THE ROLE OF PLAY IN CHILD ASSESSMENT AND INTERVENTION

EDITED BY : Silvia Salcuni, Claudia Mazzeschi and Claudia Capella

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THE ROLE OF PLAY IN CHILD ASSESSMENT AND INTERVENTION

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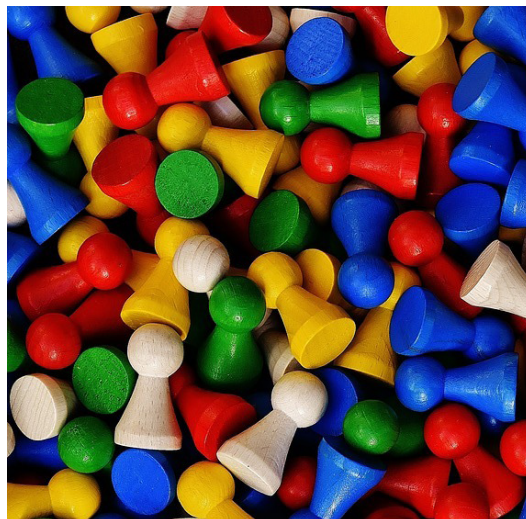
Play is a ubiquitous and universal aspect of early childhood. Although it may take different forms throughout development and across cultures, decades of research have found play to be related to important, positive outcomes. Play provides children with valuable cognitive, emotional, and interpersonal learning opportunities. It can act as a mode of communication for young children and allows them to practice ways of managing complex interpersonal interactions. Specific aspects of play, such as children's creativity in pretend play, have been associated with resilience and coping.

The significance of play in childhood has led to its frequent use in the assessment of child development and in the implementation of child and parent-child psychological and educational interventions. Historically, however, the validity and efficacy of these interventions have not been rigorously evaluated. Further, few assessment and intervention models have included parents, teachers, and other key caregivers, but have focused only on the child.

This Research Topic will bring together the most current literature on the use of play in child assessment and intervention.

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Editorial: The Role of Play in Child Assessment and Intervention

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Editorial on the Research Topic

The Role of Play in Child Assessment and Intervention

In early 2016 we decided to open a Topic about children play, to highlight its important role in child psychological assessment and intervention. Since early 1900's in psychological literature it has been raised the multiple functions of play in child development and the use of play in assessment and treatment with children (Gil, 1991). Play provides children with valuable cognitive, emotional, and interpersonal learning opportunities. The significance of play in childhood has led to its frequent use in the assessment of child development and in the implementation of child and parent-child psychological and educational interventions. Historically, few studies provided a rigorous validation of play assessment measures and empirical evaluation of intervention or psychotherapy efficacy; just a few works have included parents, dyads, or atypical child development. So, as a paradox, even play is a ubiquitous and universal aspect of early childhood, worldwide recognized in its importance for children development, it was not so easy to find a group of colleagues that rigorously evaluated validity and efficacy of assessment and interventions based on children play. We are pleased to present to the readers a final research E-book that includes the work of 60 authors from many states of America, Austria, Brazil, Chile, India, Italy, Turkey, and UK, and showed the most current literature on the use of play in child assessment and intervention in its 15 articles.

Among those articles, various study the role of play in assessment. Within those, the state of the art about psychometric and cognitive characteristics of most common play and coping measurement instruments was proposed by Capurso and Ragni. They reviewed and compared the principal developmental functions of play with the different stages of the coping process, proposing that play should be considered an elective form of coping with most aspects of children's lives, highlighting the necessity to adopt methodologies that toward play enable an accurate recognition of coping. To fill the gap about the paucity of standardized and valid measures specifically devoted to assess the core domains involved in play activities, a series of papers were devoted to measure external and construct validity of the Affect in Play Scale-Preschool (4–5 years APS-P) and its Extended Version (6–10 years APS-P Extended Version), semi-structured parallel tools designed to explore child's cognitive and affective processes using a 5 min standardized play task. Delvecchio et al. validate APS-P and its Extended Version to 538 Italian children aged 4–10, assessing gender as well as age differences. Results supported the use of both tools as adequate measures to assess the interplay of cognitive and affective skills in preschool and school age children. These tools exist also in Brief version (APS-P-BR and APS-P-BR Extended Version) scored *in vivo*, without video-recording procedures. In wide sample Italian children aged 4–10 years, Di Riso et al. showed how APS-P-BR and its Extended Version factor scores were strongly related to APS-P Extended Version factor scores suggesting that the APS-P-BR and its Extended

Version are an encouraging brief measure to assess pretended play using toys. Through the use of APS, Federici et al. investigated 63 scholar children's representations of the three main models of disability (medical, social, and biopsychosocial) and how these models affected cognitive and affective components of non-clinical children's play. Results showed significant effects on the affective components of play, and no-one on cognitive components or on a variety of affect, demonstrating that, when children are involved in pretend play, independently from which concepts of disability emerge, they exclusively related to the medical model of disability. George and Solomon examined the predictive validity of the Attachment Doll Play Assessment to caregiving accessibility and responsiveness assessed from mother-child interaction and maternal representation. Sixty-nine mothers and their 5–7-year-old children were observed during a pre-separation dyadic interaction task. Child security with the mother was associated with positive dyadic interaction and flexibly integrated maternal caregiving representations. Child controlling/disorganized attachments were significantly associated with problematic dyadic interaction and dysregulated-helpless maternal caregiving representations. Standing within the dyadic interaction, Fadda and Lucarelli investigated longitudinally the relations between mother–child interactions during feeding and play and child's pre-verbal communicative abilities in extra-dyadic interactions during play, in 20 dyads comparing those with functional interactions vs. dysfunctional interactions. A stable relation over time between mother–child interactions and child's social communicative skills in extra-dyadic interactions emerged. Another important longitudinal design was used by Salvatori et al., highlighting the preterm birth weight as a strong risk factor for early mother-infant interactions. Ten minutes of mother-child play interaction were recorded and later coded according to the Emotional Availability Scales. Preterm birth weight affects the quality of mother-toddler interactions, especially in the case of Extremely Low Birth Weight children.

