a therapist (A) asks how one person (B) thinks about another person (C). Similarly, triadic interactions can be considered when the therapist (A) asks how a person (B) experiences the interaction of two or more other persons (C, D, etc.). This way of asking may appear strange at first, but what is asked is part of our daily life: we do not only react to what others do, but rather to what we think others think about us (expectation–expectation). When all social system members are involved in the therapy session and experience what one system member thinks about the other, then everyone learns something new (Simon and Rech-Simon, 1998). The goal is to make clear that every communication embodies a content and relationship aspect and that in disruptive events it is usually less about the content but more about the underlying unmet needs within the social system. Well-informed alternative ways of communication consequently can be developed and tested for a more appropriate conflict resolution. There are various modes of systemic questioning that serve this purpose, including solution/wonder questions, contextualizations, operationalizations, aggravations, optionalizations, historical questions, and scalings (Table 7).

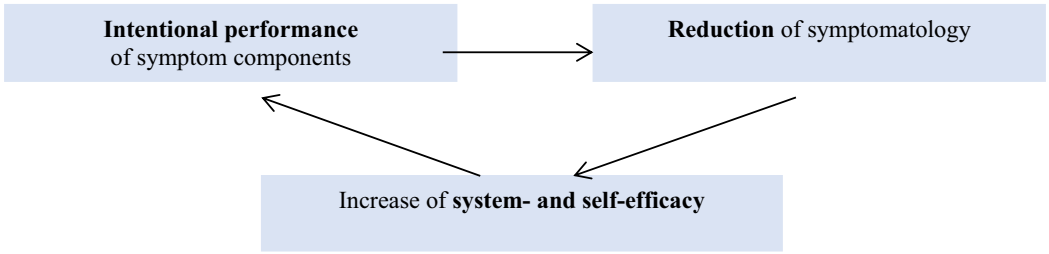

FIGURE 4
Rationale of symptom prescription (Hunger, 2021).

Symptom prescription: "If you have a symptom—Use it!"

The Milan approach (Selvini Palazzoli et al., 1975) was in close exchange with the Heidelberg School (Stierlin, 1976). Epistemologically, *symptoms are understood as an independent element* indicating the quality of an affected social systems, functioning. To introduce a difference in the therapeutic setting that makes a meaningful difference (Bateson, 2000), clients are invited to perform something unexpected, i.e., to intentionally (not) perform the symptom components (e.g., physiological, behavioral, cognitive, and emotional). This is associated with symptom reduction (e.g., less shaking and/or blushing in social anxiety disorders) or symptom escalation (e.g., strong shaking and/or blushing). The aim is no longer at the solution of the symptoms as this has already been tried many times in vain. Contrariwise, symptom prescriptions proved to be particularly helpful when change had failed, or too early changes bore the risk to threaten the survival of the affected social system. For example, symptoms of social anxiety may have been reduced from 6 h to 3 h the day before the performance of a speech; if, however, attractive alternative goals are missing, responding to the question with whom and what one will spent the 3 h of gained free time, suicidal tendencies can arise to fill the increasing emptiness.

The symptom components are usually prescribed in isolation. Positive symptoms (e.g., "Do [show, think, feel] what you already do [show, think, feel]") can be addressed (e.g., "Try to sweat as strong as possible, and even stronger, before meeting strangers!"; "Shake so much that you tip over your glass of wine at the garden party and submerge your mother-in-law's dinner!"). Likewise, negative symptoms (e.g., "Do not do [show, think, feel] what you do not do [show, think, feel]") can be addressed (e.g., "Do not tell anyone that your career aspiration actually is totally different to your father's ideas!"; "Be sure to stay at the bar next to the dance floor in the discotheque and by no means dance with your friends, even if your favourite song is playing!").

> "Such ritualized prescriptions of communication and interaction patterns create an exacerbation of the situation in a humorous way. They make clear what is going on, respect it as meaningful, and create a certain pressure not to keep up this nonsense" (Schlippe and Schweitzer, 2016, p. 334).

The goal of symptom prescription is to deliberately perform selected symptom components. The affected social system decides when certain symptoms are allowed to come on stage. This way of dealing with symptoms causes a reduction in the symptomatology and increases the affected social systems' experience of system- and self-efficacy (Figure 4).

The framing of the symptom prescription can be performed as directive as in the 1970th Milan approach, including a confronting closing commentary (Selvini Palazzoli et al., 1975). In the ISFT, we have adapted the Milan approach based on our experience in nowadays systemic therapy. Creating an arc of tension, options for scepticism on the one hand and the commitment of all social system members on the other hand are of particular importance to increase the success of the intervention (Table 8). In addition, we have developed a three-step approach by prescribing *problems*, *solutions*, and *avoidances*. The actual performance of the symptom prescription (*in vivo*) is as valid as its hypothetical enactment in the context of system- and self-reflection procedures (*in sensu*). It is important that the situation to be addressed, and the behavior to be proved, are planned together with the social system members and in accordance with their goals, resources, and the social contexts that arise curiosity (Table 9).

Choral speaking: Turning self-doubt into rhythm and music

Incisive negative beliefs represent mental models which have the power to entrap a person into a so-called problem trance. A problem trance is usually referred to as a trance state that arises when a client mentally enters a subject of high emotionality (Schlippe and Schweitzer, 2016). Such beliefs can be recognized by the following phenomena: (1) sentences in which one blames or accuses oneself, (2) sentences that are emotionally charged but not necessarily explicit, and (3) sentences with which one becomes discouraged, resigned, or fearful. With the choral speaking method (Schweitzer-Rothers, 2006), these sentences can be externalized and beliefs expressed in the sentences can be questioned. The stressful emotions are set in motion, become more and more flexible and distanced from the clients. The goal is to broaden both the clients' thoughts and bodily sensations which co-carry these feelings, till new solution-oriented ideas emerge in kind of a "solution trance." Choral speaking is easier the more

TABLE 8 Closing commentary introducing a symptom prescription (Schweitzer et al., 2020).

Process	Example
Summary	"We [therapists] have been talking to each other, and our impression is that you are a very committed family: the fact that you have managed to come here as a four-person family and engage with each other in the hope of getting better, that's truly remarkable."
Invitation to participate	"We came up with an idea and we invite you to try something out." Important: *Control remains with the affected social system; it is allowed to deny the invitation to experimentation!*
Creation of an arc of tension	"Of course, trying something new is always risky, too, so it's good for you to think carefully about whether you are ready to take that risk or not."
Enabling scepticism	"The risk is that you can be faced with a change of your situation, for better or for worse! You may see advantages and disadvantages in that change, and perhaps you have already expressed them."
Commitment of all social system members	"We cannot start the experiment until everyone is really ready and feels confident enough to engage in this experiment." Important: *Ask for a true commitment and wait until each social system member is ready! Possibly let another (few) therapy hours pass before addressing the symptom prescription again.*
≫ Formulation of the symptom prescription	

TABLE 9 Three-step approach of symptom prescription (Schweitzer et al., 2020).

Steps	Task, system- and self-reflection
Problem prescription	Task: e.g., Tuesday, 7–7.30 pm: Preparing spaghetti with tomato sauce, with all the *problem* symptoms at hand, including the partner. • One partner cooks, shakes, sweats, oversalts the pasta, spills the tomato sauce, and trashes the kitchen. • The other partner watches TV with friends and calls into the kitchen in the meantime: "Honey, is everything okay? It smells so burnt!" System- and self-reflexion: Both clients reported a very stressful week. The symptom prescription could not be implemented.
Solution prescription	Task: e.g., Tuesday, 7–7.30 pm: Preparing spaghetti with tomato sauce, with all the *solution* symptoms at hand, including the partner. • One partner cooks, having all utensils well-arranged at the beginning of the scene, and listens to his favorite classics while first preparing the pasta and then the tomato sauce, well-seasoned. • The other partner watches TV and comes into the kitchen in the meantime, looking over the cook's shoulder, smelling with pleasure the aroma rising from the pots and says with a kiss: "Honey, that smells so really delicious, I'm truly looking forward to our meal!" System- and self-reflexion: Both clients reported a very stressful week. The symptom prescription could not be implemented.
Avoidance prescription	Task: e.g., Tuesday, 7–7.30 pm: Preparing spaghetti with tomato sauce, with performing an avoidance situation by arranging the meals on the table and subsequently leaving the house without a word and any reaction of others. System- and self-reflexion: All clients reported a less stressful week. The symptom prescription was performed. When the door was about to close on leaving the house, the cooking partner felt the urge to know what his meal tasted like after all. However, the door closed. The cooking partner had forgotten the key, and ringing the bell was not possible in this moment. In his first thought, he realized: "I want to be evaluated, but preferably positive, not negative!" The second thought showed: "For positive evaluation I need social contacts!" The third thought included: "If I avoid evaluating situations, I exclude myself. That has a negative impact, above all on myself, because I also exclude possible compliments and the joy of being together with my friends! In addition, it works also most negatively for my friends who likewise experience to be excluded from my life at the time when I am outside and not part of the company at table!"

people are present. The smaller the therapy system, the more the therapist must serve as both conductor and choir.

In line with the ISFT manual, the supervisor, six clients and their therapists met once during a therapy in a group session which lasted 3 h. The first part consisted of getting to know each other, with a special focus on the different goals that clients wanted to achieve within the therapy. The second part was essentially the choral speaking method, where clients' belief systems are sung by the group until the clients begin to show altered reactions. (1) Clients write down their individual answers to the following questions on a flip chart: "What scares me?," "Who is to blame?," "What cannot I change?," and "What would I have to do to make it worse?" (problem-trance). Likewise, the following questions are noted: "Where do I feel safe and in good hands?," "With whom do I experience such moments?," "What can I change?," and "What can I do to make it more like I want it to be?" (solution-trance). (2) This is followed by an exchange in small groups of two or three clients and/or therapists. (3) Together with all clients and therapists, the sentences which have the strongest power to knock someone down as well as the sentences associated with intense positive emotions are identified. (4) Two large choruses are formed. The "problem choir" intones the most concise problem-trance sentences. The "solution choir" intones the most concise solution-trance sentences. The choirs each sing for one client. The client stands in front of the choir, with the supervisor as the conductor, and lets the sung sentences have an effect on him or

her. (5) Problem-trance sentences are sung aloud or quiet, fast or slow, at least 10 times, with a short break between each repetition, until the client's reaction changes. This can be anger at oneself (e.g., "Why do I torture myself so much!"), differentiating ideas (e.g., "That's not always true!"), re-evaluations (e.g., "The second row gives much more freedom for self-care than the stressful positon of a front woman!"), or new posture ideas (e.g., laughter, or the song "The Bare Necessities" in remembrance of the Jungle Book). The new impulse is introduced into the chorus as a new phrase. The majority of the singers continue to sing the old phrase while a minority alternates singing the new phrase. In a singing contest, the conflicting movements compete against each other. In the listening client, new, third, fourth, fifth, etc. movements are often perceived. These reactions are integrated into the concert by their performance as new voices increasingly differentiating sub-systems of the choir. The process ends when the listening client feels the increase of (more) power and energy, or at least peace and calmness. (6) Solution-trance sentences are sung shorter. Their listening represents a ceremony. If they are botched, they lose their effect. When the listening client has recorded an inner soundtrack of the choral speaking, the choir ends. (7) A debriefing closes the choral speaking methods.

Final phase: Stabilization, prolapse prevention, and evaluation

At the end of the ISFT, we and the client(s) reflect on the path we have travelled together in therapy. We congratulate the members of the affected social system on their progress and success. The focus is on the *stabilization* of the changes achieved. The goal is to make experiences from the therapy helpful for dealing with possible and expected "re-invitations" to future social anxieties in the sense of *prolapse prevention*. This includes exploring negative consequences of missing future *rounds of honor in the old pattern*: "What will be missing and become more stressful or conflictual if others experience you as less anxious in the future?." This is often followed by a collection of good reasons for future prolapses: "What are benefits you associate with staying more or less socially anxious?"

We use *timeline work* (Suddaby and Landau, 1998) and allow for a glance into the future: "How and with whom do you (not) live, love and work in 3, 6, or 12 months?, What important things have (not) happened when and with whom?, Which challenges have (not) been mastered with whom and how?, Which challenges still have to be (not) overcome with whom and how?" *Balances* clarify (1) what has been changed, and which social system members contributed, (2) which change steps have (not yet) been performed, and (3) how life can continue even with the unchanged. The goal is that all social system members applaud themselves and the others for what has been achieved and give their blessing to be able to find peace with what currently could (not) be changed or will (not) be changed in the future. A shared *farewell ritual* serves as a transition to a life without therapy. A *comeback* is also possible. Even if we make a clear cut and do not extend therapies beyond what is refunded by the national health insurance, we remain open to meeting again after an appropriate therapy break based on success. The length of this break is negotiated with the affected social system. The comeback neither depends on the social system members being in a current crisis. It rather becomes possible with the presentation of a new concern which could not be well addressed in former therapy hours.

Pilot randomized controlled trial

Following the studies of Willutzki et al. (2004), Rakowska (2011), and Leichsenring et al. (2009), we aimed to investigate the IFST for social anxiety disorder (SAD) considering its feasibility and trends of change in psychological, social system, and global functioning. This section will summarize the findings published in the original pilot RCT (Hunger et al., 2016a, 2020). The interested reader can find a detailed review of studies and evidence of psychotherapies for the treatment of SAD elsewhere (Hilzinger et al., 2016).

Design

We used the well-established Cognitive Behavioral Therapy (CBT) as a comparator (Clark and Wells, 1995; Stangier et al., 2016). Previous studies of systemic therapy for SAD have focused on individual therapies (Willutzki et al., 2004; Rakowska, 2011). The study by Leichsenring et al. (2009), the probably largest psychotherapy study on SAD, exclusively compared CBT with Psychodynamic Psychotherapy.

We conducted a prospective multicenter, assessor-blind randomized controlled trial (RCT; CBT: Center for Psychological Psychotherapy; ISFT: Institute of Medical Psychology; Ethics Committee of the Medical Faculty of Heidelberg University: S-190/2014; registered with the U.S. National Library of Medicine, ClinicalTrials.gov: #NCT02360033).

Methods

Sample size calculation and randomization

According to Cocks and Torgerson (2013), we aimed to recruit a minimum of 32 patients for a powered two-arm pilot study. Considering a possible drop-out rate of 25%, we decided not to stop recruitment until 38 patients were enrolled and allocated. An independent allocator team performed block randomization to CBT or ISFT, and subsequently randomized patients to therapists (Efird, 2011). They then sent assignment information to the study director (CHS), who forwarded them to the staff members (Hunger et al., 2020).

Patient, social system members, and therapists

We screened 252 interested persons, and of these, 38 *patients* were allocated to CBT and ISFT, respectively (CBT: 20 patients; ISFT: 18 patients). The patient flow can be found elsewhere (Hunger et al., 2020). Patients were almost equally men and women in their 30s with similar education levels, mainly married or living with a partner. *Social system members* were mainly married or living with a partner, well-educated and employed spouses or partners, parents, (best)friends, children, or siblings. *Therapists* were mostly educated females in their 30s, and the majority was married or living with a partner. Study arms were well-balanced with respect to patients' data at baseline.

Therapist training, adherence, and allegiance

No therapist had practiced the CBT or ISFT manual before the trial started, so therapists all participated in three 3-day CBT or ISFT *manual trainings*. Subsequently, every therapist performed a training phase including the treatment of two patients. Experts in CBT and ISFT provided supervision every fourth therapy hour. Over the course of the study, CBT therapists' global *adherence* showed smaller deviations (CTAS-SP: $M = 2.18$; $SD = 0.29$; 0 = no adherence, 3 = very good adherence; Consbruch et al., 2008). ST therapists' global adherence was frequently demonstrated (STAS: $M = 2.51$; $SD = 0.66$; 0 = not at all, 3 = very often; Hilzinger et al., 2016; Hunger et al., 2020). In accordance with Borkovec and Nau (1972), we asked for the therapists' *allegiance* to either CBT or ISFT (i.e., CBT: "How enthusiastic are you about CBT?"; ISFT: "How enthusiastic are you about ISFT?"; 1 = not at all, 5 = very much). Therapists' allegiance did not differ between study arms (CBT: $M = 3.95$, $SD = 0.59$; ISFT: $M = 4.10$, $SD = 0.38$; $t(31) = 0.868$, $p = 0.392$).

Comparator intervention

The CBT manual (Clark and Wells, 1995; Stangier et al., 2016) works with the individual patient aiming at (re-) establishing a realistic self-perception in five therapy phases: (a) generation of an idiosyncratic version of the disorder and identification of safety behaviors; (b) manipulation of self-focused attention and safety behaviors, including role play and video feedback; (c) training in attentional redeployment and reduction in safety behaviors through behavioral experiments (expositions), cognitive restructuring and changing of dysfunctional convictions; (d) relapse prevention; and (e) refreshment and consolidation. Sessions were performed weekly and in the phase of relapse prevention every 2–3 weeks. Therapy sessions were mainly 50 min long, but with allowances to extend up to six sessions to a maximum of 100 min to facilitate behavioral experiments.

Results

We will summarize the results of our pilot RCT in an overview, concentrating on the estimation of effects based on Cohen's d for dimensional between- and within-group effects, and Cohen's h for categorical between-group differences (Cohen, 1988). A detailed description of all instruments and results, including all test statistics and calculations, can be found in the original publication of the pilot RCT (Hunger et al., 2020).

Within-group, simple-effect intention-to-treat analyses of the *patients' ratings on the primary outcome* showed a significant reduction in social anxiety (Liebowitz Social Anxiety Scale, LSAS-SR; Rytwinski et al., 2009), with large effects seen in both conditions from baseline to end of therapy (CBT: $d = 1.04$; ISFT: $d = 1.67$). The intention-to-treat mixed-design ANOVA comparing CBT and ISFT showed a significant large effect to the advantage of ISFT ($d = 0.81$). Per-protocol analyses supported these results.