Remaining within the field of play assessment, three papers put their attention to samples of children with clear disabilities. Bentenuto et al. analyzed 75 mothers' involvement in child play sessions, using a coding system for exploratory and symbolic play. Children presented Autism Spectrum Disorder, Down Syndrome, and typically developing children. Results indicated that children with ASD showed more exploratory play compared to children in the other groups and no significant differences emerged between the three groups for child symbolic play or for mother play. Using rigorous observational methods to assess spontaneous pretend play, Kang et al. analyzed predictors and moderators of spontaneous pretended play in children with and without Autism Spectrum Disorder. Results showed the negative effect of ASD symptoms on pretend play was simultaneously moderated by low ToM and high verbal ability, both related to less pretend play production among children with more ASD symptoms. In a sample of 40 children affected by Down Syndrome, Fasulo et al. explored the video records of an interaction between a child and a practitioner, during the administration of the Bayley Scale of Infant and Toddler Development, using Conversation Analysis approach. The analysis of the sequences shows that the assessor promotes the child's engagement by coaching the actions required to administer the item in utterances with marked child-directed features. Moreover, the objects constituting the test item did not suggest to the child a unique course of action, leading to the assessor's modeling of the successful sequence. Authors proposed different important argumentation about data.

Even though there is substantial evidence that play-based therapies produce significant change (Ray et al., 2001), the specific play processes in treatment remain quite unexamined. A longitudinal qualitative study in the psychotherapeutic process of children who have been sexually abused was carried out by Tornero and Capella. Participants between the 7 and 10 years old were observed during three sessions of sand tray at different moments of therapy. Results revealed common and transversal forms of playful expression among this group of children shown by their engagement with sand-play, from the elaboration of personal stories that feature violence as a central theme, passing through the expression of their need for care and protection. The shifting dynamics of sandplay at each stage of therapeutic treatment is an important finding of this study that reveals the progress made during psychotherapy. Halfon et al. measured processes of change in long-term psychodynamic play: the Children's Play Therapy Instrument was used generating discrete and measurable units of play activity arranged along a continuum of four play profiles; through non-linear models, the results showed a picture of how these children express different psychic states in play, captured through the lens of play profiles, and begin to modify less dysfunctional profiles over the course of treatment. Finally, Salcuni et al. focused on a single case process-outcome design to evaluate play and verbal discourse of 30 psychotherapy sessions of a 3-year once-a-week psychodynamic psychotherapy, carried out with a 3-year-old girl. The Play Category System, the APS-P and Verbal Production, empirically measured, showed significant changes along the unfolding of the therapy: verbal production and discourse ability progressively increased and took the place of play, which instead became more symbolic.

In the main frame of psychotherapy, very impressive is the opinion by Ramires. Passing through a psychoanalytical as well as attachment theory review, Ramires focused on psychotherapeutic process, demonstrating that playing is an essentially intersubjective activity, that enables the construction/organization of internal and external realities. In line with this viewpoint, Rice, with a commentary about Shaheen's paper (2014) proposes that psychoanalytic psychotherapy with children advances executive function development through its promotion of implicit emotion regulation capacities through the technique of defense analysis, using programs based on common children games. Guidelines about how to develop play abilities either within the family, the nursery and pre-school context and, of course, the clinical setting, are proposed.

This collection of articles shows the development of several research with different population and research techniques. However, as a whole, contribute to the evidence of the important role of play in psychological assessment and treatment in children.

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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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Bridge Over Troubled Water: Perspective Connections between Coping and Play in Children

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We propose that children's play and coping strategies are connected. However, this connection has often been overlooked in the literature. To prove our hypothesis, the principal developmental functions of play are reviewed and compared with the different stages of the coping process. Our results show that coping and play are essential elements in child development, and indicate the presence of several overlapping areas where play and coping intersect. In spite of this, their interrelationship has seldom been examined. We explore the possible reasons for this omission with reference to the different natures of play and coping constructs, and also to the definitive psychometric and cognitive characteristics of most common coping measurement instruments. We conclude by proposing that play should be considered an elective form of coping in most aspects of children's lives. We also propose that methods to measure coping in children should be improved and a more analogical approach should be adopted toward play to enable accurate recognition of coping.

Keywords: children, play, coping, appraisal, multidimensional, emotional regulation

INTRODUCTION

Coping and play are widely recognized as being crucial to child development. In different ways, they both support mental, physical, social, and emotional well-being and the ability to adapt (Bjorklund and Pellegrini, 2002; Russ, 2004; Ginsburg, 2007; Skinner and Zimmer-Gembeck, 2007; Aldwin, 2009; Zimmer-Gembeck and Skinner, 2016). Here, we aim to highlight limits in current coping theories that obscure the importance of play and show possible future developments for integrating both constructs.

COPING

Coping is a strategy employed to manage and adapt to stressful and ever-changing environments and situations (Lazarus and Folkman, 1984). Stressors and coping responses vary throughout life and appear to be linked to the individual's appraisal of the situation, the type of problem faced, socio-cultural aspects and the developmental stage of the subjects (Losoya et al., 1998; Skinner and Zimmer-Gembeck, 2007; Clauss-Ehlers, 2008; Aldwin, 2009).

According to a developmental perspective, coping is a regulatory processes mediating the interrelation between the individual and the environment (Compas et al., 2001; Zimmer-Gembeck and Skinner, 2016), and it characterizes how children face and respond to stressors both in adaptive and maladaptive ways (Zimmer-Gembeck and Skinner, 2016). The adaptive nature of

coping is fundamental for human wellbeing; as outlined by Lazarus and Launier (1978), a coping response is even more important than the stressor itself. Effective coping has been associated with important outcomes in childhood and adolescence, such as academic performance, social functioning, adaptation to stressful life events, internalizing and externalizing behavior, well-being, competence, and resilience (Zimmer-Gembeck and Skinner, 2011, 2016).

Normative Development of Coping

Coping adapts and develops as a joint function of internal traits and environmental characteristics (Skinner and Zimmer-Gembeck, 2007; Zimmer-Gembeck and Skinner, 2016). Infants engage in reflex actions mediated by their own temperament (Rueda and Rothbart, 2009), and volitional coping strategies start to emerge from early childhood (Compas et al., 2001). As children mature, their coping strategies develop as follows:

- Initial stage of social referencing (Klinnert et al., 1983; Fonagy et al., 2007), where children quickly attune to their caregiver's reactions to assess potential dangers and whether they should engage or withdraw from the external situations;
- Concurrent stage of interpersonal coping, in which children intentionally instigate coping actions in their caregivers through by communication aimed at producing the desired results (Zimmer-Gembeck and Skinner, 2016);
- Predominance of distraction strategies in younger children and progressive differentiation of this trend in children over 4 years old (Zimmer-Gembeck and Skinner, 2011).
- Gradual shift from behavioral actions to more cognitive-based and emotion-focused forms of coping (Losoya et al., 1998; Spirito, 2003);
- Increase in problem-solving and the ability to regulate the coping response according to the stressful situation (Zimmer-Gembeck and Skinner, 2011);
- Development of regulation strategies that in turn increase the use of emotion-focused forms of coping from age 6 onward (Band and Weisz, 1988; Altshuler and Ruble, 1989; Aldwin, 2009);
- Increased seeking for social support and the shift from parent-centered help to peer support, especially for emotional problems (Crystal et al., 2008).

Developmental Limits of Current Coping Models

The main limitation of current studies into children's coping strategies is the tendency for children's strategies be regarded in the same way as those of adults. This is caused by three main factors.

The first is the persistence of many analytical tools that are either directly or indirectly derived from adult-driven instruments and pre-existing theories (Ryan-Wenger, 1992; Moreland and Dumas, 2008). As a result, coping categories for children are not based on directly observed realities, but rather on the views of other scholars. Such theory-driven categories overlook the real situation and prevent researchers identifying aspects of behavior that do not fit with what is expected (Ford

and Lerner, 1992; Telfener, 2011; Monette et al., 2013). The limits of this approach were shown in an interview-based research conducted by Band and Weisz (1988), where approximately 40% of the children's responses fell outside of the coping categories used in adult studies, and new specific categories had to be established to properly classify the children's responses. Compas et al. (2001, p. 87) argued, "The way in which coping is conceptualized influences methods of measurement and defines the scope of what is included within the rubric of coping. Many of the problems in the field have come from the lack of clarity and consensus regarding the nature of coping during childhood and adolescence."

This leads to the second factor. If the construct of coping is cognitive in nature, then children's coping tools should align with their cognitive developmental stage, as defined by current theories in the field. For instance, if the coping strategy of a group of children in the preoperational stage, as defined by the Piagetian theory, is to be measured, then the tool should consider egocentrism, symbolic play, animism, irreversibility, etc.

Finally, many of the coping categories identified by the current measurement tools are mutually exclusive (Ryan-Wenger, 1992; Skinner et al., 2003), where a specific action is interpreted only as a single type of coping strategy (e.g., "go out and play" is only classified as distancing from the stressful event). While such an approach serves the need of a taxonomy-based construct (Reynolds, 1971), it inevitably fails when faced with the multidimensional characteristics of play, leading to a partial and incomplete consideration of its potential.

Play: A Neglected Aspect in Coping Studies

As a consequence of the above-mentioned limits, the role of play has often been neglected in coping research. A review by Capurso and Pazzagli (2015) showed that out of 40 studies on coping in children, play was either disregarded or only considered as an avoidant or distracting activity. Additionally, a search for "play" in some of the most recent reviews and theoretical papers on coping and child development (i.e., Ryan-Wenger, 1992, 1996; Fields and Prinz, 1997; Losoya et al., 1998; Compas et al., 2001; Zimmer-Gembeck and Skinner, 2011, 2016), has not revealed any meaningful discussion of the term. Play is often not mentioned, or when it is, is only seen as an attempt by the child to distance themselves from the stressor or delay the need to face the situation.

COPING FUNCTIONS ARE PRESENT WITHIN PLAY THEORIES

Conversely, the adaptive and evolutionary functions of play have been studied for many years. Ellis (1998) asserted that play is a biological function to mediate adaptation to unpredictable threats, whilst others suggest that play is a crucial component in children, representing central evolutionary and natural values that continue throughout life (Sutton-Smith, 1997), and mediating adjustment during childhood (Bjorklund and Green, 1992). Given the characteristics of these two constructs, the three

main areas where play and coping encounter are cognitive, social and emotional.

Play as a Means of Cognitive Adaptation to Reality

The benefits of play for cognitive development have long been recognized (Bergen, 1998). Piaget (1951) suggested that play could consolidate skills and thus engender confidence and a sense of mastery. In younger children, play enables them to assimilate everyday experiences into existing schema, act out established behaviors, and adapt reality to their own thoughts. Exploratory play is the basis for learning, achieving goals, and growth (Jambor and van Gils, 2007; Fromberg and Bergen, 2015). As children develop, play increases in complexity, reflecting the maturation of the brain and its functions (Gordon, 2014). Bruner (1983) defined play as an activity without frustrations in which children explore and organize the world according to their desires and experience pleasure in overcoming obstacles. These aspect of play are connected to the appraisal stage of coping, where children assess the external reality to identify and later trial solutions in a way that is at the same time safe and not frustrating.