Considering the *secondary outcomes, blind diagnosticians* use the Structured Clinical Interview (SCID; Wittchen et al., 1997; First et al., 2016) and rated seven CBT patients (46.7%) and 14 ISFT patients (77.8%) as no longer demonstrating clinically relevant SAD symptoms at the end of therapy ($\chi^2(1) = 3.422$, $p = 0.083$; IRR at 94%, range: 91–100%). Within-group, simple-effect intention-to-treat analyses showed their ratings pointing to significant improvement in global functioning (GAF; Aas, 2010) in both conditions with large effects (CBT: $d = 0.92$; ISFT: $d = 1.50$; IRR at 94%, range: 82–100%). The intention-to-treat mixed-design ANOVA showed a significant medium effect to the advantage of ISFT ($d = 0.76$).

Within-group, simple-effect intention-to-treat analyses of the *patients' ratings on the secondary outcomes* showed a significant improvement in psychological functioning on the Beck Depression Inventory (BDI-II; Kühner et al., 2007) in both conditions (CBT: $d = 0.50$; ISFT: $d = 1.71$). The intention-to-treat mixed-design ANOVA showed a significant medium effect to the advantage of ISFT ($d = 0.77$). Significant improvement was also observed in within-group, simple-effect intention-to-treat analyses on the Global Severity Index (GSI) of the Brief Symptom Inventory (BSI; Geisheim et al., 2002) in the ISFT ($d = 1.89$), but not in the CBT. The intention-to-treat mixed-design ANOVA showed a significant medium effect to the advantage of ISFT ($d = 0.77$). Considering social system functioning, within-group, simple-effect intention-to-treat analyses of the Experience in Social Systems Questionnaire (EXIS.pers; Hunger et al., 2017) showed a significant improvement in both conditions (CBT: $d = 0.23$; ISFT: $d = 1.06$). The intention-to-treat mixed-design ANOVA was not significant.

Within-group, simple-effect intention-to-treat analysis of the *social system members' ratings on the secondary outcomes* showed a significant reduction on the psychosocial Burden Assessment Scale (BAS; Hunger et al., 2016b) in both conditions (CBT: $d = 0.56$; ISFT: $d = 0.59$). The intention-to-treat mixed-design ANOVA was not significant. Significant improvement was also observed in within-group, simple-effect intention-to-treat analyses on the GSI in the ISFT ($d = 0.14$),

but not in the CBT. Additional outcomes can be found elsewhere (Hunger et al., 2018, 2020).

Considering *clinical significance*, the level of patients' remission (LSAS-SR) in CBT was 15%, response 55%, no change 25%, and deterioration 5%. For ISFT, the level of remission was 39% (*h*: 0.55), response 56% (*h*: 0.01), no change 1% (*h*: 0.57), and deterioration 0% (*h*: 0.45; Hunger et al., 2020).

Discussion

We developed a manualized disorder-specific ISFT for SAD, evaluated for its feasibility in a multicenter, assessor-blind pilot RCT, and compared it to manualized and monitored CBT (Clark and Wells, 1995; Stangier et al., 2016). The discussion will concentrate on recommendations for the use of the ISFT manual in further studies, and for a confirmatory RCT to test the reported effects on psychological, social system and global functioning including both the patients and their social systems (e.g., family, couple; co-workers).

Acceptability of the manual and the interventions

Manual structure

At the beginning of the ISFT project, the manual structure was designed strictly parallel to the number of hours and sequence of sessions of the CBT manual (Stangier et al., 2016), as this was the comparator. Initially, the therapy sessions followed each other closely, often weekly, and more sessions were agreed upon than proved useful and necessary. Therapists reported a feeling of "methodological pressure" from the manual: e.g., "I thought that I have to have my genogram interview ready after the second session as it is part of the initial phase. So, if I wanted to keep to the manual structure, I thought I had to hurry." In the course of our pilot RCT, the ISFT therapists increasingly designed their own style of how to use the manual. They allowed themselves to omit manualized interventions, e.g., a third symptom prescription after two previous ones that had already been successful, when patients and therapists did not expect it to bring about further meaningful difference. At the end of the project, the ISFT dosage demonstrated a minor number of therapy hours compared to the manualized 25 h, and to the comparator in the per-protocol-analysis (CBT: $M = 26.00$ h, $SD = 0.00$, no range; ST: $M = 22.50$ h, $SD = 2.57$, range: 17–26; $t(31) = 42.524$, $p = 0.000$, $d = 2.48$). These findings support our stance toward the perception of the ISFT manual as an ideal suggestion from which there are good reasons to deviate in individual cases. As we already said in the ISFT introduction above, it seems optimal to us *to take the ISFT manual sufficiently serious, but not too serious*. This is why all interventions are interchangeable in their order, and why therapy planning in the ISFT can already start in the first therapy hour. It has not to wait till, all information have been collected at the end of the initial phase.

Systemic interventions

Therapists also reported that the ISFT manual had made it possible "for me to approach a lot of things more quickly." The use of the *initial phone contact* (Prior, 2010) allowed the therapists to work solution-oriented already before an encounter with the clients. It turned out to be an enculturation into the ISFT. Clients no longer came to the therapy with the expectation of having to present as many problems as possible in order to get access to treatment ("ticket to admission"; Goldberg and Bridges, 1988). In none of the ISFT patient-therapist-dyades did we perceive the "culture clash" often described in the practice of systemic therapy. This becomes evident when patients believe that they must communicate problems while therapists strive for solutions. This phenomenon also includes social system members when present during the ISFT.

The *Social Network Diagnostics* (Hunger et al., 2019) was mentioned by the clients, diagnosticians, therapists and researchers to be very useful for the detection of social system members, e.g., partners, family members, and other important caregivers. Both diagnosticians and therapists described the conductance of the Social Network Diagnostics on par with the SCID interview and highly supportive to include significant others in the therapy process either as significant relative or friend, and/or additional client with clinical problems. Therapists also reported that the Social Network Diagnostics made it easier for them to address and negotiate changes of social relationships which is at least as important as changes of SAD symptoms detected with the SCID.

Therapists also took methodological suggestions from the ISFT manual. This was most often the idea in case of the *symptom prescription*. Due to the historical closeness of the Heidelberg School (Stierlin, 1976) to the Milan approach (Selvini Palazzoli et al., 1975), we ascribed a great importance to this classical and nowadays still innovative systemic method. The therapists particularly liked our adaption of the Milan approach into a three-step approach by prescribing problems, solutions, and avoidances either *in vivo* or in *sensu*. The current German landscape of systemic therapy appears to incorporate a pronounced solution-orientation. As a result, the symptom prescription with its directive nature is rarely and less explicitly trained. In the ISFT, solution prescriptions invited therapists and patients to make a first encounter with the symptom prescription. As a result, a curiosity arose on the part of both therapists and patients to try out problem prescriptions as well. Avoidance prescriptions were experienced as particularly tricky. They often highlighted the price patients paid to protect themselves from negative criticism, making it impossible, for example, to experience any positive feedback simultaneously.

The obligation to conduct *multi-person conversations* at least once in each therapy phase encouraged the therapists to conduct settings with more than one representative of the affected social system. Additionally, the *choral speaking* was new to therapists and patients and became one of the core interventions to stimulate meaningful change from the patients' and therapist' viewpoint (Hilzinger et al., 2021).

Study procedures

Recruitment

A larger budget for the recruitment of *patients* is needed in future RCTs. We screened 252 individuals, and of these, 189 were heard on initial screening phone calls, each lasting about 20–30 min. SCID interviews were performed with 101 individuals lasting about 60–90 min. This costly procedure was required to finally include 38 patients in the pilot RCT. Though the drop-out rate was zero for the ISFT, it was at 25% for the CBT. The budget for recruitment for this pilot RCT was inadequate and comprised the timeliness of the study as well as the more advanced investigation of therapists' adherence and competence which is crucial for the sophisticated interpretation of study results.

There are often difficulties reported with respect to the inclusion of *social system members* in psychotherapy research. In our pilot RCT, however, this was not the fact but rather an easy game. Based on our experiences from our pilot RCT, we recommend the early application of the Social Network Diagnostics (Hunger et al., 2019) as it allows for the identification of those social system members who appear to play an important role in the development, maintenance and change of the addressed symptoms.

It was difficult to recruit *therapists* with substantial experience in multi-person settings. Although it is seen that the work with families, couples and social networks is at the core of systemic therapy, it is evident that currently multi-person settings are hardly trained in German psychotherapy. Therefore, future studies should give a special focus in the ISFT manual training and supervision of therapies like we implemented in our pilot RCT.

Diagnosticians

The insufficient funding for recruitment procedures equally applies to the budget for blind diagnosticians. Currently, the hourly rate for external psychological diagnosticians is about 100€, if they are not permanently employed due to a lack of funding. We saw about 100 interested persons in 60–90 min SCID interviews. Again, the funding was insufficient and should be better supported by appropriate structural working conditions. so that diagnosticians can be hired for the study period.

Randomization

The randomization was appropriate and the independent allocator team worked well performing block randomization (Schulz and Grimes, 2007) using a pseudorandom number generator (www.randomization.com; McLeod, 1985). Patients, social system members, and therapists knew which study-arm they were being allocated to, though not about the specific research questions. We do not see this as a disadvantage of our pilot RCT as transparency is a fact of "real word delivery of care" (Zwarenstein et al., 2008, p. 6).

Control group design

CBT as an active comparator worked well in our pilot RCT. It, however, showed a 25% drop-out after the initial clinical interview. The reasons for this were the demand for a stronger integration of the partner and/or family into therapy, the experience of therapy demanding too much or the detection of another primary diagnosis compared to SAD.

Furthermore, essential characteristics of systemic therapy were abandoned in favor of comparability between the ISFT and CBT as the active comparator. Systemic therapy grounds in a collective intervention culture that meets with the affected social system in multi-person settings approximately every 3–4 weeks (Schweitzer, 2014). CBT, however, belongs to individual intervention cultures and sees mostly one single patient each week. The preconditions thus were uneven to the disadvantage of the ISFT. Future studies should investigate whether differences may appear less between different schools of psychotherapy than in the nature of the performed setting. It can be assumed that by treating an entire social system, the relapse rate of individual members with previously diagnosed mental disorders appear reduced (Morgan et al., 2013). This may be due to a better balance of interpersonal in addition to intrapersonal conflicts, the recognition and multidirectional negotiation of differences in each social system members' need for related autonomy (Stierlin, 1976) and increased options for the evolvement of an integrated prosocial support within the affected social system (Holt-Lunstad et al., 2010).

Instrument and test administration

The reported instruments are validated, easy to administer and impactful measures that serve well as primary and secondary outcomes for ISFT in SAD. This is even more successful as the primary outcome of ISFT is not a symptom reduction but an improvement of social system functioning. The primary effect of ISFT, assessed with the LSAS as an instrument asking for social anxiety symptoms, was therefore measured with an instrument that is less close to the actual intent and mode of action of the ISFT. Future studies should concentrate on a broader acquisition of the social system functioning, considering its different facets.

Online data collection worked well in kind of a "Data Café," accompanied by cakes, cookies and/or coffee, which we implemented in a comfortable room for both study arms. Study staff was always available to answer questions. Since there was no fundamental criticism against the online assessment *via* the online platform UNIPARK, we recommend online data collection in future studies for economic reasons with respect to the study management, and to ensure no missing or potential data entry errors in the assessment procedure.

Outcome trends

The statistical results need interpretation with caution, since the nature of a pilot trial is its small sample size that is not

sufficiently powered to test hypotheses of program efficacy. Our pilot trial, however, used an adequate power for a two-arm pilot RCT based on the rationale of Cocks and Torgerson (2013). The trend obtained in the LSAS as the primary outcome for psychological functioning was positive and encouraging. Results also indicated significant treatment effects on additional aspects of psychological and social system functioning to the advantage of the ISFT, including blind diagnosticians' ratings of patients' remission from SAD as well as their global functioning. Social system members likewise reported a reduction in their psychosocial burden, and improvement of psychological functioning. This finding fits well into the socio-psycho-biological explanatory model (Figure 1; Luhmann, 2017; Hunger et al., 2018): changes in one person are reciprocally associated with changes in the other person ("spill-over effect"; Keeton et al., 2013), pointing to mental disorders as interpersonally shared realities and the need to include all important social system members in psychotherapy to empower sustainable change (Morgan and Crane, 2010). The overall positive trends of the ISFT compared to CBT in our study bode well for a larger powered RCT.

Conclusion

Our manualized disorder-specific new ISFT for SAD was evaluated for its feasibility in a multicenter, assessor-blind pilot RCT, compared to manualized and monitored CBT. Both the creation of the manual, its acceptability by therapists, patients, and social system members, as well as the efficacy trends calculated for the ISFT bode well for a subsequent confirmatory RCT. The pilot findings indicated integrity of the study methods and procedures, a favorable acceptance of the manual by therapists, patients, and social system members. We however suggest minor adjustments to recruitment, instruments, test administration, and a stronger emphasis on the flexibility of the ISFT manual. The promising results indicate a fully powered RCT concentrating on the social system functioning, in addition to the assessment of patients' symptomatology, to be feasible and worth of future investment of time, effort, and funding.

Data availability statement

The datasets presented in this article are not readily available because raw data cannot be anonymized. Requests to access the datasets should be directed to CHS, christina.hunger-schoppe@uni-wh.de.

Ethics statement

The RCT involved human participants. It was reviewed and approved by the Ethics Committee of the Heidelberg Medical Faculty (S-190/2014). The patients provided their written informed consent to participate in this study.

Author contributions

CHS, JS, and RH conceptualized and designed the RCT. CHS, LK, LD, RH, JM, and AS contributed substantially to the data analysis, and together with JS and HB contributed to the interpretation of the study results. JS drafted the first German version of the ISFT manual, complemented and revised by CHS, RH and HL. CHS drafted the English version of the ISFT manual. JS is first author of the original ISFT manual, and CHS is first author of the original publication of our pilot RCT. All authors critically reviewed this publication for important intellectual content. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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A cultural-ecosocial systems view for psychiatry

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While contemporary psychiatry seeks the mechanisms of mental disorders in neurobiology, mental health problems clearly depend on developmental processes of learning and adaptation through ongoing interactions with the social environment. Symptoms or disorders emerge in specific social contexts and involve predicaments that cannot be fully characterized in terms of brain function but require a larger social-ecological view. Causal processes that result in mental health problems can begin anywhere within the extended system of body-person-environment. In particular, individuals' narrative self-construal, culturally mediated interpretations of symptoms and coping strategies as well as the responses of others in the social world contribute to the mechanisms of mental disorders, illness experience, and recovery. In this paper, we outline the conceptual basis and practical implications of a hierarchical ecosocial systems view for an integrative approach to psychiatric theory and practice. The cultural-ecosocial systems view we propose understands mind, brain and person as situated in the social world and as constituted by cultural and self-reflexive processes. This view can be incorporated into a pragmatic approach to clinical assessment and case formulation that characterizes mechanisms of pathology and identifies targets for intervention.

KEYWORDS

multilevel explanation, embodiment, enactment, ecosocial, looping effects, cultural psychiatry, clinical case formulation, systems theory

Introduction

Current psychiatric research assumes the mechanisms of mental disorders can be understood in terms of neurobiology, especially brain circuitry. However, mental health problems clearly depend on developmental processes of learning and adaptation through ongoing interactions with the environment. Human environmental niches are socially and culturally constructed. Symptoms or disorders emerge in specific social contexts and predicaments that cannot be fully characterized in terms of brain function but require a larger ecological systems view. Causal processes can begin anywhere in this larger ecosocial system. In particular, individuals' narrative self-construals, culturally mediated interpretations of symptoms and coping strategies, as well as the responses of others in the social world, can play a crucial role in the mechanisms of mental disorders, illness experience, treatment response, and recovery. In this paper, we outline the conceptual basis and practical implications of this hierarchical systems view for psychiatric theory and practice. We argue for the importance of adopting a *cultural-ecosocial systems view* that understands the brain as situated in the social world and as part of larger, self-reflexive systems that are embodied and enacted through language and other cultural practices (1). This view builds on work in systems biology, social epidemiology, developmental psychology,

anthropology and 4E cognitive science to provide a process-based view of the dynamic interactions of subjective experience and social context.

We use the term 'ecological' here in a way that is related directly to ecology [as the study of biological organisms in relationship to their physical environments (2); see (3, 4)] but with the recognition that for humans, the environments in which we are embedded are fundamentally social and cultural. What flows through these organism-environment systems is not just energy or material (as is the case in typical ecological analysis) but also information, which is essentially relational (5). The material and symbolic (informational) dimensions of our environment are closely related. We inhabit socially constructed niches that enable communication and cooperation (6). We employ cultural knowledge and practices to navigate these niches, which are both local and extended through time and space. In the process, we both actively reconfigure these niches (7) and are reshaped by them at neurobiological, cognitive and social levels (8).

The cultural-ecosocial view encourages us to consider how cognition and experience depend on the dynamics of the system comprising organism and environment. By emphasizing systemic processes, this view takes a step away from narrow concepts of mechanism that assume the total decomposability of a system into its parts (reductionism), with the recognition that the ways that the parts or constituents of systems are spatiotemporally arranged and connected give rise to new dynamics. System dynamics arise from connectivity, organization and interactions not simply from the properties of the components. Interactions between components may change the properties and function of each of the components as well as the dynamics of local and larger networks.

In the sections that follow, we first provide a brief genealogy of systems thinking in psychiatry and outline the specific contributions of the existing frameworks that we draw from. We then discuss the nature of hierarchical organization in biology before turning to a discussion of multilevel explanation in psychiatry. The next section argues that 4E cognitive science can provide a path to multilevel integration through a cultural-ecosocial systems view. We then illustrate with a case vignette how this approach can be applied to integrative clinical case formulation. The cultural-ecosocial systems approach includes patient's experience, self-understanding and agency, as well as social structural processes, in explanations of symptoms, disorders and distress. Finally, we discuss the implications of our approach for psychiatric practice. We are calling for a change in psychiatric theory, research and practice that resists the reification and over-simplification of mental health problems in terms of discrete diagnostic entities by focusing on system dynamics that include individuals' experience and meaning-making as well as the social-cultural contexts in which the person is embedded and from which psychiatric disorders emerge.