Play as a Mediator with a Social and Cultural World

Vygotsky (1967) examined how play promotes self-regulation and learning of cultural values. He considered play as a way to for children to realize their wishes in terms of their cognitive development because it facilitates symbolic representation of the wider socio-cultural world. Following Vygotsky, others observed that children learn how to set limits in a play setting, using symbolic thinking, planning, role-taking, and self-regulation (Bergen, 2015). This aspect also connects to the contextual nature of coping adaptation, where the efficient adaptive responses to stress need to take proper account of the local culture and social context. In addition, play has also been linked to more formal cultural expressions such as academic learning. Roskos and Christie (2001) outlined the role of play in the development of literacy, while Cook (2000) saw that preschoolers could be effectively engaged in playful activities related to mathematical concepts.

Play and the Emotional Processing of Stress: The Transitional Space

Scholars have previously outlined the importance of play as a mean of connecting with our emotions. Sigmund Freud (1960) saw play as a way for children to realize their wishes and to overcome traumatic events, providing a safe context to express impulses that are too dangerous to vent in reality. A similar view was shared by Erikson (1993) who considered play as a way to deal with emotional and behavioral dilemmas; Anna Freud (1928) studied how children's play fosters the ability to face trauma such as war or parental separation.

According to a psychodynamic view, the deep nature of play is ambiguous. Winnicott (1971) explains this by placing play in a special transitional area, where fantasy and external reality coexist. Such a space represents the transition from omnipotence, where the child feels that they can create the world, to an objective and sometimes frustrating reality, where the world is beyond their personal control. Winnicott (1971, p. 51) states that "into this play area the child gathers objects or phenomena from external reality and uses these in the service of some sample derived from inner or personal reality." The transitional space is in the middle ground between the child and the environment, where the mind moves free and is creative, exploring different possible scenarios connecting fantasy and reality.

The Coevolutionary Multiplex of Play Functions Meet the Contextual Nature of Coping

In general theoretical terms, the development of play theory corroborates the ambiguous and multifaceted nature of play. After considering hundreds of children's games in New Zealand (Sutton-Smith, 1959, 1975) and analysis of more than 135 play concepts (Sutton-Smith, 1997), the developmental psychologist and play theorist Sutton-Smith concluded that play was a "Coevolutionary Multiplex of Functions" (Sutton-Smith, 2008, p. 111), where play was recognized as having multiple characteristics across a variety of relevant functional domains that are "genetic, affective, performative, experiential, and culturally relative" (Sutton-Smith, 2008, p 116). While this later view may render a definition of play relative and therefore hard to attain universally, it has the advantage of allowing for a wide set of different play settings, aims and function over time. Such characteristics make matching with the contextual nature of coping constructs possible, since also coping is linked to individual and socio-contextual traits.

EMPIRICAL CONTRIBUTIONS CONNECTING PLAY AND COPING

Several empirical studies of play show meaningful connections with coping in children. (Russ et al., 2000; Russ, 2004) maintained that the cognitive, affective, and interpersonal processes in play mediate key developmental capabilities such as creativity, problem solving, coping, and prosociality. A psychometric scale to measure children's ability to process emotions through play was developed and the researchers suggested that in fantasy play children can create controllable events while venting negative emotions. This increases positive feelings and reduces anxiety (Christiano and Russ, 1996; Saunders et al., 1999; Lester and Russell, 2008). Russ (1999, 2004) and Strayhorn (2002) suggested that when children play within a creative framework, they are actually testing adaptive solutions on cognitive, behavioral, and emotional levels, and this practice is linked to their ability to cope with difficult situations in everyday and later life. Rutter (1985) argued that play develops adaptability and flexibility, supporting children in facing stressful situations, which is also one of the main purposes of coping strategies. Tegano et al. (1989) and Schaefer and Drewes (2010) recognized the importance of play as a mediator of coping. They suggested that the lack of fear of any real consequences and the autonomy
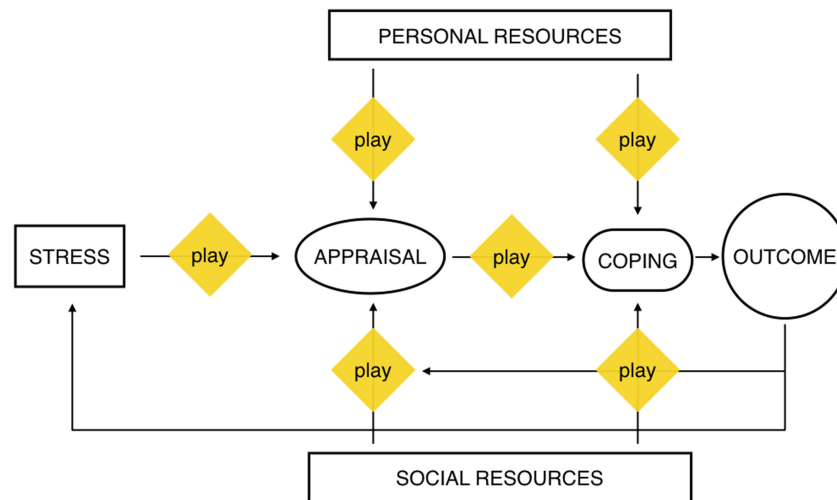
FIGURE 1 | Coping as a transactional process (adapted from Zimmer-Gembeck and Skinner, 2016) integrated with play functions. Original Picture Copyright © 2015 John Wiley & Sons, Inc. All rights reserved.

experienced in play allowed children to develop new solutions, helping them to comprehend and solve their social and personal problems.

Social play is another key aspect connected to coping. This involves a child taking on different roles and increases the development of communicational skills, problem-solving and empathy (Hughes, 2009). Free social play is related to the ability to understand others' viewpoints, helping, cooperating, sharing and problem-solving (Gleave, 2012). Conversely, children who had lost their capacity for creative play after a trauma were hindered in forming social relationships and showed decreased problem-solving capabilities (Lovett and Boyd Webb, 2010). Play can be associated with coping because once the game is over, the lessons remain: new learning and understanding "endure as a new found creation of the mind, a treasure to be retained by the memory…," and becoming "… a cultural phenomenon" (Huizinga, 1949).

An emblematic setting where different kinds of play have repeatedly shown coping potential is in a hospital. For example, Haiat et al. (2003) and Hubbuck (2009) showed that play with puppets helps children to understand medical procedures, creating a positive attitude toward the stressful situation. They also recognized the importance of spontaneous play, especially in children's ward, as this could help the children to understand and consolidate new or complex information. To properly recognize the role of narrative and fantasy in helping children deal with the stressful circumstances of a chronic illness, Clark (1998, 2003) coined the term "imaginal coping." The most relevant imaginal coping activities identified are fantasy play, role- and role-reversal play, rituals, stories, humor, and prayers (Clark, 2003; Rindstedt, 2014), all of which are usually carried out with some level of social interaction. Ritual play as an active response to anxiety and health care procedures is further analyzed by Gaynard (2016), who recognizes its function as a holder for- and molder of, feelings.

CONNECTING PLAY AND COPING: THEORETICAL FACETS

There are several areas where play can be connected to coping. In children at the preoperative and concrete stage of development (ages 3–10), play may act as an initiator of forms of conjectural thinking. To visualize different solutions and assess different coping actions, in situations of distress, adults start a chain of "if-then" mental statements (Lazarus, 1991); whereas children, lacking the ability of abstract thought, can "pretend-play about it," envisioning solutions and testing them in a safe and imaginative context. Additionally, in pretend play young children show signs of understanding others' thinking and beliefs when confronting reality, which is a key component commonly found both in coping and in play activity.

Figure 1 shows the different stages of the coping process (Zimmer-Gembeck and Skinner, 2016) and how play can act as a mediator at different times. It begins with play mediating the different components in the appraisal phase (the stressor, the assessment of personal and social resources and the potential coping strategy itself) and it then continues with play mediating the coping action with personal and social resources. These aspects should all be the focus of future research.

Because play is a widespread means of communication and a natural language for children (Drewes and Schaefer, 2010; Landreth, 2012), it makes universal communication possible, regardless of their linguistic and cultural differences. Play also offers a natural mediator when working with young people in distress, even if they are from diverse cultures or backgrounds (O'Connor, 2005). Proper consideration of play should not attempt to reduce distinct playful behaviors to a single coping category; rather, to fully appreciate the potential of play as a coping mechanism, its multifaceted and multidimensional nature should be recognized (Huizinga, 1949; Sutton-Smith, 1997). This peculiar characteristic of play should be acknowledged and

accepted in any investigation of children's coping behaviors and strategies.

FUTURE RESEARCH AND OPEN QUESTIONS

The relationship between the assessment of children's coping strategies and play calls for further research in two main areas.

From a theoretical viewpoint, despite studies relating children's coping to play behaviors (e.g., Russ, 1988; Prinstein et al., 1996), there is a need for a framework to explain the relationship between play and coping. Finding this type of connection is difficult due to the profound disparities in the nature of these two aspects of human behavior. The free and intrinsic origins of play relate to a free and unregulated world; it is ambiguous and its expressions vary with culture, age and location (Winnicott, 1971; Sutton-Smith, 1997, 2008). Coping is related to volitional cognitive processes, and is generally categorized using mutually exclusive taxonomies.

Regarding the psychometric evaluation, future investigation should address the creation of coping instruments capable of operationalizing and validating the role of play and its multifaceted nature. Systematic observations of play sessions during assessments of coping skills would be useful, following the example of several scales developed to measure affective expression and self-regulation in children (Shapiro et al., 1994; Russ et al., 2000). Appropriate categories for play assessment could be connected, in a non-exclusive way, with established coping categories in children, such as those described by Zimmer-Gembeck and Skinner (2011).

Play is a fundamental part of a child's life, while autonomous coping skills become increasingly important in adulthood. Coping is akin to walking across a bridge over troubled waters, but play shows children different options and enables them to choose which route to take. The metaphor of our title recalls the power of play as a mediator helping the children to work out coping solutions; and the role of play as a mediator between coping and the stressors. The aim of this paper was to connect the free and fantastical world of play with the more rational and grounded theory of coping in children. In doing so we focused mainly on the interconnections of play and coping, outlining the adaptive functions coming from the unregulated characteristics of play. There are, of course, types of play and settings where play is indeed much more structured and this also helps children to cope. In the end, play remains a universal language and a means for children to express themselves. A proper connection with coping will help more children to develop and become more resilient when facing adversity, and this is surely a field worth exploring for any researcher in human development.

AUTHOR CONTRIBUTIONS

MC initiated and planned the outline of the article, conducted the research on children's coping strategies, performed the comparisons of coping and play, and discussed the differences between the two. He also edited the main text of the article. BR researched children's play and drafted the paragraph about play and child development. She also reviewed the manuscript critically and contributed to the discussion.