Systems thinking in psychiatry

The concept of *system* is associated with Enlightenment views of knowledge and has been a central trope in modernity associated with ideas of order and control (9). However, a more abstract notion of system has served as of way to identify important analogies and formal correspondances among diverse phenomena. In this usage, a system is a structured ensemble of parts or processes (components, actors or agents) that interact in ways that allow the structure to persist over time and exhibit distinctive behavior or dynamics. The recognition that very different kinds of ensembles may display similar dynamics reflecting their organization led to the development of general systems theory (10-12) and cybernetics (13). The application of systems theory received new impetus with the development of computational approaches to modelling dynamics. Mathematical analyses and computational modelling revealed complex dynamics emerging from even simple systems spawning the development of subfields of nonlinear systems theory, and popular re-branding under the banners of "chaos" and "complexity theory" (14–19). The focus on dynamics supports an ontology in which systems are characterized not in terms of their constituent parts and structures but rather in terms of interactional processes (20, 21).

The concepts introduced in general systems theory and cybernetics were applied widely to modelling behavioral, biological, ecological and social-economic systems [for overviews see (10, 22, 23)]. Efforts to understand biological processes at genomic and cellular levels led to the development of systems biology (24). In this view, the function of components of biological systems like genes, organelles, cells, tissues and organs can only be properly understood by considering their relation to the dynamics of the larger system as a whole. Understanding these dynamics holds great promise for improving clinical approaches to the assessment and treatment of myriad complex medical conditions (25, 26).

Systems thinking has a long history in psychiatry, going back to the development of the notion of homeostatic regulation of physiological systems in the work of Walter Cannon (27), and some of the early applications of systems theory (28). Psychiatrists and neuroscientists were key figures in the development of cybernetics in the 1940s and 50s (29). This work aimed to model learning and adaptation in mechanistic terms and identify forms of pathology with specific types of dysregulation of adaptive systems. Subsequent work applying systems thinking to understand psychopathology was inspired by systems biology (32), the cybernetics of behavioral control systems (33–36), complexity theory (37, 38), and recognition of the impact of social-structural determinants of health (39). A recent version of control systems modelling can be found in the active inference approach to explaining specific forms of psychopathology (40). While focused initially on neural processing, active inference can be readily extended to consider interactions with the environment and social networks, (41–44).

Systems theory and cybernetics were central to the development of family therapy (45–48). Families were viewed as self-regulating systems comprised of individuals in interaction with each other (49). These interactions are influenced by individuals' characteristics but also reflect spatial, material and symbolic structures as well as the social practices, norms, rules, and rituals that constitute family life. The family system is constituted both by the individuals who are its members and the community, society or culture that configures and constrains its structure and identity. The family system thus serves the needs of its members and of the larger society in which it is embedded—and these diverse needs may sometimes conflict with each other. While there have been substantial efforts to elaborate sets of dimensions, typologies, and measures to characterize the structure and dynamics of families [e.g., (50–54)], to date, none have achieved wide acceptance or clinical application. The interactional view of

family systems has been extended to consider larger social networks and structures (55-58) but this is also an unfinished project (59).

In the 1970s, second-order cybernetics theory emphasized the role of recursivity, self-reference and self-construction (*autopoiesis*) in living systems (60). This opened the way to a deeper engagement with social, cultural and linguistic processes of meaning making (39, 61–63). Agency, subjectivity, and narrativity are given central place in systems approaches that acknowledge the role of communication, storytelling and self-reflection in human experience (45).

There are many interconnections among these different approaches to systemic thinking in psychiatry. This reflects both their shared genealogy, with common ancestors, and cross-fertilization among disparate strands. These lines of work are complementary and each can address some of the limitations of the others. In particular, systems neurobiology focuses on multilevel processes in the nervous system but does not sufficiently consider the social environment or treats it simply as a modulator of neural processes rather than as constitutive of brain function. Systems biology has been extended to consider biosocial interactions, but this work often does not specify the psychological processes of meaning and experience that mediate bodily and social interactions (64). Krieger's (65, 66) ecosocial epidemiology uses the construct of embodiment to emphasize the biological effects of structural inequities (i.e., how adversity gets "under the skin") but also does not clarify psychological processes. Bronfenbrenner's (67-68), bioecological psychology emphasizes the dependence of developmental processes on environmental context but its application has not always considered the interaction of the multiple levels of social organization in which individuals and families are embedded (69). Ecocultural approaches grounded in ethnographic methods have provided ways to characterize the culturally constructed meanings and practices that constitute lifeworlds and developmental pathways (70). The notion of an ecology of mind, introduced by Bateson (61, 71) views cognition as emergent in loops of individuals interacting with the environment and through interpersonal communication with other humans in a social system (72). The many strands of 4E cognitive science develop this perspective in terms of processes of embodiment and enactment that involve social embedding and extension in the world (73–76). The cultural psychiatric perspective emphasizes the interactions of individual and collective meaning making and the social-political contexts of institutional power and practice that create cultural niches and affordances (77). Computational methods allow us to put aspects of each of these approaches together in an overarching model that can reveal system dynamics (78). The novel aspects of our approach that distinguish our framework from previous work include: the explicit integration of culture (as embodied background knowledge and enacted situated practice); the characterization of basic psychological processes of subjectivity, narrativity, and agency in terms of embodiment and enactment; and a focus on the dynamics of multi-level biological, cognitive and sociocultural looping effects as potential mechanisms of pathology and targets for intervention.

Hierarchical systems theory in biology

Biological systems are hierarchically organized, with components that are arranged in ways that give rise to stable structures with new properties and processes (20). For example, the metabolic processes of the cell depend on the spatial organization of enzymes on its membranes. The computational functions of the brain depend on its hierarchical structure of networks and nodes (79). This organizational process is recursive and new control processes emerge as a result of the hierarchy (34). This hierarchy includes the social environment which emerges as part of specific arrangements of relationships with others through social norms, rituals, institutions, and practices—and which, in turn, shapes the development and functioning of the individual.

The notion of hierarchy sometimes conjures images of domination or oppression. However, as we use it here, hierarchy does not involve value judgments about degree of importance, power or privilege but refers to specific forms of organization of systems (80). Some philosophers are critical of the idea of hierarchy and levels in living systems because they see this as imposing a misleading model or metaphor on phenomena that are fluid, shifting, or 'holistic' (81).[1] Others are concerned about the notion of 'top-down' causation, arguing that causal processes can only involve same-level processes that are materially linked (83). In reality, top-down causation is common in complex systems and is central to organismic biology (84). There are many types of organization that can be discerned in the world or applied to experience and the utility of concepts of hierarchy and levels depends on the specific question, problem, object of interest and pragmatic task at hand (85, 86).[2]

The notion of hierarchy is used in multiple ways in biology that include *subsumption*, *composition*, *scale*, *causality*, and *control* (88, 89). Hierarchy implies organization into levels, but the significance of these levels differs in each of these versions of hierarchy. In biology, each of these notions of hierarchy is useful but the one that is most important for an ecosocial systems view in psychiatry is that of control hierarchies.

Subsumption hierarchies are classifications in which something is seen as a member of instance of a larger category. An example is a Linnean taxonomy of species taxa. The logical relationship between levels can be captured by set theory. The elements of progressive levels are sets of the prior level's sets. Elements at lower level may be viewed as concrete instances, while higher levels are abstractions, or each level may have a kind of ontological identity (90). A lower-level instance can stand metonymically for the whole. But the way that elements are

1 There is no doubt that notions of hierarchy reflect sociomoral and political values (73), but this does not vitiate their use as technical concepts in science or other domains.

2 Of course, there is legitimate concern about the need to recognize oppressive structures in society but these are not simply due to hierarchically structured systems. Oppression can arise not only from the dominance of one group over others but from systemic processes that occur at multiple levels in the system. For example, collective norms and public discourse can legitimate discrimination, micro-aggressions and social exclusion with significant effects on the health of minorities. Hence, it is important to distinguish between hierarchical structure as an organizational feature of complex, self-organizing, goal-oriented systems and oppressive processes that make use of hierarchies, but also other aspects of social structure and everyday practice, to exert power in ways that create inequity. Ecosystems and social systems might be better characterized in terms of the concept of "panarchy" in the sense that they exhibit both top-down and bottom-up causation often on different spatial and temporal scales (78). The potential for conflict between these levels of causation and control leads naturally to a consideration of the dynamics of social power.

grouped into larger sets of sets can provide a conceptual structure, represented by a graph or lattice that represents the way that the groupings are based on specific facets or properties of the elements.

Scale refers to the number or the size of the assembly relative to its components, spatial or temporal span. Scale differences can be continuous or discrete. Some biological and social network-based phenomena are 'scale free'; that is, the same structural organization and dynamics are observed at multiple scales or else scale-up in a quantitatively predictable way (91, 92, 93). This allows dynamical system models to be applied in an iterative way to characterize processes across these networks at multiple scales. However, many physical and biological phenomena are not scale free; that is, size matters(94–96). The sheer number of elements, their topological arrangement or connectivity, and their spatial or temporal extent can give rise to new dynamics. In this case, the emergence of new dynamics marks a new level in a hierarchical structure.

In *compositional hierarchies*, the focus is on part-whole relationships (97). The parts are building blocks that are arranged in spatiotemporal structures that create a new level of organization. Bricks are laid to build a wall; walls joined to build a room; rooms are concatenated to build a house; houses are arranged to create a neighborhood. The process of composition may involve different kinds of arrangement at each level and similar processes may be involved in stabilizing the structures (e.g., mortar may be used to build walls, to join them into rooms, and to join rooms into a house). However, different processes (reflecting other properties of the components or additional components) may stabilize structures at different levels (buildings might be joined by mortar to build a wall and walls might be joined by interleaving bricks at a corner, or by at angle brackets made of metal). Depending on our focus of study, the level and processes we need to explain a phenomenon will shift. Thus, if we are looking at the stability of a house we will be interested in the strength of bricks and mortar bonds, and the buckling properties of columns and frames; whereas, if we are interested in neighborhood stability, we will need to consider parameters at other compositional levels like street layout, greenspace, and social relationships among inhabitants. However, we may find that house stability and neighborhood stability significantly affect each other because of mechanisms that link these through social and economic processes such as house pricing, gentrification, neighborhood pride and upkeep.

Compositional hierarchical organization is central to biology and essential to phylogeny, ontogeny, and adaptation to new environments because biological systems build on existing structures by preserving, re-organizing, and re-purposing components (98). In biology, there are multiple compositional hierarchies, but the main line follows from the ways that processes are stabilized to create a hierarchy of material structures (99): molecules are joined to make macromolecules (through chemical bonds); macromolecules are arranged in space (with the aid of membranes and other macromolecules) to produce organelles; organelles are arranged in space (again with the aid of membranes, macromolecules and other organelles) to create cells which have metabolic cycles; cells are organized into tissues which have biomechanical and other functional properties; tissues are organized in organs which can perform multiple functions related to their structure and anatomical location; organs form physiological systems, which have properties related to interactions between the organs they connect; physiological systems constitute organisms; organisms form communities; and diverse communities in environmental context constitute ecosystems.

Causal hierarchies reflect arrangements determined by mechanisms or processes that produce a given effect (100, 101). The directionality of the link (or irreversibility of the process) establishes an ordering. The ordering of causes leading to outcomes which are causes of subsequent outcomes provides a sequential structure that can be described as a chain of cause and effect. Of course, most processes have multiple causal contributors that interact and result in different partial orderings or lattice structures that may have a layered or hierarchical structure. Moreover, multiple causes may independently lead to the same outcome (*equifinality*), and single causes may lead to multiple outcomes (*multifinality*), presumably reflecting the influence of other historical or concurrent causal factors. Finally, the assumption of unidirectionality at one causal level may not hold when the larger system of relationships is considered. Most biological systems involve mutual or circular causality or feedback loops. Indeed, circularity (autocatalysis, self-assembly or autopoiesis) is essential to what characterizes a system as living (102–106). Through such circularity and self-reference, biological systems then instantiate another form of hierarchy that involves self-regulation or control.

Control hierarchies are defined in terms of successive levels of regulatory loops (107). The control systems perspective is especially relevant to understanding biological processes (and psychopathology) because it leads to a useful way of understanding function and dysfunction in terms of the goal-oriented nature of behavior and adaptation. A basic building block is a feedback loop in which a state of the organism or environment is compared with an expected (or desired) state [what Miller et al. (34) called a 'Test-Operate-Test-Exit' or TOTE unit]; the discrepancy then drives a compensatory action (either revising the expectation or acting on the world to make it better conform to the expectation). Successive levels are loops of loops. These loops can involve different processes that are best characterized as regulating information (or 'free energy') rather than energy *per se* (108). This is the kind of hierarchy of greatest interest in making sense of the dynamics of living systems. For living systems, these loops are characterized by a fundamental regulatory goal of maintaining organism integrity and persistence in the service of reproduction and other goals. The resultant *teleodynamics* distinguish living systems from other regulatory systems that lack the capacity to generate organism-specific goals and norms and to function in ways that are explicitly informed by future possibility (109, 110).[3] In humans, this process extends to the self-reflexive, imaginative and cooperative processes of agency enabled by language and culture (112, 113).

The general idea of hierarchy then *does not* imply unidirectional (top-down or bottom-up) causation, linear dynamics, or reductionism. In fact, evidence for hierarchical organization is seen in many emergent phenomena. Emergence involves the appearance of new levels of organizational structure without implying loss of underlying structures or component levels (114). These new levels of organization have their own dynamic processes. The emergence of new structures with distinctive properties and of processes with new dynamics

3 We use the term "teleodynamic" in a way similar to Deacon (99), who contrasts *teleonomic* systems that can be *interpreted* as pursuing a goal state, from *teleodynamic* systems that actually pursue goal states as basic to their structure (see 100, 101).

warrants the use of the concept of *levels of organization* and corresponding levels of description.

In hierarchical systems, the function of each level can be explained not only through the interactions of its components but in terms of its relationship with both higher and lower levels. For example, the genome is a set of structures used by the cell to regulate its activity and replicate itself; the genome itself is a dynamic system that is regulated by a network of macromolecules (115). Similarly, the cells of a healthy multicellular organism serve the priorities and plans of the whole organism—sometimes to the detriment of their individual survival.[4] The functions of any level in a biological system then only make sense in relation to the dynamics of the larger system, including the regulatory processes organized at higher levels. The principle of *biological relativity,* developed by physiologist Denis Noble (117–119), argues that in biological systems causal chains can begin anywhere within the system or hierarchy. This approach to systems biology recognizes the organizational value of hierarchy but is explicitly anti-reductionist in the sense that both lower and higher levels of organization have causal efficacy and contribute to the dynamics of the system as a whole or the subsystems that constitute brains, persons, families and communities.

Multilevel explanation In psychiatry

The biopsychosocial (BPS) approach championed by Engel (120, 121) promised a conceptual framework to integrate multiple levels of analysis in psychiatry based on general systems theory (12). The motivation for this was a concern to give a place in clinical theory and practice to the intrapsychic processes characterized by psychodynamic theory and patients' own experience and understanding of their condition (122). But the definition and operationalization of these level and their exact interplay in cross-level formulations, were left undetermined. Critics of the BPS, like Ghaemi (123) have argued that the framework is little more than a placeholder with no real content to guide diagnostic assessment, formulation and treatment (124). To a large extent, this claim says more about critics' failure to engage the burgeoning literatures of systems biology, psychophysiology, family systems theory, social epidemiology, and other social sciences, which can put ample flesh on the bones of the BPS model, than about any inherent limitations of a multilevel systems approach to health and illness (125, 126. The lack of engagement with this literature is evident in Ghaemi's alternative proposal that psychiatry employ mechanistic biological accounts of disorder complemented by phenomenology and a humanistic concern for patients' experience. In this approach, the causal mechanisms of psychopathology are divorced from the social world. Subjectivity and social context are acknowledged as important to ensure a humane engagement with the patient but are not seen as primary mechanisms of pathology and are taken for granted as aspects of the patient's clinical presentation that can be adequately accessed and assessed with empathy and common sense.

While Ghaemi's concern that the BPS leads to "undisciplined eclecticism" seems to us to be unfounded, more valid concerns are that in practice the BPS remains mainly descriptive rather than dynamic, simply enumerating potential risk, causal or maintaining factors, without detailing causal mechanisms that could guide intervention. Perhaps this is why, despite its widespread acceptance, the BPS has failed to prevent or reverse the adoption of reductive biological explanations in psychiatry. Moreover, while the BPS was motivated by concerns to include patients' lived experience, even mental health practitioners who claim to use a BPS approach tend to neglect subjectivity and social-cultural context. This failure may reflect the lack of interdisciplinary training (127,128), the difficulties of conceptual integration (81), and the persistence of dualistic thinking (129).

We start from a different premise, supported by a wealth of research in psychosomatics and sociosomatics, that insists that symptoms and syndromes in psychiatry arise from the interaction of psychophysiological, cognitive-affective, and sociocultural processes (77). Psychiatric disorders are complex, multidimensional constructs, and symptoms are more than just indices of an underlying neurobiological mechanism that can be captured by biomarkers (130, 131). Psychiatric disorders emerge within loops that involve the biology of human adaptation as well as cultural practices of diagnostic labelling, health care systems and larger discursive formations. Illness experience therefore does not follow directly from pathobiology but is embedded in cognitive and social processes that mediate and modulate the translation of physiological or psychological disturbance into symptoms and behaviors. This transduction and translation occurs at multiple levels that involve symptom schemas and their interaction, interpersonal responses, narrative conventions, social positioning, the health care system, economic constraints and sociopolitical processes (132)[5].

This perspective is consistent with recent work in symptom network theory, which suggests that psychiatric disorders result from the dynamic interaction of multiple symptoms each of which may have its own pathophysiology or psychopathology (133), (136). Instead of assuming that a single latent construct can explain the symptom patterns that characterize psychiatric disorders, network analysis views disorders as systems of causally connected symptoms (137). These causal connections can involve physiology, behavior, experience and interpersonal interaction, as well as the responses of social institutions and the environment.

4 Multicellular organisms regulate and "police" their own constituents in ways that contribute to the survival of the whole organism (through allostasis and reproduction) at the expense of the viability of individual cells (106).

5 We use the term 'translate' here deliberately, not only to capture the fact that higher order neurocognitive processes involved in language mediate the effects of social stimuli on physiology (e.g. 133) but also, because in responding to symbols and situations the brain must "translate the relations between single elements of a given situation (stimuli) into wholes". The dynamics of cognitive systems involve the regulation of information, which resides in the relationship of organism to context (134). Human systems have both dynamic and linguistic modes that require corresponding descriptions. Our self-descriptions, narratives and metaphors, on this view, participate in the dynamics of adaptive systems but to do so, they require a translation (i.e. a meaning- and context-sensitive mapping) from the pragmatic communicative situations of linguistic communication (and representation) to the dynamics of brain systems and physiology.

While some authors consider a network as an inherently non-hierarchical structure, causal or control hierarchies may be part of the mechanisms that constitute and connect symptom networks, not as a matter of composition (or latent constructs) but as part of causal chains or loops. The ecosocial systems view we outline in this paper extends the idea of symptom networks to include social-cultural contexts, self-reflection and narration as active causal processes (1).

These multiple levels of process reflect structures that are organized hierarchically in the sense that higher organizational levels involve arrangements of structures at lower levels that give rise to new processes that require new conceptual vocabularies to describe. For example, the brain is composed of functional circuits, which are made up of neurons; the social world is made up of roles, niches and institutions which are constituted by patterned relationships among individuals, whose behavior is regulated by cognitive maps, models and affordances, social positionality, norms, and conventions (138). Each level enables processes that contribute to the causal mechanisms that underlie a particular symptom, syndrome or affliction (139). Experience, behavior, narrative self-understanding, and social interactions can all contribute causally to the dynamics of psychiatric symptoms and disorders (140–142).

Even brain-based explanations of mental disorders require an appeal to multilevel systems dynamics (143). Changes in synaptic function or neural circuitry alter information processing, which in turn gives rise to changes in social behavior and experience(144). The process is bidirectional. Psychotherapy and other psychological interventions have effects on the brain(145). Changes in social behavior alter brain function in ways that may be self-sustaining or create knock-on problems in other brain systems or behavioral functions. Social environments and models of the self in context influence neurobiology, immunology and inflammatory processes (142).

Beyond neurobiology, mental disorders also involve cognitive, affective and attentional processes that emerge from particular learning histories and narrative modes of recollection and self-narration, as well as interpersonal interactions with others in one's family, community and wider social networks. These social interactions have their own dynamics that may aggravate or mitigate symptoms or create predicaments that present their own challenges to health and well-being. Social interactions can also feed back into cognitive and bodily processes in ways that amplify or diminish symptoms and distress. These loops correspond to relationships between different aspects of the organism or between the organism and the environment. Loops may result in cycles of positive and negative feedback, with effects locally as well as across the organizational hierarchy. Depending on their structure, parameters and initial conditions, loops can result in nonlinear dynamics, for example, growing exponentially, showing discontinuities, bifurcations, or other complex dynamics (146, 147). To the extent that these loops have their own dynamics, they can be viewed as specific mechanisms that need to be considered in diagnostic assessment and case formulations and that can be the target of clinical intervention. Moreover, because human adaptive systems involve regulatory or allostatic processes with specific goals or set points, they may exhibit *equifinality*, in which, despite variations in initial conditions and ongoing perturbations, they tend to follow a predictable trajectory.

Identifying these stable patterns or trajectories could provide a basis for a typology of disorders organized in terms of regulatory processes that exhibit stable attractors, limit cycles, and final common pathways.[6] If these can be identified and empirically validated, they could be used as a basis for diagnoses that are *prognostic* (predicting outcomes) or that indicate potentially effective treatments, and that point to specific targets for intervention. This systems-based nosology, however, will generally be quite different than simply identifying single mechanisms, causal factors, or etiologies for disorders because it involves dynamic properties of systems with looping effects.

A typology of looping effects (vicious or virtuous) could complement current diagnostic nosology (149). This enlargement of frameworks would not completely supplant current nosology, which has its uses, insofar as it captures salient aspects of illness experience and can be related to prognosis or differential therapeutics. Clinical assessment routinely goes beyond diagnosis to include a problem list—some categories of which are included in the ICD and DSM-5 Z-Codes (150, 151)—and case formulation that may note contextual factors, but this process is unsystematic. Efforts to systematize the inclusion of social context and determinants of health in assessment are urgently needed. This needs to go beyond a laundry-list of factors to include dynamics. Person-centered diagnostic assessment includes characterizing strengths and resources, risk and protective factors, and relevant developmental, ecological and meaning-centred contexts (152). Attention to looping effects could be incorporated into current practice through case formulation and systemic intervention without waiting for the development of a systematic nosology. Table 1 lists some of these potential loops both within levels or domains and across levels using depression as an example.

Although loops are difficulty to study, they are composed of causal arcs that can be characterized with existing methodologies. Table 1 lists many such causal arcs that linked together would result in 'loopy' dynamics. This kind of model is central to cognitive theories of depression and anxiety (179), which have led to effective treatment interventions and can readily incorporate cultural-contextual factors (180). There have been some notable successes in identifying predictors of dynamics in couple interactions (181). New experimental methods have been developed to study the dynamics of dyadic, family, and group interactions (182–184). Symptom network theory and computational modelling provide new approaches to examining looping dynamics, testing the relative strength of specific linkages and the sensitivity of network dynamics to changes in parameters that can be matched with measurable variables in research and clinical applications [e.g., (185–187)]. In clinical settings, nonlinear dynamics are commonly observed and putative explanations in terms of loops could be tested by interventions that target specific parameters (188, 189).

Identifying the feedback loops that may contribute to psychopathology is difficult. Statistical methods can be used to show time-lagged autocorrelations and cross-correlations in observational data that suggest feedback dynamics (190, 191). Experimental methods that manipulate particular parameters or control the nature of physiological, perceptual or interpersonal feedback can provide firmer evidence for feedback mechanisms(192). Computational models can be constructed that capture some of the interactions and identify parameters that affect

6 For definitions of these terms and others used to characterize system dynamics, see: Mainzer (21); for examples of how they may be related to specific types of pathology; see: Durstewitz et al. (132).

TABLE 1 Examples of Looping Effects Related to the Mechanisms of Depression and Treatment Response.

Domains	System dynamics and looping effects		References
	Within levels	Across-levels	
Neurobiological	Psychopathology involves self-sustaining loops in neurobiological, autonomic, endocrine, and other regulatory systems that are related to reduced stress tolerance and increased vulnerability to chronic stressors	Depression is linked to HPA dysregulation which leads to impaired stress response, and to symptoms including alterations in sleep, appetite, reward processing, emotion regulation and cognition. These alterations affect cognition, coping and interpersonal interactions in ways that can exacerbate depression	(153) (154)
	Treatments that alter synaptic transmission lead to habituation or compensatory responses; this might decrease the efficacy of some medications over time, cause rebound on medication cessation, and increase the risk of relapse; e.g., denervation supersensitivity from receptor blockade	Decreased efficacy of medication leads to fear of relapse, demoralization, decreased self-efficacy, social avoidance, and, ultimately, less efficacy of medication Rebound effects of medication contribute to more challenging withdrawal and continuation of medication	(155)
	Medication works at multiple brain and body sites and affects systems with multiple functions causing 'side-effects' that may contribute to or undermine therapeutic efficacy	SSRIs can reduce emotional reactivity with impacts on emotional responsiveness, self-understanding and ability to connect to others. SSRIs interfere with sexual function and decrease libido, which may have negative effects on self-esteem and on intimate relationships	(156) (157)
Psychological			
Affective	Impaired emotion regulation leads to decreased cognitive flexibility, increased irritability, dysphoria, anxiety with consequences on sleep, cognitive processing including negative bias and self-appraisal, worry and rumination, problems with impacts on learning and performance which reduces stress tolerance and increases emotional distress	Impaired emotional regulation has negative impacts on goal-directed behavior and can increase perceived chronic stress which, in turn, is linked to HPA dysregulation and maladaptive coping (e.g., dysfunctional behaviors such as substance use and social withdrawal)	(158) (159) (160)
	Emotional distress interferes with functioning, leading to performance decrements, negative self-appraisal, and greater emotional distress	Emotional distress is linked to others' response to emotional expression and can lead to interpersonal problems and avoidance of social situations with loss of social support, and increased experience of loneliness	(161) (162)
	Mood influences memory, leading to difficulty accessing mood-incongruent memories, and greater recollection of mood congruent memories, reinforcing dysphoric mood	Depression alters autobiographical memory, which leads to negative self-presentation, impaired social functioning and more negative memories	(163)
Attentional	Attention to negative social cues increases sense of threat and difficulty in social functioning Reduced attention to positive stimuli	Increased attention to negative social cues and signs of failure exacerbates depressive mood and social withdrawal; Focusing on positive faces reduces dysphoria	(164) (160)
Attributional	Attributing sensations to pathology leads to the conviction that one is ill, increasing the tendency to attribute sensations to pathology	Attributing sensations to depression leads to depressed mood	(165)
Embodied experience	Bodily habitus, stance and facial expression shape experience	Slumped posture, frown influence feelings of depression	(166), (167)
Social - Micro			
Family systems	Family influences development across the lifespan and also provides a niche and resource for adaptation	Early adverse experiences both *in utero* and in early childhood can initiate changes to basal and stress-related cortisol secretion. This impacts stress tolerance. Caregiver response in infancy shapes interoception, self-regulation, ability to attune and attach, also laying the ground for future interpersonal relationships and response to perceived stress. Depression alters family dynamics	(168)

(Continued)

TABLE 1 (Continued)

Domains	System dynamics and looping effects		References
	Within levels	Across-levels	
Interpersonal	Reactions of others to distress influences illness experience and coping Withdrawal of others leads to emotional distress and behaviors that prompt further withdrawal by others	Social withdrawal can lead to lack of perspective fostering feedback and support which may lead to deepening of dysfunctional behaviors and negative self-biases in addition to limiting corrective experiences. Depressive symptoms lead others to increase social distance Social rejection alters neural functioning in ways that can lead to further withdrawal Behavioral activation leads to increased social activity with more rewarding experiences improving mood leading to greater activity	(169) (170)
Social - Meso			
Neighborhood	Neighborhood and community can modulate impacts of micro and macro-level factors Sense of belonging and access to a social network/community contributes to wellbeing and social capital with impact on opportunities to thrive	Sense of belonging and support impacts sense of agency and self-identity. Experiences of being excluded, judged or ostracized as part of a community can lead to social withdrawal or isolation, self-doubts, loneliness and induce other dysfunctional behaviors and impair coping	(171) (168)
Work	Job loss impacts self-esteem, social standing, resulting in low mood, and economic hardship	Low mood and demoralization impede job search, performance and retention Others response to job-loss can shape coping strategies and amplify distress	(172)
Health care system	Type and availability of health care services and caregiving increases the tendency to seek care for specific types of symptoms or concerns	Distress is shaped by diagnostic categories and available treatments. Treatment response (which may include placebo effects) validates diagnostic categories	(173) (174)
Social - Macro			
Economic	Poverty increases risk for depression Financial stress can lead to negative affect and dysfunctional behaviors that worsen economic adversity	Depression increases risk of poverty Poor cognitive performance can impact economic status including status, reputation as well as income and assets.	(175) (176)
Transnational	Marketing of pharmaceuticals influences the availability of specific diagnostic labels and treatments, which are applied to patients who then become consumers of medications, increasing economic demand and encouraging further marketing	Reliance on medications increase sense of vulnerability and impairs coping May also impact agency and identity development	(177) (178)

dynamics (193). However, in practice, these usually are simplified 'toy' models that do not include many of the loops and variables present in real-world contexts. This may lead to mistaken predictions or over-generalization. There is a need for an extensive research program of modelling built on large datasets that include potentially important individual and contextual variables (194).

Applying computational models in clinical settings poses additional challenges related to the constraints of clinical epistemology. The data available for an individual patient may be very limited and not include a time-span necessary to reveal dynamics. The interventions that clinicians make are not really single-subject experiments because they occur within a context of expectations and demands that heavily constrain patients' response. The patient's own interpretations and self-construals affect the impact of any intervention and any subsequent interaction with the clinician. Hence, we need a circular hermeneutics to complement our models of circular causality (195). The system of patient and clinician must be included in the model and situated within the larger ecology of health care and adaptation in social context.

Crucially, the loops relevant to clinical concerns include modes of self-construal based on cognitive, social and cultural models, institutions and practices (77). For example, the interpretation of experiences of pain, fatigue or lack of interest as symptoms of depression is a culturally shaped attributional process that leads to particular modes of coping and help-seeking (149). These attributions may be re-negotiated in clinical and other social contexts with others who may validate or contest the views of patient or physician (196). To the extent these social and clinical responses validate the individual's self-construal, they constitute a loop in which the available categories for symptom interpretation and clinical practices reinforce

each other—an instance of what Hacking (197) has called "the looping effect of human kinds." These loops may be internal to the individual, involving bodily attention, interoception, and physiology (examples of what Hacking (198) termed "biolooping") or they may primarily involve cognitive and social-rhetorical processes that reconfigure the sense of self (173, 199). Loops also may be irreducibly social or political, changing the larger environment and available narratives in which social position and structural adversity determine the causes and course of symptoms. Psychiatry itself as a social institution participates in these loops through diagnostic labelling, discursive practices, and modes of social control that may aggravate or ameliorate suffering (200, 201). The types of problems included within the purview of psychiatry, the kinds of explanation and interventions used, and the larger context of practice are all part of the dynamic system that shapes experience and behavior.

4E cognitive science as a path to multilevel integration

Contemporary 4E cognitive science points to ways to conceptually integrate multiple dynamic levels of organizational complexity that involve neurobiological, social, cultural, and environmental contexts across spatio-temporal scales (187, 202–205). The 4E cognitive science approach argues that cognitive processes are *embodied*, *embedded* in social contexts, and involve *enactments* that *extend* into the world. *Embodiment* refers to the ways in which the body provides a scaffolding for cognition and experience.[7] *Enactment* emphasizes that embodied experience emerges through ongoing cycles of action and perception that engage the environment. Cognition serves adaptation, and a changing environment requires action to maintain the body and the person in a healthy, functional state (208). Human adaptive niches are cooperatively constructed. Action and experience therefore are *embedded* in social-cultural contexts. The action-perception cycles of cognition *extend* beyond the body to engage with the material and cultural affordances of a local niche and larger social systems. From a 4E perspective, both the experience and the mechanisms of health and mental disorders can be approached in terms of individuals' dynamic engagement with the social world.

Dynamic engagement with the social world requires constant adaptation and resource optimization. The concept of *allostasis*, which refers to the ways in which organisms anticipate and adapt to challenges, focuses on the function of physiological and biobehavioral systems of stress response and regulation (208, 209). Allostasis involves the organism's capacity to allocate resources to maintain an adaptive balance between coping and recovery in response to adverse conditions and events. This involves both internal physiological processes and behavioral strategies based on appraisal of challenges and available resources for coping (210). When allostatic regulation is insufficient, various forms of stress-related dysfunction can result from has been described as 'allostatic overload' (211).

The processes involved in allostatic regulation can be viewed from an enactive perspective as ongoing cycles of action-perception (212). They can also be modelled as Bayesian processes of active inference, in which the organism predicts and acts on the environment to ensure its own stability (108). These cycles occur internally through interoception and physiological regulation of the internal milieu and externally through behaviors that act on the body and the environment (213, 214). Cycles of action-perception also underlie our sense of agency both in terms of the sense of volition and control (215), and the wider sense of being able to change our social circumstances (216-218). The action-perception cycles that are constitutive of agency and subjectivity emerge in and are maintained by social-cultural contexts that involve other people in dyads or couples, families, neighborhoods and communities, as well as larger social networks and institutions (219). These larger ecological domains contribute to higher-order goals and plans. Problems in self-regulation and adaptation can originate at any level in this system, with potential repercussions throughout. Hierarchical organization of goals is part of healthy functioning and certain forms of psychopathology may result when stress or allostatic overload disrupts this organization (220).

Healing practices, therapies and treatment interventions can work to restore allostatic function where it has been disrupted. The overall aim of allostasis is to adjust regulatory systems to maintain the health, survival and reproductive fitness of the individual. More proximally, this includes responding to the challenges and demands of a social niche in ways that fit local cultural norms, roles and expectations. This may involve changing perceptions (learning new ways to attend to and interpret sensations from the body or the environment), taking new actions (enlarging the repertoire of behaviors and changing plans and priorities), or re-establishing links between action and perception that have been disconnected (providing feedback from outcomes that can guide recursive goal setting). Both internal changes and actions on the world can participate in the same adaptive cycles.

The 4E approach can be readily extended to include the essential functions of language in human adaptation (221). Humans are language animals (113), inhabiting a world that is comprised not only of physical arrangements but saturated with linguistically mediated meanings, which provide the content of social norms and conventions as well as the scaffolding for the construction of a narrative self. The *narrative practice hypothesis* focuses on how this linguistic capacity emerges developmentally through culturally prescribed practices of self-narration, giving rise to folk psychology with its grammar of motives, plans and intentions that are employed to organize memory and action, articulate individual goals, and offered to others as reasons and explanations for one's behavior (222). Linguistic capacities allow regulation of systems that are organized in terms of physical dynamics because narrative construals of self and context organize, constrain and modify lower-level action plans both within individual cognition and in communicative interactions with others. Language is self-referential and recursive and, through metaphor and narrative, is used by individuals and groups to construct novel multilevel hierarchies that regulate complex cognition and behavior. This is a key facet of the ways that culture permeates human cognition and functioning. Of course, language and culture reach deeper to reshape cognition,

7 The term *embodiment* is also used in Krieger's (188) ecosocial theory in population health to stand for the ways in which the social environment "gets under the skin" to affect physiology. These processes are central to understanding the social determinants of health. However, the notions of embodiment in 4E cognitive science draw from phenomenology (67) and cognitive-social psychology (150) to give an account of the process of sense-and meaning-making that can clarify the nature of illness experience and coping (1, 186, 189).

perception and action in ways that are nonconscious, implicit and automatic (167, 207, 223, 224).