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How Do You Play? A Comparison among Children Aged 4–10

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Pretend play has a central role for children's development and psychological well-being. However, there is a paucity of standardized and valid measures specifically devoted to assess the core domains involved in play activities in preschool and primary school children. The Affect in Play Scale-Preschool (4–5 years) and the Affect in Play Scale-Preschool Extended Version (6–10 years) are semi-structured parallel tools designed to explore child's cognitive and affective processes using a standardized play task. The current study administered this 5-min play task to 538 Italian children aged 4–10. The purposes were to compare play abilities in boys vs. girls and in preschool vs. primary school children, to correlate pretend play with divergent thinking and to evaluate the structural validity of the measure along the considered age span. No differences, excepting for Organization, were found between boys and girls, whereas school age children reported higher play abilities then the younger ones. External validity was assessed using correlational analysis with the divergent thinking task (the Alternate Uses Test) for preschoolers and primary school-aged children, in line with findings from Manova. Construct validity, assessed through the Confirmatory Factor Analysis, showed good fits for the two-factor model with cognitive and affective factor for both the Affect in Play Scale-Preschool and its Extended Version. A multi-group factor analysis suggested a partial invariance of the two-factor model across preschool (4–5 years old) and primary school-aged (6–10 years old) children. Results supported the use of the Affect in Play Scale-Preschool and its Extended Version as adequate measures to assess the interplay of cognitive and affective skills in preschool and school age children. The discussion highlights clinical and research implications linked to the possibility to have a unique play task able to assess child's affective and cognitive abilities throughout a quite wide life span (from 4 to 10 years old).

Keywords: affect in play scale-preschool version, affect in play scale-preschool extended version, construct validity, divergent thinking, Italian children

INTRODUCTION

Pretend play represents symbolic behavior in which "one thing is playfully treated as if it were something else" (Fein, 1987). Pretend play is characterized by children's exploration and interpretation of the world in terms of symbols and images, fantasy, make-believes, expression of emotions, and their capacity to understand different situations in an imaginary context (Russ, 2004). Pretend play allows the child to comprehend and discover his world, talk about emotions, and integrate internal states and external actions (Stagnitti et al., 2007). In pretend play, children

have the opportunity to act out social situations that facilitate their understanding of the world in which they live (Bundy-Myrow, 2005; Ferland, 2005; Moore and Russ, 2006). As such, pretend play could be thought as "practice for real life." Pretend play represents the integration of cognitive and affective processes. Cognitive processes comprehend, among others, divergent thinking, symbolism, and a fluent organization of stories. Affective processes include expression of emotions and affect themes in the play story.

Pretend play peaks and takes on special significance in preschool years (Singer and Singer, 1990; Bergen, 2002; Pellegrini, 2010). During these years, pretend play has been associated with language, as well as, emotional and social abilities development (Westby, 2000; Uren and Stagnitti, 2009). However, pretend play assumes a very important role also in elementary school-age years. Pretend play in preschool and school years children was related to divergent thinking (Russ and Schafer, 2006; Delvecchio et al., 2016b), coping ability (Christiano and Russ, 1996), problem solving and adjustment (Russ, 2004, 2006), perspective taking and emotional understanding (Seja and Russ, 1999; Fehr and Russ, 2014), empathy (Delvecchio et al., 2016a), and self-rated emotional experience (Russ and Grossman-McKee, 1990; Hoffmann and Russ, 2012; Russ, 2014) and growing capacity of self-regulation (Berk et al., 2006). Thus, having valid and reliable measures to assess pretend play abilities in children it's necessary (Bergen, 2002; Pellegrini, 2010).

Previous studies highlighted the paucity of standardized tools for pretend play and stressed that most of the existing ones are not able to assess child's development in a broad manner, paying attention to both cognitive and affective aspects (Delvecchio et al., 2016b). To date the Affect in Play Scale (APS; Russ, 1993, 2004) and its Preschool version (APS-P; Kaugars and Russ, 2009) are two of the few valid and empirically-based pretend play measures that assess both cognitive and affective processes involved in play. An increasing number of research studies have supported the adequacy of their psychometric characteristics in both the United States and in Italy (Russ, 2004; Mazzeschi et al., 2008; Delvecchio et al., 2016b). However, the different stimuli of APS (puppets) and APS-P (toys) and the different age-group involved (i.e., 4–5 years old for APS-P and 6–10 for APS) emphasize the difficulties in having a valid instrument able to compare preschool and school-aged children's pretend play abilities. Recently, to overcome this issue, Delvecchio et al. (2016a) adapted the APS-P (APS-P Extended Version) for primary school children, motivating this extension as the following: (1) school-aged children often play in a more joyful way with toys than puppets (Mazzeschi et al., 2008); (2) having a tool able to compare children throughout a wider age-span would be a useful improvement for both clinical (e.g., for children with developmental delay) and research settings. The first Italian research on psychometric properties of APS-P and APS-P Extended Version evidences promising results (Delvecchio et al., 2016a,b). More specifically, confirmatory factor analysis (CFA) showed the adequacy of the APS-P original model (Russ, 2004) which includes two correlated factors: one cognitive (organization, elaboration, imagination, and comfort) and one affective factor (frequency and variety of affects) for both the preschool and its extended versions. External validity

was proved correlating the play task with measures of divergent thinking, children's temperament, prosocial behavior, school coping, and empathy (Delvecchio et al., 2016a,b). The APS-P and the APS-P Extended Version share the same stimuli and scoring system and they attempt to fill the gap of "discontinuity" between the age-span.