Throughout the lifespan, culture shapes the human nervous system, allowing us to navigate socially constructed environments, engage in cooperative activities, and pursue our goals through embodied knowledge, skills, habits and dispositions (225). But much of culture remains outside the individual, distributed among others with specific expertise, residing in relationships, reproduced in institutions or practices, and present in social niches that provide cultural affordances for action and perception (226). These cultural affordances are part of the extended context on which human cognition and adaptation depend. Central to this context are interactions with other people, texts, and institutions. We rely on these interactions in local niches and relationships or larger networks to scaffold cognition, guide behavior and augment our capacities by "thinking through other minds"—whether in ongoing cooperative interactions with others or by consulting the vast archives of human knowledge and experience (44).

In summary, current elaborations of 4E cognitive science offer an account of human function in dynamical systems terms as embodied (coupling bodily physiology and experience), enacted (involving sensorimotor loops that give rise to agency), embedded (context sensitive), and extended into the environment (dependent on cultural affordances). By tracking the ways that processes of organismic self-regulation and experiential learning emerge from ongoing cycles of interaction between the individual and the social-cultural environment, this framework can integrate physiology, cognitive processes, including individual agency and self-construal, and participation in cooperative meaning-making. This allows us to recast basic processes of symptom production, distress, coping and adaptation as well as the response to interventions in terms of multilevel dynamical systems. This systemic view opens the way toward a conceptual approach that considers how the co-constituted systems of body, mind and person are in transaction with larger interpersonal, social and cultural systems.

Integrative case formulation

Comprehensive diagnosis and treatment in psychiatry requires addressing pathology in all its dimensions: biological, psychological, social, cultural, and environmental. Integrating these into causal explanations of particular types of problems remains a challenge for psychiatric theory and practice (126, 227). Approaching these multiple forms of explanations as independent or even incommensurable ignores the obvious ways in which processes at multiple levels not only affect but mediate each other. An ecosystemic approach to integration aims to identify multiple causal processes or mechanisms within and between levels of organization and articulate their connections in an overarching system.

Advancing integrative case formulation requires approaching the patient as embodied and embedded in an ecosocial niche that presents an array of inter-related social determinants of health with differential constraining and enabling opportunities. The same niche also provides models for self-understanding, values, aspirations, and afflictions that shape experience, adaptation, coping, and help-seeking behavior, as well as access to services, educational and vocational opportunities, and other resources. Individuals' responses to adversity, symptoms or disorders, and modes of recovery will be influenced by the norms, expectations, and constraints of the sociocultural contexts they inhabit.

To illustrate how this integrative perspective works in clinical practice, consider the following case vignette8:

> A 30-year-old woman presents to a mental health clinic with a self-diagnosis of depression. On inquiry, she reports feelings of emptiness, worthlessness, and guilt, as well as irritability, restlessness, rumination, difficulty concentrating, indecisiveness, early awakening, and fatigue over the past 6 months. Most recently, she has had increasing loss of interest and pleasure in ordinary activities and social isolation, as well as thoughts of death. She has done some online research and comes to the clinic asking for laboratory tests to confirm her diagnosis and determine the best treatment. She recently read a blog that mentioned novel research findings on the use of brain imaging and pharmacogenetics in personalized treatment for depression and presents the clinician with a list of private labs that offer this service. On further discussion, she reports that she lost her job three months ago and feels deep humiliation. She also mentions having difficulties in her relationship with her partner, saying that they are "going through a rough patch." She explains that she feels anxious and out of control and at times fears that she is "losing my mind." She is prescribed an SSRI antidepressant and experiences some lessening of her symptoms over the next few weeks, but does not feel any return of sexual interest, which adds to her worries about her relationship.

As is increasingly common in mental health care, the person in the vignette presents clinically with a self-diagnosis of depression and, in this case, expects treatment with medication for what she views as a brain-based disorder. She also has ongoing social stressors that may be both causes and consequences of her mental state. How she interprets her symptoms and her feelings of anxiety, hopelessness, humiliation, guilt or shame will affect both her behavioral and neurophysiological response to the predicaments of job loss and relationship strain. In addition to temperamental traits or constitutional predispositions and the neurobiology of mood regulation (228), a complex interaction of embodied processes—shaped by previous illness experience, life events, and the response of others—add reinforcing or attenuating loops that further complicate the system dynamics that underlie symptoms and distress. A clinically effective approach to explain and treat distress therefore must go beyond neural correlates and biomarkers to consider individual variations in phenomenology and lived experience (229, 230), developmental processes (231, 232), symptom trajectories (233, 234), and socio-cultural dynamics, which depend on social structure, institutions and practices, as well as cultural systems of meaning (218, 235, 236).

In the case of the patient in the vignette, the causal mechanisms of anxiety, demoralization and depression can (and likely do) start at many different points in the network depicted in Figure 1. Additionally, each of these processes can interact with potentially reinforcing or compensatory feedback loops. These dynamics are important for adequately characterizing the nature of the problem, its

8 This case vignette is a fictional composite based on the authors' clinical experience designed to illustrate cultural-ecosystemic formulation.

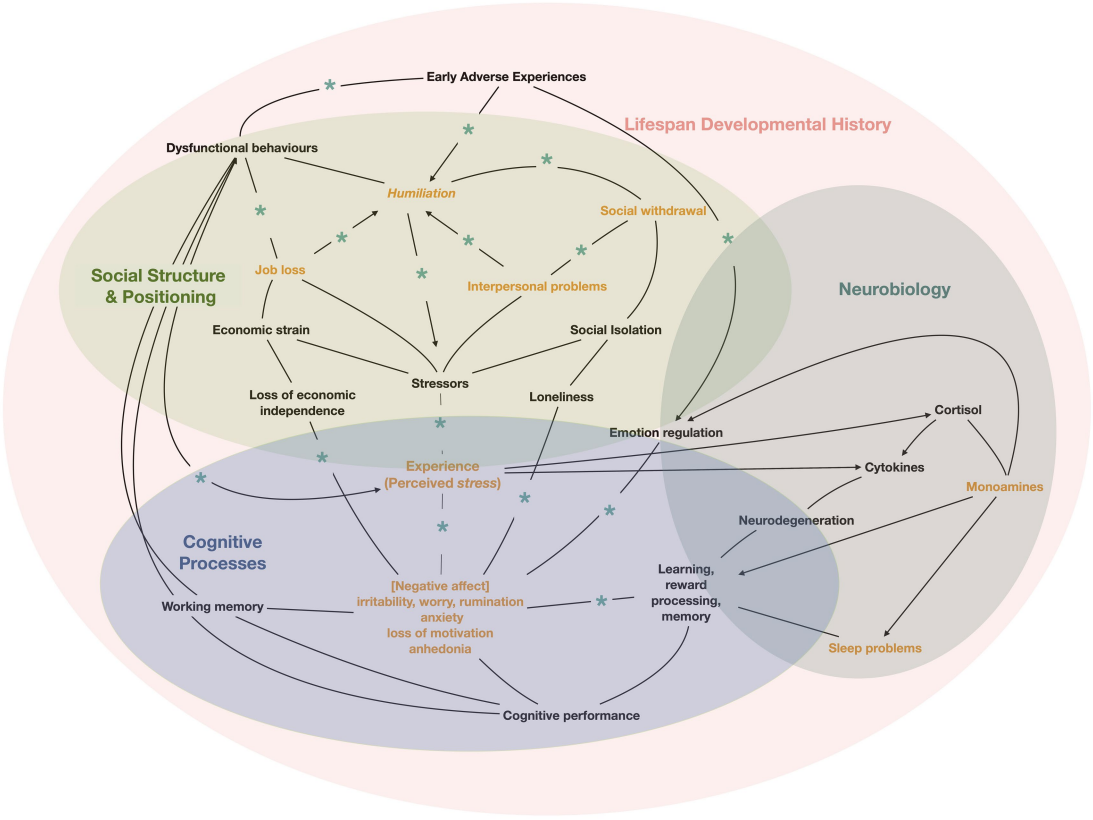

FIGURE 1
Ecosystemic Embedding of Depressive Symptoms. The figure illustrates some of the many links between symptoms, processes and experience that constitute the ecosocial system of the patient described in the vignette. The arrows represent causal influences mediated by diverse mechanisms. Closed loops can give rise to feedback amplification, resulting in vicious cycles of symptom exacerbation or, when regulatory mechanisms are sufficient, can lead to allostatic changes that contribute to resilience and recovery. For the links marked with asterisks, the mechanisms of influence depend on nonverbal and linguistic communication through embodied and enactive loops that give rise to intersubjectivity, positionality and ongoing negotiations of meaning as depicted in Figure 2. Based in part on (237).

likely course or prognosis, potential interventions, and treatment response.

Many of the links shown in Figure 1 are mediated by personal, social and cultural processes of meaning making. These involve bodily and discursive practices as depicted in Figure 2. While physical stressors may have direct effects on physiology and elicit responses, based on past experience, that occur outside of awareness, the impact of stressors also depends on individuals' perception and interpretation of the event. This involves embodied and enactive processes of meaning-making that build on developmental experiences and draw from cultural resources (204). The process of meaning-making includes the person's appraisal of the level of threat, their coping skills and resources, and the potential consequences—that is, "what's at stake" for the individual and others in their social world (238). For example, while job loss is likely to be a stressor for most people, the degree of perceived stress and ability to cope will depend on contextual factors including the personal and cultural meanings of one's occupation and of unemployment, current economic resources, social supports and mobility.

Shame and humiliation follow from experiences of loss of social status and failure in performing according to social norms (239). The experience of humiliation in response to job loss depends on its timing (e.g., family just moved for the job or has had other resource depleting stressors), social position, roles, norms and expectations (e.g., father expects to be a breadwinner). Social validation of perceived stress can also contribute to self-regulation and reduction of perceived stress through process of feeling understood, supported and protected, as well as helping the individual to shift perspectives, mobilize problem solving strategies, and access stress-reducing resources.

Perceived stress can prompt multiple maladaptive behaviors that feedback in loops that lead to resource depletion. For example, drug consumption for symptom control, relaxation and or escape can lead to emotional lability and irritability that challenge relationships. In favorable constellations however, response to perceived stress may lead one to develop new skills or positive schemas, overcome engrained biases, rescript self-understanding narratives, expand one's affordances, deepen social relationships and improve coping.

In the ecosocial systems view, interpersonal dynamics, work stress, gender discrimination, and cultural knowledge and practices for dealing with distress—all of which depend on or reside primarily in social interactions—may contribute to the patient's distress, coping strategies and process of recovery. Applying an integrative perspective in case formulation requires considering how these processes unfold over time in the individual's life trajectory. Moreover, the processes related to each of these levels and dimensions interact in ways that can give rise to feedback loops that exacerbate symptoms and result in a

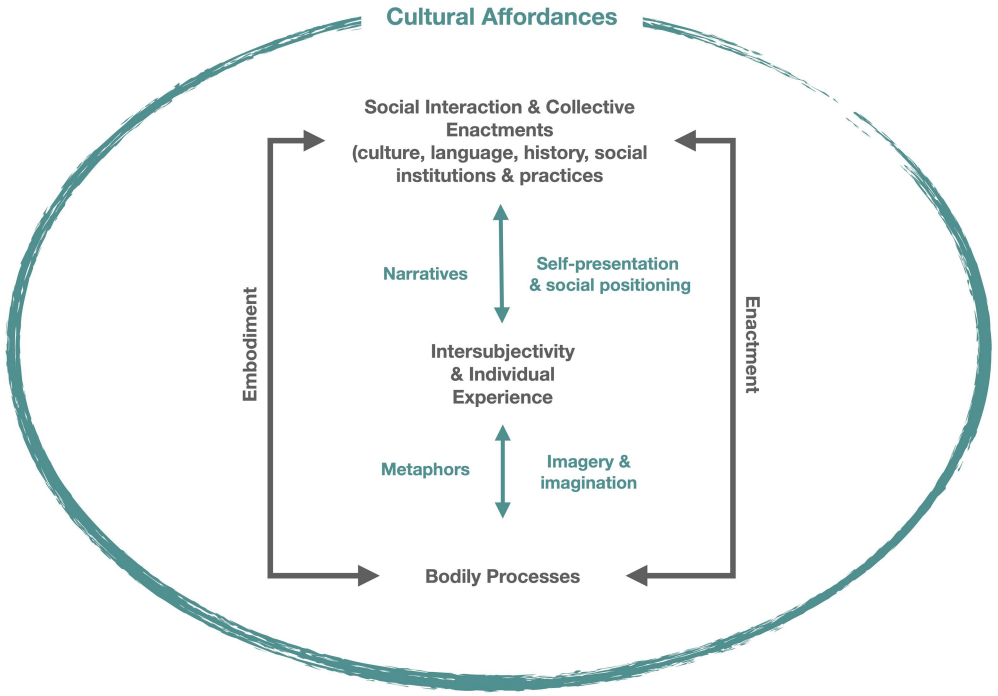

FIGURE 2
Embodied and Enactive Processes of Meaning Making. The figure outlines the cyclical processes of embodiment and enactment that give rise to meaning and experience. Experience emerges through developmental processes and engagement with others in particular social-cultural contexts. There is two-way traffic between bodily processes and individual experience mediated by cognitive processes of metaphoric thinking, imagery and imagination. Similarly, there is traffic between experience and social discourse mediated by interpersonal communication and narrative practices. All of this occurs in a field of cultural affordances provided by local niches and larger social contexts (Adapted from Figure 20.1 in (204); originally published in *Embodiment, Enaction,* and *Culture: Investigating the Constitution of the Shared World*, edited by Christoph Durt, Thomas Fuchs, and Christian Tewes, reprinted courtesy of The MIT Press).

depressive disorder or other syndrome, which may then be maintained through similar looping mechanisms (237). These loops are not only internal to the brain and its circuits but extend beyond the body to social interactions with other people and social institutions—all of which affect the development and course of psychiatric disorders.

The cultural-ecosocial approach is fundamentally relational. The relationships it considers involve material, informational and symbolic-communicational interactions between the individual and the environment. These relationships can be mapped by causal loop diagrams (CLD) that aim to capture the links between observable processes (240). These maps can be used to develop formal quantitative models to reveal dynamics and test the potential impact of interventions, including changes in the configuration of systems—e.g., by altering individual biology or cognition, family interactions, health care systems or other social contingencies (241, 242).

In the ecosocial view, humans are embedded in and dependent on culturally constructed environments that include physical arrangements as well as a web of relationships with other people and social institutions. The 4E perspective insists that interactions with the environment are part of the dynamics that constitute the individual. In human ecology, however, the distinctions between individual and environment are phenomenologically, psychologically, morally and politically important. Hence, drawing the boundary between 'inside' and 'outside' (organism and environment or system and subsystem) varies with the clinical question and the way we locate the relevant dynamics (243). There can be principled and practical reasons for drawing a boundary in a particular way both because it highlights crucial dynamics and constitutes a useful way to organize case formulation and guide intervention. These reasons may include the system's topology, the feasibility of specific interventions, and the ethical imperative to privilege the patient's perspective (244).

Integrating the patient's self-understanding

A key element in an ecosocial systemic approach is recognizing the role that the person's own understanding of and response to symptoms and suffering play in the dynamics of mental disorders, coping, help-seeking, treatment response and recovery. In the case vignette presented in the previous section,the patient's self-diagnosis and explanatory model of her symptoms follow closely from the prevailing brain-centric model of depression widely disseminated in popular culture. This model portrays depression as a condition related to specific neurotransmitters and explains the efficacy of medications by their effects on corresponding receptor sites. More recent versions of this explanatory model go beyond synaptic mechanisms to consider brain circuitry (245–247). Other patients may present explanations that draw from sociomoral or religious understandings of suffering and view illness as a consequence of moral transgression or failing (248). These modes of explanation and attributions influence ways of coping and help-seeking but they may also participate in the vicious circles that aggravate dysphoria, self-deprecation, social withdrawal, and other symptoms of depression (249).

The patient's illness narrative, which emerges in dialogue with available cultural models and in clinical encounters, also shapes the process of meaning-making and illness experience (238). The models used by clinicians — which borrow from both technical literature and dominant cultural narratives — also shape patients' experience and expectations (173). In this case vignette, the patient adopted a simple biological model of depression even before speaking to the doctor, setting aside her challenges of job loss and relationship problems as secondary issues. In so doing, she focused her expectations in consulting the clinician on receiving a specific medication. While this fits squarely with psychiatrists' competence, it may require negotiation, because her self-diagnosis may not be accurate and her requested treatment may not be appropriate, and, even if it does address an important facet of her current problem, medication may not be sufficient to resolve other aspects of her predicament (250, 251).

The effects of adopting a neurobiological explanation go beyond a narrow focus for clinical assessment and treatment to also influence the patient's sense of self-efficacy and participation in the process of recovery as well as broader features of her identity. A simplified, brain-centric model of depression makes antidepressant prescription seem a straightforward, necessary, and sufficient clinical response. Of course, beyond pharmacogenetics, kinetics, and dynamics, our mechanistic knowledge of drug action remains limited (252). Antidepressant treatment may have different effectiveness based on the individuals' expectation of efficacy (253) or their socioeconomic status (254), requiring the clinician to consider the interaction of the type of treatment and the patient's context when collaboratively designing a care plan (255). Moreover, prescription is inevitably a social and symbolic act, and taking medication has meaning and consequences for psychological self-regulation and social identity (256, 257). Rose (258) has drawn attention to the ways that biomedical diagnosis and treatment of mental disorders lead to narratives of "neurochemical selves" with consequences for individual coping as well as for mental health policy and practice. There is increasing recognition that good practice in psychopharmacology requires paying attention to the personal and cultural meanings of medication and patients' own values and priorities (259). A cultural-ecosocial view can inform existing approaches to shared decision making and collaborative prescribing or deprescribing of medication (255).

An ecosocial systems approach to person-centered clinical practice

Psychiatric practice employs multiple ways of knowing that have been characterized as *verstehen* (understanding), *erklären* (explaining) and *einfühlung* (empathic, embodied co-presence/being/knowing) (260). These ways of knowing have different epistemic bases and constraints and are sometimes in tension, conflict or competition. In contemporary psychiatry, this tension is seen between the divergent approaches of precision psychiatry (which characterizes the person in terms of biological parameters) and person-centered psychiatry (which emphasizes experience, values and context) (261, 262). Although advocates of each approach superficially acknowledge the other, in practice their respective research programs and modes of implementation reflect the persistence of an underlying dualistic ontology (129, 218). Bringing *erklären*, *verstehen*, and *einfühlung* together in clinical formulation means integrating explanatory models and mechanisms across levels, including molecular, physiological, neural circuitry, cognitive, and social. Including the social level requires knowledge of social and cultural history and current context as well as biographical trajectories. Because our institutions and practices are embedded in these same contexts, a social-cultural perspective requires self-reflective consideration of the clinician's positionality and interaction with the patient and others in the co-construction of clinical narratives (260). The cultural-ecosocial systems approach offers a frame that can encompass these dimensions of psychiatric practice through a dialogical process of meaning-making that recognizes culture and context.

Human ecological niches are fundamentally *social*—with socially constructed contexts and relationship providing the essential matrix of development from inception—and *cultural*, with shared meanings, values and practices shaping cognition and experience across the lifespan. The notion of ecosystem builds on work in ecological systems theory in developmental psychology (68), which emphasizes the embedding of the individual in multiple, nested environmental contexts, defined by socio-relational and spatio-temporal scale and composition to include: *micro* (immediate family and friends, community and work-school setting); *meso* or *exo* (neighborhoods, wider networks, and larger community); and *macro* (society, nation, transnational) contexts. (See: Table 1), The idea of a niche highlights the interactive and dynamic nature of such sociocultural embedding. Social context, structural, economic and political forces affect individuals and groups differentially as a result of individual and collective past histories, biology, and current positionality (263).

To unpack the notion of niche in a way that can serve a person-centered clinical approach, the ecosocial systems view needs to consider the intersections and interactions across at least four overlapping domains: (1) lifespan developmental history; (2) social structure and positioning; (3) cultural meaning, norms, values and affordances; and (4) individual biography and self-understanding (which draws selectively from each of the other domains). These domains can provide a temporal dimension to clinical formulation that points both to adaptive challenges and resources for helping, healing and recovery. Efforts to develop models that incorporate social context and lived experience are underway, but they face multiple obstacles, including lack of collection of data representative of population variability and high levels of context dependence as well as ethical and pragmatic issues related to the use of such data (264). We need better conceptual, research and clinical tools to characterize niches—their demands, affordances, and constraints as well as their embedding in larger ecosystems (6). The theory of syndemics provides one approach to exploring the multilevel interactions that give rise to mental health problems (265, 266).

While the notion of niche points to the immediate environment that an individual inhabits, in reality, human niches are subsystems of larger social systems. An ecological view encourages us to examine this larger network of relationships and how they interface with local niches. It is a virtue of the ecological perspective that it allows us to think systematically about the relationships between our most proximal and intimate relational networks and the larger networks with which we are coupled. The nature of this coupling depends on local arrangements and interpersonal interactions, which are extended by population migration as well as information and communication technologies that allow connections with distant others but that also create virtual environments that we increasingly inhabit (267, 268).

In the current moment, relationships on the planetary scale are increasingly present and consequential in the lives of individuals through the impacts of climate change (269, 270). These interactions occur in material ways, but they are also present in self concepts, imagination and orientation toward the future with significant mental health impacts. True to its name, an ecosocial view, encourages us to think about mental health as dependent on these wider networks and modes of interdependence. Coming to terms with the impact of our changing environments requires considering not only strategies for individual adaptation, but the larger, social structural arrangements that account for global disparities and that constrain the options of individuals and groups across the globe (271, 272). Ultimately, mental health theory and practice must consider not only the private challenges of individuals, but the larger dilemmas faced by our species and the planet we share with others (273).

Conclusion

Although psychiatry conventionally locates mental health problems in the individual, systems thinking encourages to see the ways in which health and the wide range of problems seen in clinical settings arise from interactions at multiple levels from the biological to the cognitive and social. Recognizing patients' agency and restoring their health requires that clinical care consider the range of systemic processes that contribute to suffering and impairment (274). Addressing problems that derive from social structure may require interventions that go beyond individual clinical care to include advocacy and social-network interventions. Advocacy is not limited to efforts to change policy and institutional practices but includes actions that aim to counter oppressive circumstances and create habitable environments and niches for individuals (275).

Efforts to provide multilevel systems explanations of health problems are often challenged as "too complex" for practical application. Systems dynamics may be difficult to think through and require specific training to apply. Complex systems can exhibit counterintuitive properties, but qualitative understanding is often sufficient to guide practice (276–279). Quantitative models of specific problems could allow clinicians to examine the effects of potential interventions on system dynamics to guide treatment and predict outcomes. Crucially, these models can include clinician-patient interaction and other social processes as part of the symptom network. Innovative computational methods can capture multilevel system dynamics if the relevant data are collected (264). The resultant models could be used as decision tools or used by clinicians and patients to foster mutual understanding and motivate interventions. The models we offer to patients are themselves interventions that may guide self-reflection and elicit new behaviors. They may also function as self-fulfilling explanations that foreclose the search for better answers. How this plays out depends on the ability of the clinician to apply dynamical systems models while closely attending to the patient's experience so that the model can be refined and care remains patient-centered.

The application of dynamical systems models in psychiatry, though actively pursued for decades, has been slow to advance and has had limited uptake. There are several likely reasons for this, including that the adoption of systems thinking has been hampered by (i) continued investment in reductionist models because they are amenable to study by common scientific methodologies; (ii) the limitations of clinical decision making, which make it hard to incorporate complexity and interaction effects; and (iii) economic and political interests that favor short-term treatment and pharmacological interventions rather than approaches that challenge entrenched systems. However, new computational modelling methods that can be implemented in clinical settings to support patient education and real-time decision making offer the hope of significant progress.

The challenges associated with complexity reflect the real-world dynamics of human problems (280, 281). Recognizing this complexity should urge on us humility and the need to frequently recalibrate our clinical response to respond to patients' experience. It underscores the need for idiographic methods of case formulation, which may include characterizing networks of relationships among symptoms and related biological, cognitive, and social processes (194, 282). Finally, it points to the importance of self-reflexivity, in which clinicians interrogate their own assumptions and practices to rethink case formulations and potential interventions.

The cultural-ecosocial view includes practitioners, clinical settings, health care systems and the local and international institutions of psychiatry itself — both as material and discursive practices— as part of the systems in which patients and practitioners are embedded and which offer them affordances, norms and constraints. These need to be factored into practice in general and into the formulation of specific cases. A literature in critical psychiatry has considered some of the ways in which psychiatry colludes with larger structures of oppression (201, 283). This is more likely to occur when psychiatric practice is narrowly conceived as the identification and treatment of discrete disorders without attention to patients' lived experience, values, and lifeworlds as well as to practitioners' tacit assumptions. By giving an explicit place to the meaning-making process in clinical encounters as well as in institutional and wider social contexts, a cultural-ecological systems view opens the door to more self-reflective and critical thinking that can uncover power dynamics and counter potentially oppressive practices.

An ecosocial systems view offers a way for clinicians to organize the multiple explanatory models needed to capture the complexity and heterogeneity of psychiatric disorders and illness experience. Based on a view of psychiatric disorders as involving complex system dynamics, an ecosocial systems approach allows clinicians to use multiple languages of description to assess processes within and across levels of organization of an overarching ecology of mind and to prioritize those that offer the greatest therapeutic leverage and optimal use of resources for person-centered practice.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

AG-C and LK contributed equally to conceptualizing the manuscript. AG-C wrote the first draft. LK wrote sections of the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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Is the mainstream construction of mood disorders resistant to systemic thinking?

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Introduction: In this study we explore how the diagnostic category of mood disorders is constructed in two handbooks of Psychopathology as an example of the mainstream construction of psychopathology. Despite the increasing criticism and lack of evidence, the debunked chemical imbalance theory of the etiology of depression still dominates the professional and pop/folk understanding and interventions.

Methods: We analysed the breadth of the inference field and the type of etiopathogenetic contents of the explanations of mood disorders using the "1to3" Coding System.

Results: Our findings show that the dominant explanations draw almost exclusively onto monadic explanations, followed by limited dyadic ones. Intrapersonal etiopathogenetic contents prevailed, and biomedical explanations were dominant in both textbooks.

Discussion: We critically discuss the underpinnings of these results and address the clinical implications of these biased representations, as well as potential alternative approaches to psychopathology.

KEYWORDS

causal explanations, systemic explanations, psychopathology, etiology, mood disorders, major depression disorder (MDD), relational, biomedical

Introduction

Beyond the bio-bio-bio: from "neurochemical to inter-dependent selves"

Stemming from a critical and socio-constructionist epistemology, this paper critically explores the current dominant constructions of psychopathology through the analysis of the definitions of mood disorders and their etiological explanations, which are put forward in a selection of mainstream psychiatric textbooks. We conclude by pointing towards an alternative approach.

Founded as a discipline by Karl Jaspers, psychopathology is the scientific study of mental disorders, which should envisage not only the nosological description or categorization of symptoms and syndromes, but also the development of *meaning-ful* etiopathogenetic accounts.

Over the last 2 centuries though, it has progressively lost its original mission and interest for meaning (re-)making, hermeneutics and phenomenology, to confine itself within the absolute domain of nosographic psychiatry in the attempt to secure itself the same reputation of other branches of medicine. Mesmerised by the hyper-biologistic assumptions that were bringing high expectations and then largely debunked, psychiatry ended up bracketing all the other possible explanations and clinical theories and ultimately, therapeutic approaches. This

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bio-medical model aiming solely at nosographic classification and at postulating pathophysiological causes of mental disorders put forward explanatory models based on monadic inference, determinism and linear causality and, ultimately, to hermeneutic closure (1).

Nevertheless, during the last century, different critical psychiatry and therapeutic approaches, and especially systemic theories, attempted to resist this soaring trend and breached the shallow limits of nosographic psychiatry, bringing back psychopathology to its very core: emotions and meaning [e.g., (2–4)]. These attempts go beyond the *theoretical* recognition of the role of relational, social and contextual aspects in the development of mental disorders, thus extending etiopathological models beyond the monad; however, these factors are still largely neglected in mainstream clinical practice and thinking.

Moreover, psychopathology and related terms (e.g., *psychiatric disorder, emotional distress,* and *mental illness*) are often used as interchangeable, disregarding the very different ontological and epistemological underpinnings of these constructs.

Within our constructionist, complex and critical perspective, we consider psychopathology not as an "objective" scientific term, but rather as a cultural, political and social *construction* (5–7), largely or entirely determined by different ontologies and epistemologies, as well as societal, cultural and professional values, biases and allegiances. As maintained by McNamee and Gergen (8): "The mental health profession is not politically, morally, or valuationally neutral. Their practices typically operate to sustain certain values, political arrangements, and hierarchies of privilege" (p. 2).

Addressing psychopathology from this perspective is pivotal, so that what is categorised as "disorder" can be understood and located as by-product of particular historical, professional and socio-cultural constructions tied to financial and lobby interests, rather than a reification, i.e., acritically assumed as objective descriptions of universal and stable categories of human experience stripped of their contextual determinants.

Within this epistemological framework, all phenomena are socially constructed and are therefore also contingent and open to change (deconstruction) rather than being static and chronic. For instance, the meaning of "depression" is always determined by the socio-political, historical, and cultural context within which it is constituted, as well as by its relational dynamics (9–11). This motivates us to study both collective and individual processes of meaning-making in mental health, including the corresponding academic, mediatic and industry discourses within which these processes take place.

As Galbusera and Fellin (12) previously argued, the dominant third-person approach (TPA) of mainstream psychopathology research and practice is mostly based on descriptive diagnostic categorizations such as those regulated by the Diagnostic and Statistical Manual of Mental Disorders (13). As well known, since its third edition the DSM claims a position of a-theoreticity, but it actually relies on an epistemology of logical empiricism and on physicalist ontology. Therefore mainstream research and practice in psychopathology reflect the very same bias. The TPA constructs symptoms in a "game of semantics" that Timimi (14) exposes like this:

> Symptoms become much more than descriptive constructions: they are reified providing the illusion that the disorder itself exists as a natural object. This easily leads to etiological theories that link mental distress to supposed biochemical or genetic causes (and therefore, mostly pharmaceutical interventions). In this approach to diagnosis, individuals are equated to their diagnostic label and therefore stigmatized or even alienated and dehumanized. (p. 116)

The awareness that individuals are always to be conceived within the complex systems in which they are embedded originally stems from the clinical field of systemic therapy. From this interdisciplinary perspective it is nowadays broadly recognized that the human psyche—and thus its *dis*-orders—cannot be conceived as being disconnected from its body and from the systemic intertwined loops within its environment. Although mainstream psychopathology is in principle based on bio-psycho-social assumptions, the psycho-*social* aspects are actually neglected when it comes to conceptualising and treating "mental" disorders (15).

Indeed, also in response to the strong opposition of critical psychiatry in 1950–1960, the introduction of the bio-psycho-social approach in the '70s was supposed to bring forward the complex interplay of social, biological and psychological factors. Yet this has remained only a theoretical basis for understanding and explaining mental disorders, not reflected in mainstream clinical practice and training, that progressively collapsed into solely drug prescriptions consistent with what Schultz labels *neuroessentialism* (16). Back in 2005, Dr. Steven Sharfstein (17), then President of the American Psychiatric Association, already admitted that:

> "If we are seen as mere pill pushers and employees of the pharmaceutical industry, our credibility as a profession is compromised. As we address these Big Pharma issues, we must examine the fact that as a profession, we have allowed the bio-psycho-social model to become the bio-bio-bio model."

Constructions and de-constructions of psychopathology

For decades, the dominant "biomedical model" approach has been promoted by various forces, the strongest being insurance companies, biological psychiatry and its financial ties with drug companies (18, 19). Amongst its numerous critics (1, 9, 20–28), there are now several prominent APA psychiatrists and former heads of DSM task forces (29).

Even the former Director of the U.S. National Institute of Mental Health (NIMH), Insel (30) in *Healing: Our Path from Mental Illness to Mental Health* blatantly acknowledged that compelling research forced psychiatry to discard the "chemical imbalance theory" of mental illness. But Insel has swiftly jumped on the new psychiatry's bandwagon: the "circuitry defect" theory of mental illness. In this ultimate attempt to absolve psychiatry, Pies (31) even tried to dismiss the 'chemical imbalance' as an "urban legend" of mental illness (32–34); indeed the Emperor's new clothes is the new (unsupported) rebranding of mental illnesses as 'connectional' or 'brain circuit disorders'.

According to critics like Levine (35) and Gøtzsche (36), Insel (30) has made crystal clear: (1) psychiatry's worsening treatment outcomes; (2) psychiatry's jettisoning of its chemical imbalance theory of mental illness; and (3) the scientific invalidity of the DSM ("The DSM had created a common language, but much of that language has not been validated by science"). The DSM has been widely criticized for various

reasons, not least because the number of official mental disorders recognized by the American Psychiatric Association has increased from six in the mid-19th century to close to 300 in the DSM-5 (37). Between 1952 and 2013, the number of pages in the DSM increased from 130 (mostly appendices) to over 900. At the same time, as abovementioned, nosographic manuals have progressively obliterated any explicit aetiological hypotheses or factors from their criteria. Current manuals claim to hold an atheoretical and "agnostic" approach to etiology and to maintain a descriptive approach to classification of mental disorders. But all the above-mentioned authors have highlighted how this is misleading and how current diagnostic categorizations indeed imply a bio-medical etiology, starting from the very definition of disorders.

However, neither Insel nor Pies acknowledge the underlying inconvenient truth, i.e., the possibility that the bio-psychiatry's medical model that constructs human beings as "bio-chemically-electrically defective in need of bio-chemical-electrical treatments is a failed paradigm" (36).

Nevertheless, the momentum for a fundamental shift in mental health that many critical authors have advocated for long might, finally, approach, also thanks to very high profile endorsements. Dr. Pūras, UN Special Rapporteur (38) and Lithuanian psychiatrist, called for a drastic move away from drug-company-supported biological explanations of *human distress*. In 2019, Pūras argued:

> "Current mental health policies have been affected to a large extent by the asymmetry of power and biases because of the dominance of the biomedical model and biomedical interventions. This model has led not only to the overuse of coercion in case of psychosocial, intellectual and cognitive disabilities, but also to the medicalization of normal reactions to life's many pressures, including moderate forms of social anxiety, sadness, shyness, truancy and antisocial behaviour."

The World Health Organization (39) echoed this call in a paper entitled "Guidance on Community Mental Health Services: Promoting Person-Centred and Rights-Based Approaches," critiquing the overly biological approach in mental health and calling for fundamental changes, or even a revolution. Both these groundbreaking reports pivoted the etiological emphasis to the social determinants and structural inequalities of mental health, such as violence, discrimination, poverty, exclusion, isolation, and unemployment.

The WHO's report (40) states:

> "The predominant focus of care in many contexts continues to be on diagnosis, medication and symptom reduction. Critical social determinants that impact on people's mental health such as violence, discrimination, poverty, exclusion, isolation, job insecurity or unemployment, lack of access to housing, social safety nets, and health services, are often overlooked or excluded from mental health concepts and practice. This leads to an over-diagnosis of human distress and over-reliance on psychotropic drugs to the detriment of psychosocial interventions."

> "A fundamental shift within the mental health field is required, in order to end this current situation. This means rethinking policies, laws, systems, services and practices across the different sectors which negatively affect people with mental health conditions and psychosocial disabilities, ensuring that human rights underpin all actions in the field of mental health. In the mental health service context specifically, this means a move towards more balanced, person-centered, holistic, and recovery-oriented practices that consider people in the context of their whole lives, respecting their will and preferences in treatment, implementing alternatives to coercion, and promoting people's right to participation and community inclusion."