The aim of this paper is to investigate the use of this "common" tool in a sample of preschool and primary school children. This paper investigated reliability and validity of the APS-P and APS-P Extended Version with Italian children aged 4–10. As preliminary result, interrater reliability was assessed and expected to be excellent, as previous studies found (Delvecchio et al., 2016a,b). Descriptive statistics for the overall sample and separately for boys and girls as well as for preschool and school children were calculated. According to previous studies on playing no significant gender differences were expected (Stagnitti et al., 2007; Kaugars and Russ, 2009). However, significant differences were expected between preschool and school age children (Mazzeschi et al., 2008; Chessa et al., 2011). It was expected that elementary school children showed higher abilities in organizing and elaborating the stories; they were expected to use more fantasy and to express higher comfort during the play task. At the same time, they were supposed to use a higher amount of affect expressions and a wider variety of categories of affective themes suggesting that school age may possess a greater use and comprehension of emotions (Denham et al., 1994). Moreover, external validation of the APS-P and its extended version variables was carried out by investigating its relationships with the divergent thinking. Significant correlations, with medium to low effect sizes, were expected. Then, a confirmatory factor analysis was run separately for preschool and primary school children to assess the adequacy of the two-factor model with a cognitive and affective correlated factors, as previously found in Italian preschool (Delvecchio et al., 2016b) and primary school children (Delvecchio et al., 2016a). Finally, a multi-group confirmatory factor analysis (MCFA) was run on APS–P and APS-P Extended Version, looking for the measurement invariance of a two factor model between preschool and primary school children (Russ, 2004; Chessa et al., 2011; Delvecchio et al., 2016a,b).

MATERIALS AND METHODS

Participants

A sample of 538 Italian children (261 boys, 277 girls) aged 4–10 years ($M = 6.61$, $SD = 2.20$) were enrolled in this study. Ten kindergartens and 8 primary schools from urban areas of Central and Northern Italy were contacted. Specifically, 239 children (44.4%) were preschoolers whereas 299 (55.8%) came from elementary schools. All children were Caucasian and were in mainstream classrooms. Family socioeconomic status was measured using the SES scores by Hollingshead (1975) and showed a majority of middle-class (i.e., SES level 3) families, 16% came from a high socioeconomic context (i.e., SES levels 4 and 5) and 4% were from economically disadvantaged families (i.e., SES levels 1 and 2). Children' distribution in gender, age, and SES was not significant different from the overall sample. According

to their teachers, all children were developing typically. Before starting the task, preschoolers' cognitive and verbal skills were assessed using two subtests (vocabulary and bloc design) of the WPPSI-III (Wechsler, 2008). In order to participate in the study, a score higher than 8 was mandatory. At the same time, for primary school children, cognitive, and verbal abilities were confirmed by teachers' reports on the basis of Italian language and maths tests.

Procedure

This study was conducted in compliance with the ethical standards for research outlined in the Ethical Principles of Psychologists and Code of Conduct (American Psychological Association, 2010) and approved by the Ethical Committee of the Department of Psychology of the University of Padova (Italy). Participation in the study was solicited via leaflets. School approval and parents written signed informed consent to participate in the study were obtained before data collection. Children were asked to provide their own oral consent. No incentives were awarded and voluntary participation was emphasized. Administration was proposed during scheduled classes, according to the standard administration procedures. Confidentiality was assured by replacing children's personal information with a numeric code.

Measures

Affect in Play Scale-Preschool and Affect in Play Scale-Preschool Extended Version

The Affect in Play Scale-Preschool Version (Russ, 2004; Kaugars and Russ, 2009), and its extended version (Delvecchio et al., 2016a), are 5 min video-recorded play task assessing child's affective and cognitive dimensions, using a standardized and empirically validated administration procedure and scoring attribution (Russ, 2004, p. 19). Children to accomplish the task should play with a set of stuffed and plastic toys (Russ, 2004), specifically selected to elicit a range of different emotional expression. Although, the stimuli and scoring system did not change from APS-P to APS-P Extended Version, the instructions for the APS-P Extended Version were slightly modified avoiding direct speech and using the indirect one (for detail see Delvecchio et al., 2016a). APS-P and APS-P Extended Version (4–10) scoring system comprehends six primary scores: Organization, Elaboration, Imagination and Comfort, Variety and Frequency of Affective Themes. The first four scores refer to the cognitive dimension, while the last two belong to the affective domain and the emotional expression of play. Cognitive scores are coded on a 5-point Likert scale, with higher values suggesting higher play abilities. Organization assesses the quality of the plot, the complexity of the story, and the coherence of the play narrative; Elaboration assesses the amount of variety and complexity of embellishment in the plot, facial expressions, sound effects, the toys used, and character development; Imagination refers to the novelty and uniqueness of the play and the ability to pretend and use fantasy, the ability to transform the blocks and pretend with them and Comfort measures the child's ability to engage in the play task, the involvement of the child in the play and enjoyment of the play. Referring to the affective domain, Frequency of Affect Expression, counts affects expressed by the child in the play narrative, whereas the Variety of Affect score is the number of different affect categories expressed by the child during the play. Beside the six main scores, four minor ones are available: Positive affect score including themes of nurturance/affection, happiness/pleasure, competition, oral, sexual; Negative affect one referring to aggression, anxiety/fear, sadness/hurt, frustration/disappointment/dislike, oral aggression, anal. Furthermore, starting from the Variety of Affect score is possible to calculate Positive affect variety as well as the Negative affect variety scores. Interrater reliability reported excellent values as well as the internal consistency of the scales (Kaugars and Russ, 2009; Chessa et al., 2011; Fehr and Russ, 2014; Delvecchio et al., 2016a,b).

Alternate Uses Task Assesses

Divergent Thinking based on Wallach and Kogan's (1965) adaptation of Guilford's Alternate Uses Task. The task includes a list of six common objects (a newspaper, a box, a button, a key, an automobile tire, a shoe, and a knife) and requires telling as many alternative uses for those objects. Alternate uses task scoring system comprehends two scores: (1) Fluency referring to the amount of acceptable possible uses listed and (2) Flexibility referring to the amount of different categories of acceptable possible uses listed by the child. Psychometric characteristics of the Alternate Uses Task have been reported by Kogan (1983) and Runco (1991).