Beeker et al. (20) put forward a two-way conceptual model of this growing psychiatrization of society, distinguishing between top-down and bottom-up agents and processes. Among the top-down forces we would encompass also the curricula training of new mental health professional, in particular that of physicians, as psychiatrists and GPs are the main "pill pushers" and the strongest direct influencers of patients' biological explanations of their distress, together with direct-to-consumer ("DTC") pharmaceutical advertising (1, 41). Beeker et al. (20) also call for interdisciplinary research investigating causes, mechanisms, and effects of psychiatrization, to which we aim to contribute with this paper.

Several critical studies have explored how different versions of mental health are constructed in different contexts and the effects of various variables on these (9, 42, 43). It is important to keep in mind that although dominant stereotypes about mental health exert a powerful role (e.g., when defining what it means to be healthy or ill), different individuals and groups, in various contexts, may construct a variety of different disorders in constantly changing feedback loops (1, 20).

Another contribution comes from Davis' (1) interview study which found that doctors were the primary source of influence that make lay people keener to embrace the biological explanations of emotional distress, disregarding other factors that were previously considered more relevant, and which orient them towards more pharmacological solutions rather than psychotherapy, consistently with Watson and Beshai's findings (44). Citing an older US study by Jones, Kahn, and Macdonald (45), Davis (1) illustrates also how these lay people attributions have shifted from 1970s onwards: patients shifted from relational explanations towards bio-glitch and quick fix attitudes. These findings are also consistent with other research targeting populations not directly influenced by physicians or DTC ads (46, 47). O'Neill, Stapley, Stock, Merrick and Humphrey's (48) study found that UK adolescents resorted mostly to interpersonal and contextual factors to explain their emotional distress.

Ugazio and colleagues (49) found that clients in private (systemic) psychotherapy with psychologists resorted mostly to interpersonal explanations rather than biomedical ones. Other research conducted with Italian lay populations (50, 51) found that mental disorders (including depression) are mostly seen as a reaction to significant current life events and psycho-social stressors and that should be overcome with the help of health professionals (mainly psychologists) and/or support of significant others. This is consistent with findings from other countries [see (50)]. Magliano et al. (46) also explored how Italian psychology students' constructions of 2 disorders changed during their 5-year academic training. Interestingly, first year students more frequently mentioned psychosocial factors among the causes of depression and believed more in the usefulness of psychotherapy and less about drugs; they also had more prognostic optimism; at the end of their education,

students cited heredity as a cause more than at first year. This finding confirms the increasing relevance assigned to biogenetic factors at disadvantage of a more balanced biopsychosocial model and therapeutic approach to this disorder.

We can hence argue that current curricula taught to mental health professionals reflect these mainstream theoretical underpinnings, and hence educate future mental health professionals to practice according to this dominant construction of disorders, especially for those diagnostic categories associated with important incomes for "Big Pharma" and growing sectors of possible life-long consumers (6, 7, 52). In the last decades, psychiatrists almost stopped undertaking psychotherapy training (53) and Tadmon and Olfson (54) highlight that more than half of psychiatrists in a US nationally representative survey claimed they do not provide psychotherapy of any kind. Moreover, the percentage of psychiatrist visits involving psychotherapy dropped more than 50% between 1996 and 2016 and patients from minority groups and/or facing socioeconomic disadvantages have the lowest likelihood of receiving psychotherapy from their psychiatrists.

Moran (55), a founding member of the APA Caucus on Psychotherapy, pointed out that the disparity revealed by Tadmon and Olfson (54) uncovers a wider public health crisis, mostly driven by an insurance industry that disincentivizes treatment aimed at recovery by the most highly trained practitioners and instead has been focused on "mere crisis stabilization." He noted that this includes psychotherapy in general and its provision by psychiatrists, now in a "professional identity crisis."

The growing research field of critical mental health studies is hence also relevant when it comes to understanding assumptions among mental health professionals and how these inform and shape lay people's and patients' ones. We shall take the paradigmatic example of mood disorder to illustrate this dominating and problematic trend.

De-constructing mood disorders

According to the World Health Organization (56), depression is a common mental disorder. Globally, more than 280 million people of all ages suffer from, or better, are *diagnosed* with depression (56).

Despite depression being known since ancient times, up to 40 years ago it was a rare psychopathology; however, the incidence of depression globally rose from 172 million in 1990 to 258 million in 2017, indicating a growth of 49.86% (57). Despite this trend can reflect the growth of the population (58), some authors question whether this is a case of disease mongering (59) and over diagnosis.

Depression is also a leading cause of disability worldwide and is a major contributor to the overall global burden of disease. While the burden on health-care systems and societies is allegedly still underestimated and projected to grow constantly, the current bio-psychiatrization is also adding to this economic burden (20).

The idea that depression is caused by a brain chemical imbalance (i.e., lowered serotonin) has been described at the same time as the "dominant cultural story of depression etiology" [(33), p. 411] and as an "urban legend" (31, 60). Beyond this lack of evidence, the WHO website warns that:

> Barriers to effective care include a lack of resources, lack of trained health-care providers and social stigma associated with mental disorders. Another barrier to effective care is inaccurate assessment. In countries of all income levels, people who are depressed are often not correctly diagnosed, and others who do not have the disorder are too often misdiagnosed and prescribed antidepressants.

More recently, the World Health Organization's (61) Mental Health Gap Action Programme (mhGAP) guideline for mental, neurological and substance use disorders has established that antidepressant (including SSRI) are not the first line treatment for depression and should only be prescribed when psychological interventions are not available and put an emphasis on assessment of psycho-social stressors.

However, the dominant narrative is still entrenched in professional, mediatic and pop discourses, as it has altered the way people think about their moods in terms of brain chemicals and, by extension, their very concept of themselves as 'neurochemical selves,' with profound implications for their sense of agency and self-efficacy (62), as well as possibility of recovery and the relevance of socio-relational factors and possible aids.

As already mentioned, several leading psychiatrists have been claiming that the chemical imbalance theory is an 'urban legend' that was never 'seriously propounded by well-informed psychiatrists' as the aetiological cause of depression (31, 60).

In this paper, we explore how this theory is still influential through academic textbooks, although officially conveniently dismissed as an "urban legend" for well over a decade now.

Ang et al. (32) have analysed different sources of the serotonin theory of depression to challenge Pies' defense of the 'urban legend'. Their exploration of the status quo in the scientific literature includes also psychiatry and psychopharmacology textbooks published between 1990 and 2012 in the United Kingdom and United States. All the textbooks reviewed by the Authors acknowledged that the serotonin hypothesis is not necessarily proven, and some stressed the provisional nature of research findings on the biological basis of depression. All the textbooks dedicated substantial space to the discussion of serotoninergic factors and ultimately supported the theory. However, Ang et al. (32) did not analyse in depth the different types of explanations provided in these books nor how much emphasis is given to the psycho-social and systemic-relational factors. Indeed, handbooks are very influential for mental health professionals in training as they are considered an established and prestigious source of references that informs their education and future work. They are regarded as the synthesis of the up-to-date evidence base and state of the art in the field and most likely they will also direct future training orientations for professionals and treatment indications for clients.

The breadth of the inference field in mainstream psychopathological accounts has not been an object of scientific inquiry yet. With this study we seek to assess the extent to which mainstream psychopathology reflects the current scientific standard of embodied, extended, enacted and embedded approaches to the human mind, which are based on systemic and complex thinking (63, 64).

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Materials and methods

Our study aims at exploring this overarching question: are handbooks of psychopathology up to date with a systemic and relational epistemology?

Or are they still imbued with the predominant bio-bio-bio model?

To answer these questions, this study analyses the breadth of the inference field of psychological symptoms explanations in two mainstream psychopathology manuals. We take the DSM-5, one of the two main diagnostic classification systems, as representing the current mainstream approach. Yet, since the classification system is *per se* conceived as being merely descriptive, we focus on two psychopathology manuals, reflecting the DSM nosology with etiopathogenetic accounts.

We took into consideration as a case study one of the most controversial diagnostic categories of psychopathology (33, 63): the mood disorders, which are at the very core of the heated debate discussed above.

The main research questions for this study are of exploratory nature:

1 What breadth of the inference field prevails in psychopathological accounts of mood disorders in these textbooks?
2 What kind of etiological contents (factors/causes) feature in psychopathological accounts of mood disorders in these textbooks?

To answer these questions, this study considered all the explanations related to mood disorders put forward in two mainstream psychopathology academic manuals (64, 67). In this sense, each text can be studied in relation to both the professional discursive practice, in which the texts are produced and/or consumed, and the surrounding wider sociocultural context, which also contributes to the meaning of any given text.

Both texts are professional manuals on psychopathology that claim to offer guidelines for students, educators, and practitioners. They were chosen for analysis as texts that can be perceived as trustworthy, given their publication by leading publishers such as Guilford Press and the American Psychological Association. Furthermore, both texts are recommended on the APA website, a leading and influential institution worldwide.

Content analysis

As applied in this study, we see each articulation about mood disorders and related interventions as text, and the academic psychiatric culture as the discursive practice—in other words, the immediate context within which these meaning-making processes take place. It is more difficult to account for the wider sociocultural practice or political context, because it potentially encompasses "everything" and would require a different research approach. In this analysis, however, we have focused on a limited number of categories that prove relevant with regards to defining what it means to be "depressed," why and how a person diagnosed with depression should get treated.

We focused on the three following categories of explanations:

1 Symptom explanations
Example: "Together these studies provide strong evidence that rumination in the context of either naturally occurring or experimentally induced depressed mood maintains dysphoria, enhances negative thinking, and impairs problem solving" [(67), p. 34].
2 Therapeutic change explanations
Example: "Patients with bipolar forms of mood disorder can respond well to the antidepressant medications, especially when they are in the depressed phase of the disorder" [(64), p. 42].
3 Etiology explanations
Example: "Neurotic depressions belonged to a larger category of nervous disorders, which were thought to stem from abnormalities of the nerves, fibers, and organs" ((64), p. 31).

We analysed the breadth of the inference field of the explanations using the "1 to 3" Coding System (68). This coding system allows distinguishing between monadic, dyadic (unidirectional or bidirectional) and triadic (triadic or systemic) explanatory models. This has been complemented by the additional categories included by Ugazio et al. (49) to analyse the type of contents/causes of the explanations [amended from Schweizer et al. (69)].

We put forward the following hypotheses: that both texts utilize more monadic and dyadic explanations than triadic explanations (H1); and that intrapersonal (H2) and biomedical explanations (H3) prevail in both texts.

Coding procedure

The coding and classifying system "1 to 3: from the monad to the triad" (68) was applied to the chapters.

The detected explanations are classified according to the inference field, using five categories, and operationalized as follows. The examples provided come from the present data corpus.

1 *Monadic*. The explanation is sought within the individual.
Example: "Indeed, neuroticism has been found in several studies to predict the development of depressive episodes" [(64), p. 26].
2 *Unidirectional dyadic*. The explanation involves two characters, only one of which has an active influence on the other.
Example: "Depression is viewed as resulting from a continued reliance on emotional schemes that had been formed earlier in one's life." [(64), p. 48].
3 *Bidirectional dyadic*. The explanation entails two characters, both of them are actively involved.
Example: "Depression is indeed associated with <…> couples' difficulty with solving problems, and less satisfaction (and dissolution) in a romantic or marital relationship" [(67), p. 41].
4 *Triadic*. The explanation involves three or more characters but only partially links them.
Example: "Insecure parent–child attachment and parental conflicts have also been identified as early predictors of depression" [(67), p. 40].
5 *"Systemic" triadic*. The explanation involves three or more actors, linking them in a circular gestalt.
Example: "FFT's superiority over crisis management in the reduction of depressive symptoms was partially mediated by

its effect on positive nonverbal interactions by family members" [(64), p. 50].

The content (causes) of each explanation was coded in five categories, three of which corresponded with those used by Schweizer et al. (69).

1 *Traumas and external events.* Mood disorders are attributed to events, which the client considers traumatic or constructs as external. Such events could also be positive, nonetheless, clients believe they have no control over them.
Example: "Other events, such as occupational failure or job loss (sometimes called agentic stressors), have also been associated with depression from both theoretical and empirical sources" [(67), p. 41].
2 *Biomedical explanations.* Mood disorders are attributed to genetic or hereditary factors, to organic diseases, or to physiological dysfunctions of the client.
Example: "In contrast, studies conducted in the afternoon found elevated cortisol levels in depressed individuals" [(67), p. 36].
3 *Personality traits.* Mood disorders are attributed to stable personality traits.
Example: "The personality dimensions most germane to mood disorders are neuroticism and extraversion" [(64), p. 37].
4 *Intrapsychic conflicts.* Mood disorders are attributed to dilemmas or conflicts within the person.
Example: "Beck's model posits that depression is characterized by unrealistically negative views of one's self, world, and future" [(64), p. 43].
5 *Interpersonal conflicts.* Mood disorders are attributed to interpersonal conflicts or difficulties.
Example: "A substantial number of interpersonal factors have been associated with the onset, maintenance, and/or recurrence of depression across different phases of life" [(67), p. 40].

The first coder (EZ) identified and coded all explanations ($N = 356$) provided on mood disorders in both books (64, 67).

The second coder detected 73.1% ($n = 88$) of inference fields explanations and 50% ($n = 61$) of content explanations in the chapter Depression (67). For the inference fields, the inter-rater agreement is $\kappa = 0.55$, $p < 0.0005$, while for the content explanations Cohen's kappa is higher ($\kappa = 0.88$, $p < 0.0005$).

The third coder analysed the chapter Mood disorders (64) identifying 19.4% ($n = 45$) of inference fields explanations and 19% ($n = 44$) of content explanations. The inter-rater agreement is from moderate, according to Altman (70) for the content explanations ($\kappa = 0.51$, $p < 0.0005$) to good for the inference fields ($\kappa = 0.8$, $p < 0.0005$).

Data analysis

The first coder identified 356 explanations, on average 178 per chapter/text (range: 132–232). The data were analyzed by calculating the frequencies of units within the coding categories and by comparing differences between the two textbooks. The study design includes the following variables: inference field and content. In order to obtain an adequate frequency in each cell, the inference field variable was collapsed into its three main levels: monadic, dyadic, and triadic. Also, the content variable was clustered in three main categories: external causes (trauma and external events), intrapersonal characteristics (biomedical explanations, personality traits, intrapsychic conflicts), and interpersonal dilemma and conflicts.

Natural language processing

To gain deeper insights into the content and visualize its predominant language patterns related to symptoms explanations, we adopted an alternative to human coding procedure and employed natural language processing (NLP) techniques using R (Version 2022.12.0 + 353) on the selected chapters (64, 67). Bi-grams (frequency > 4) were specifically selected due to their enhanced informativeness in capturing meaningful message associations compared to individual words (unigrams) (70).

For the purpose of our analyses, which focused on comprehending the overall trends within the two chapters, we combined them in this phase of the investigation. The objective behind employing NLP filtering techniques was not only to eliminate noise (72), but also to exclude irrelevant content, such as pairs of words that did not contribute to explanations of etiopathology, symptoms or therapeutic change (for example, words as "depression," "disorder," "patient" etc.).

Results

Examining the breadth of the inference field

With two expected cell counts less than five, Fisher's exact test (2 × c) showed that there was no statistically significant difference between books in the distribution of explanations of symptoms and etiology between three levels (Figure 1), $p = 0.84$. The chi-square goodness-of-fit test indicated that levels of explanations were not equally distributed and handbooks resorted almost exclusively to monadic, with some presence of dyadic explanations ($\chi^2(2) = 195.57$, $p < 0.0005$).

However, according to the results of Fisher's exact test, there was a significant variation in the levels of inference between the book chapters (Figure 2) when it came to explaining therapeutic change ($p < 0.0005$). *Post hoc* analysis involving pairwise comparisons using multiple Fisher's exact tests (2 × 2) with a Bonferroni correction showed that the difference was related to higher prevalence of monadic explanations and less dyadic explanations in the chapter "Mood disorders" (64), $p < 0.000005$.

The chi-square goodness-of-fit test indicated that levels of explanations of therapeutic change were not equally distributed ($\chi^2(2) = 140.97$, $p < 0.0005$).

Comparative analysis of explanations across handbooks

There was no difference in explanations of etiology and symptoms between book chapters, as shown by a chi-square test of homogeneity ($p = 0.596$).

The chi-square goodness-of-fit test unveiled a statistically significant imbalance in the distribution of etiopathogenetic explanations across categories in both textbooks ($p < 0.005$). Intrapersonal explanations prevail, as depicted in Figure 3, confirming our hypothesis (H2).

To check if biomedical explanations (H3) dominate in both texts, the content variable was clustered in four main categories: external causes (trauma and external events), biomedical causes (intrapersonal biomedical explanations), personal attributes (personality traits,

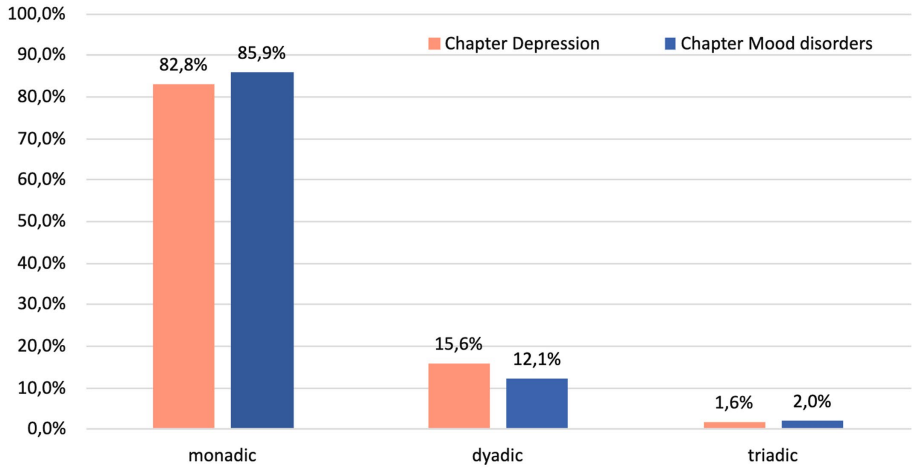

FIGURE 1
Percentage of monadic, dyadic, and triadic explanations of etiology and symptoms of mood disorders in two textbook chapters ($N = 163$).

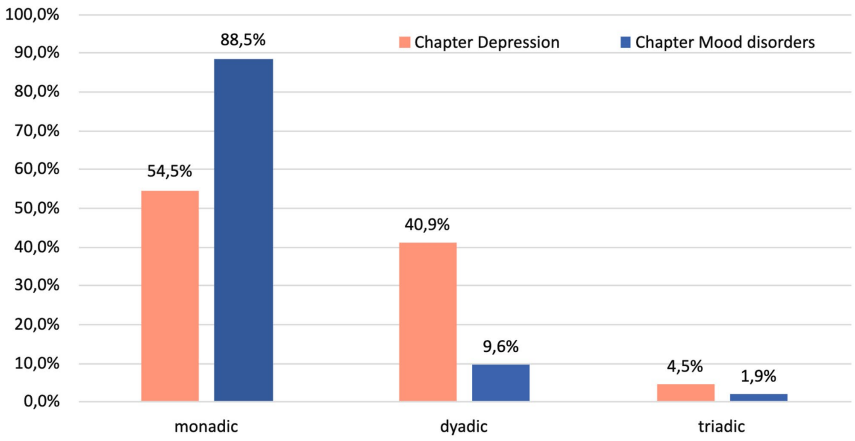

FIGURE 2
Percentage of monadic, dyadic, and triadic explanations of therapeutic change for mood disorders in the two textbooks ($N = 148$).

intrapsychic conflicts), and interpersonal dilemma and conflicts, so that intrapersonal characteristics were divided into two subtypes, bio and not-bio. A chi-square test of homogeneity did not find a statistically significant difference between the texts ($p = 0.617$), so we analyzed them as a whole.

Chi-square goodness-of-fit test confirmed unequal distribution of etiopathogenetic explanations in the corpus, $p < 0.005$. The main etiopathogenetic explanations for etiology and symptoms (Figure 4) of mood disorders were biomedical causes (36%), followed by personal attributes (33.5%). External causes were used in only 18% of cases, and followed by interpersonal explanations with 12.5%, hence fully confirming the H3.

The general picture from a NLP perspective

The analysis of bi-grams (Figure 5) focused on explanations of etiopathology and therapeutic interventions revealed a notable disparity in their representation. There was a significant overrepresentation of cognitive therapy compared to other therapeutic approaches (with a total of 116 bi-grams), while interpersonal therapy emerged as the second most frequently mentioned, with only 25 pairs identified, and family focused therapy was mentioned only 6 times. Consistent with previous analyses, the application of NLP techniques also unveiled a noteworthy prevalence of language patterns pertaining to individual-based biological (for example, "monoamine oxidase inhibitor," $n = 11$, cortisol level, $n = 7$ etc.) and other intrapersonal explanations (for example, "emotion regulation," $n = 29$, "behavioral activation," $n = 20$, etc.) (Table 1).

Discussion

Our hypotheses were fully confirmed across both textbooks' chapters examined, as they showed very similar explicative patterns. These findings support previous literature on similar topics but conducted with different methodologies (32, 49, 73).

In this paper we tackle the teaching and disseminating side of the issue, by considering how psychopathology both as a content and as a science or *discourse* is produced in handbooks that are adopted as academic textbooks in training courses for mental health professionals.

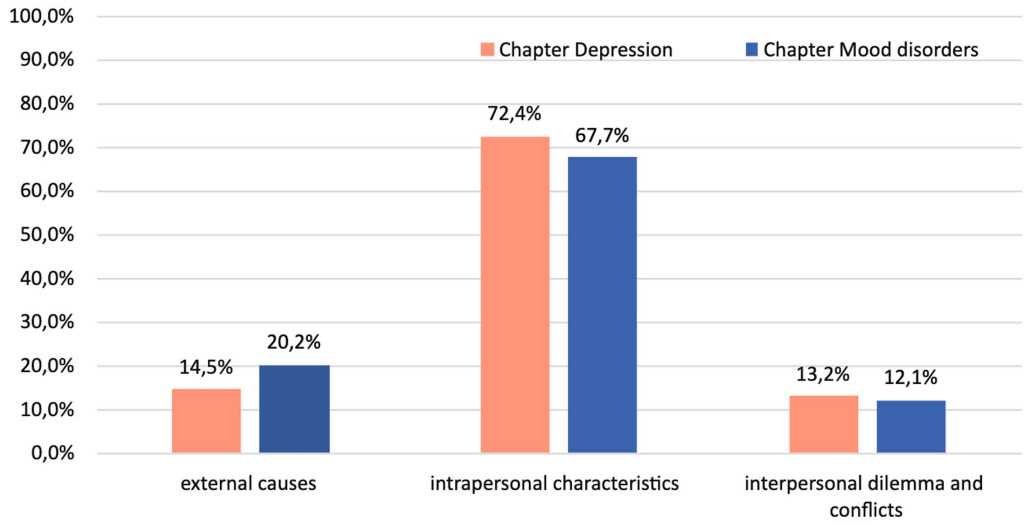

FIGURE 3
Distribution of explanations of etiology and symptoms of mood disorders across the two textbooks (*N* = 200).

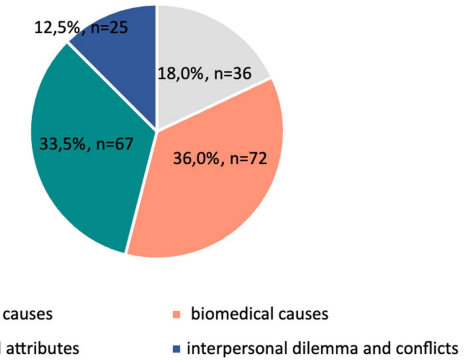

FIGURE 4
Percentage of explanations of etiology and symptoms of mood disorders in the whole corpus (*N* = 200).

We can consider handbooks the pillars underpinning and informing the approach to psychopathology research and practice undertaken by the new generations of freshly trained professionals.

As predicted, these two chapters are dominated by the stark prevalence of monadic explanations (up to 86%) and a very limited presence of dyadic explanations. Overall, the role of triadic or systemic explanations was negligible. This is in contrast with previous trends reported by Davies (1) and studies (46, 50, 51) on lay populations less exposed to the "urban legend."

However, when it came to explaining therapeutic change, there was a significant difference in the breadth of inference fields between the two book chapters: the DeRubeis et al.'s (64) chapter "Mood disorders" mostly focuses on monadic fields and gives very little attention to broader explicative fields.

No less interesting is the etiopathogenetic content of the explanations provided by these handbooks. For years now, the scientific debate has tended to put etiopathogenesis between brackets. Indeed, we found no difference in explanations of etiology and symptoms between the two book chapters: etiopathogenetic explanations were dominated by intrapersonal explanations, with very limited space devoted to external or traumatic factors and even less to relational ones.

These unbalanced views of etiology and treatment factors can have important implications for the therapeutic indication, prognostic optimism and hope for recovery, as well as motivation and commitment to the therapy process. Several studies have demonstrated that participants exposed to biomedical explanations of depression tend to prefer pharmacological treatment, less likely express a willingness to seek psychotherapy, and are more inclined to believe that the solution of the problem lies beyond an individual's control (74–77). Biochemical explanations in patients are associated with prognostic pessimism and less hope for recovery (74, 77–79), as well as increased stigma (80, 81).

Another pitfall in effectively helping people with depression arises from the tendency of both mental health clinicians and patients to perceive psychotherapy as less effective when provided with a biochemical explanation of a patient's symptoms (75, 82, 83). This bias raises substantial concerns because, in such cases, a biochemical attribution can easily lead to overlooking the exploration of broader psychosocial and environmental factors. Consequently, this bias can contribute to a self-fulfilling prophecy, fostering the belief that psychotherapy is ineffective and, in reality, hindering effective coping with depression.

Given all that has been mentioned, we can underscore the risk that already vulnerable or oppressed groups, whose onset of depression might be related to poor social conditions, lack of resources, discrimination and power imbalances, may be further medicalized, disempowered, and marginalized.

The majority of explanations mention intrapersonal factors for disorders (either biomedical or those based on intrapsychic traits and conflicts), which are predominant also in other studies. The prevalence of intrapersonal biomedical explanations (mostly referring to the chemical imbalance theory and genetic factors) implies that these "urban legends" are resistant to change and indeed professional

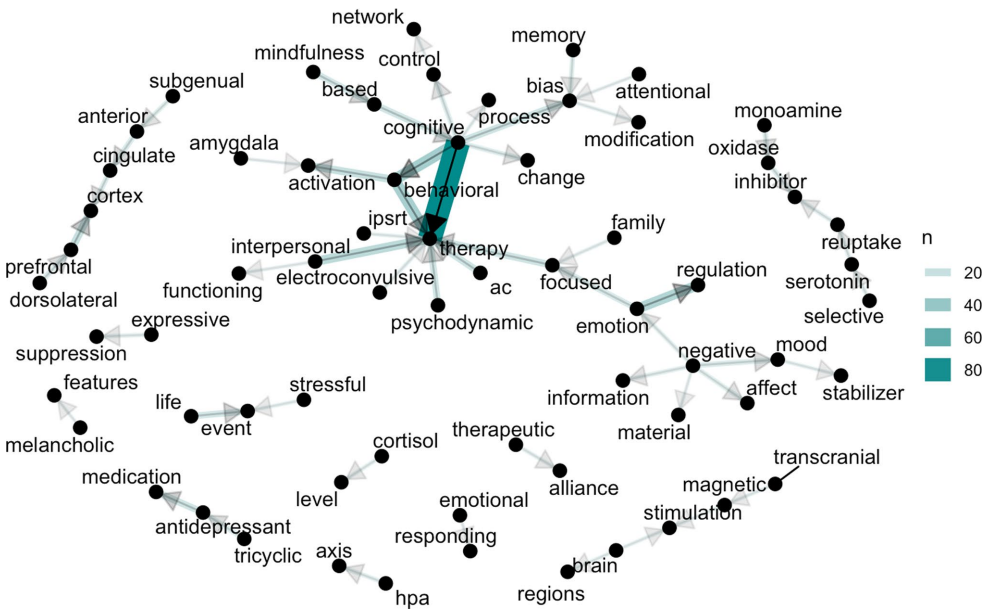

FIGURE 5
Bigram graph of content words related to explanations of etiopathology and therapeutic change of mood disorders. *AC therapy, Acceptance Commitment Therapy; HPA axis, hypothalamus–pituitary–adrenal axis.

textbooks tend to provide unbalanced perspective of etiopathogenic processes with very little consideration of psycho-social factors and life events.

We argue that professional bodies, editors and authors should carefully examine what kind of explanations implicitly or explicitly are privileged in their textbooks and chapters. They should detail openly the ontological and epistemological underpinnings of their literature review and selection, and make evident their allegiances, as well as alternative and contrasting positions.

Our chances to better tackle mood (mental) disorders, and to make the best possible use of available care opportunities, could be significantly improved by measuring the extent to which the professionals' views on depression and their care practices are in contrast with the current state of the art and with what is perceived as meaningful and relevant by the general and clinical population. We agree with Davis (1), that the biological "explanation" forecloses our engagement with meaning making, causing a hermeneutic closure.

Limitations and future research

The exploratory nature of this study is also set by its main limitations. First of all, since the coding procedure is very thorough and time consuming, we analysed only 2 textbook chapters on mood disorders. Although consistent with previous studies (32), our findings may or may not apply to other textbooks and hence cannot be generalized. Some limitations are associated with the fact that both texts adopt the definition of depression according to the Diagnostic and Statistical Manual of Mental Disorders (13); consequently, differences may arise if other manuals are employed. Future investigations should increase the number of disorders and/or textbooks included.

Another limitation of the study could be related to the moderate inter-rater agreement for some parts of the coding procedure; this could due to the very complex and detailed analysis required and could be enhanced by more extensive and in-depth training.

There is not enough research on how clinicians' awareness of their own mental state can influence the choice of intervention in favor of medication or protocolled treatments. In future research, it would be interesting to investigate, for example, whether the degree of implicit anxiety or the implicit sense of helplessness in medical professionals correlates with the recommendation to use antidepressants for their patients.

A third way is possible: reconstructing psychopathology?

But is there an alternative to "over-diagnosis"? Can diagnosis mean something else? It did once. Even the two abovementioned UN and WHO groundbreaking reports seem to give for granted that there is no alternative diagnosis: we either go "diagnostic free" or label, pathologise and medicalise people in distress.

We would also stress that these models of mental health and recovery are imbued with hegemonic neoliberalism both in etiology and in healing, even more so for mood disorders: Emphasis on self-help, moral responsibility of individuals for their problems (42), emphasis on resourcing of individual strengths/capabilities ascribe everything to individual agency (brain chemicals), rather than institutional and social responsibility, structural inequalities (resources for welfare limited or undermined).

In this paper, we argue that another way is possible, if we move beyond nosographic and descriptive diagnosis only, and go back to the original attempts of hermeneutic psychopathology and diagnosis, which aimed at making sense of human distress and lived experience within an ongoing co-constructed conversation with people affected

TABLE 1 Bigram pairs of content words associated with explanations of etiopathology and therapeutic change in mood disorders.

Bi-gram pair	*n*	Bi-gram pair	*n*	Bi-gram pair	*n*
Cognitive therapy	83	Monoamine oxidase	11	Bias modification	6
Cognitive behavioral	34	Negative mood	11	Brain regions	6
Behavioral therapy	33	Oxidase inhibitor	11	Brain stimulation	6
Emotion regulation	29	Tricyclic antidepressant	11	Cognitive process	6
Interpersonal therapy	25	Cognitive change	10	Family focused	6
Behavioral activation	20	Cognitive control	10	IPSRT therapy	6
Prefrontal cortex	20	Memory bias	9	Magnetic stimulation	6
AC therapy	17	Negative affect	9	Mood stabilizer	6
Antidepressant medication	17	Subgenual anterior	9	Stressful event	6
Cognitive bias	17	HPA axis	8	Transcranial magnetic	6
Focused therapy	17	negative emotion	8	Amygdala activation	5
Based cognitive	16	negative information	8	Attentional bias	5
Psychodynamic therapy	16	Reuptake inhibitor	8	Control network	5
Life event	15	Selective serotonin	8	Emotional responding	5
Mindfulness based	15	Serotonin reuptake	8	Interpersonal functioning	5
Emotion focused	13	Cortisol level	7	melancholic features	5
Anterior cingulate	12	Electroconvulsive therapy	7	Negative material	5
Dorsolateral prefrontal	12	Expressive suppression	7		
Cingulate cortex	11	Therapeutic alliance	7		

by it. Structural inequalities and discrimination, just like genes, cannot account alone for mental health etiology. Individual and relational meaning making processes and embodied positionings need to be encompassed to understand why anyone, no matter what their financial, privilege and genetic background, can struggle with psychopathology, and the other way around: why only one of two identical twins growing in the same 'shared' environment should.

If Cosgrove et al. (84) call for "an honest dose of gentle medicine" in psychiatry, we advocate for honest and meaningful psychiatry provision and training to start with.

An alternative framing, typical of systemic models, could involve understanding depression as having one or more important functions and signaling unmet needs, conveying a message to pay attention to some areas of life. Research shows that such an explanation of depression decreases stigma and increases the sense of autonomy and agency in overcoming depression in patients (85). There are different explanations for the role depression adjustment could play; for example, in certain circumstances, depression can be a functional way of relating with others and dealing with limitations (86), or saving energy in situations beyond control (87), or assisting in resolving relational dilemmas (3, 4, 88), etc. Perhaps the multiplicity of explanations is not a mistake but reflects the complexity and the need for exploration of the individual's story and particular circumstances (meaningful relationships, and social forces at play) to uncover the meaning and function of symptoms. If we see the symptom as a creative adjustment to the contextual situation like systemic and gestalt (89) theories have theorised, it cannot be explained *a priori* and for all people with the same diagnoses.

Data availability statement

Publicly available datasets were analyzed in this study. This data can be in the following two published books: (66, 67).

Author contributions

LF: Conceptualization, Funding acquisition, Methodology, Supervision, Writing – original draft, Writing – review & editing. EZ: Data curation, Writing – original draft, Writing – review & editing. LG: Investigation, Supervision, Writing – original draft.

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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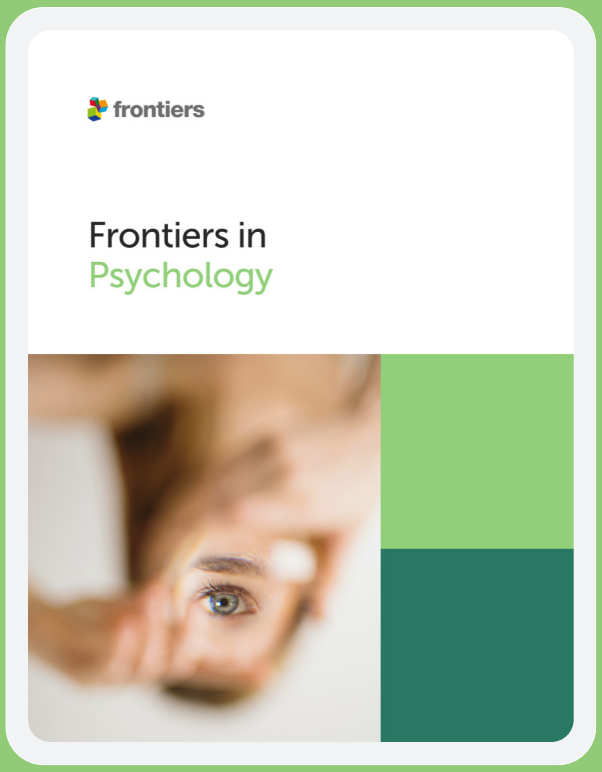

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