Data Analysis

Interrater reliability among the examiners was assessed using the interclass correlation coefficient with a 95% confidence interval. Descriptive statistics for APS-P and APS-P Extended Version variables were calculated. Analysis of variance (ANOVA and MANOVA) was used to assess the possible effects of preschool vs. primary school children and gender. Partial eta squared was employed to evaluate effect size (Cohen, 1988; Richardson, 2011). Pearson product-moment correlations were calculated to examine the strength of the correlation between the APS–P, APS-P Extended Version, and the Alternate use test. Finally, Confirmatory Factor Analysis (CFA) was carried out on preschool and school-aged children separately. Multi-group confirmatory factor analyses (MCFA) were run with increasing parameter constraints to assess the measurement invariance of APS-P across age. Configural invariance (equivalence of the factorial structure) of the hypothetical model (baseline model) was performed. After that, metric invariance (equivalence of the factor loadings), and scalar invariance (equivalence of the factor loadings and the intercepts of items) were assessed. Measurement invariance was established when (a) BIC showed lower values and change in CFI (ΔCFI) was negligible (<0.01) between increasingly constrained models (b) the other fit indexes of the model indicated a good fit (Vandenberg and Lance, 2000; Cheung and Rensvold, 2002; Chen, 2007; Thienot et al., 2014).

R (R Development Core Team, 2012) Package lavaan (Rosseel, 2012) and the PASW Statistics 18, (SPSS Inc., 2009) were selected to run the analyses.

RESULTS

Inter-rater reliability was calculated on 30 videos (random selection) for the APS-P and 30 for the APS-P Extended Version. Four judges scored independently the 60 protocols according to the manual (Russ, 2004; Kaugars and Russ, 2009). ICCs ranged from a minimum of 0.85 to a maximum of 0.91. The coders then independently scored about 120 protocols each.

Means and standard deviations for APS-P and APS-P Extended Version play scores are presented in **Table 1**. ANOVAS and MANOVAS were performed to examine gender and age-related difference for cognitive and affective scores (**Table 2**).

Gender Differences

A significant effect of gender emerged for Organization with girls ($M = 2.49$, $SD = 0.97$) scoring higher than boys ($M = 2.31$, $SD = 1.01$). Although, gender turned out to be significant also for Elaboration, with girls ($M = 2.45$, $SD = 1.07$) reporting higher values than boys ($M = 2.25$, $SD = 1.12$), the partial eta-squared estimates were low. Thus, only trivial effects, mainly due to the large sample size, can be hypothesized. No significant differences were found for Imagination and Comfort. Referring to affect variables, no significant differences were found for the Total Frequency of Affect Expression neither for the Total Variety of Affect. However, looking at subscales, Frequency of Positive Affect evidenced a larger amount of those themes in girls ($M = 20.15$, $SD = 13.54$) than in boys ($M = 15.90$, $SD = 12.70$). Although, significant, the Frequency of Negative Affect reported negligible value of the partial eta-squared estimate. No significant differences were found for Variety of Positive, as well as Negative Affect.

Age-Related Differences

Significant differences were found for preschool vs. primary school children for Organization, Elaboration, Imagination, and Comfort (**Table 2**), with older children scoring higher than preschoolers (**Table 1**). No significant interactions emerged. Looking at affective scores, significant differences were found for all the variables with preschool children reporting lower number and variety of affective expressions. No significant influences were found for interaction.

Table 3 shows Pearson's correlations between play task (cognitive and affective factors) and measures of divergent thinking. Significant correlations between cognitive and affective scores on the APS-P and APS-P Extended Versions with divergent thinking were found, with the only exception of the Frequency of Negative Affect and the two scores of divergent thinking. In general, children who demonstrated greater abilities in cognitive and affective play abilities showed higher score in divergent thinking (both in Fluency and Flexibility).

However, in line with findings from the MANOVA, correlations were run for preschoolers and school-aged children separately (**Table 3**). Results showed significant correlations, although with low effect sizes, between Fluency and most of the APS-P variables, excepting for Imagination and Variety of Negative affect for preschool children, whereas looking at school-aged children, the only two significant correlations were found for Organization and Comfort. Looking at Flexibility, positive significant correlations were found only for the cognitive scores of APS-P. A similar pattern was seen in older children (APS-P Extended Version), who showed significant positive correlations between Flexibility and Organization, Elaboration and Imagination. No significant correlation emerged between Flexibility and Comfort, as well as the affective scores.

Fit indices of CFAs carried out for preschoolers and primary school children separately reflected a good fit (**Table 4**). Fit indices of the measurement invariance procedure are reported in **Table 4**. The configural model (M1) showed adequate fit, prompting for the equivalence of the factorial structure of the construct across groups. Shifting to metric invariance (M2), the value of the ΔCFI was negligible and the BIC was lower (**Table 4**). However, a different pattern was found when testing for scalar invariance (M3). In this case fit was poor, value of the ΔCFI was greater than the recommended cut off and BIC was higher. Therefore, these findings provided weak evidence of measurement invariance for the two factor theoretical model

TABLE 1 | Descriptive statistics for APS-P and APS-P Extended Version for the total sample, boys, girls, preschoolers and school-aged children.

	Total (N = 538)		Gender				Age			
	M	SD	Boys (n = 261)		Girls (n = 277)		Preschool (n = 239)		School (n = 299)	
			M	SD	M	SD	M	SD	M	SD
Organization	2.40	0.99	2.31	1.01	2.49	0.97	1.89	0.85	2.82	0.91
Elaboration	2.36	1.10	2.25	1.12	2.45	1.07	2.08	1.09	2.57	1.06
Imagination	2.42	0.92	2.41	0.95	2.44	0.90	2.05	0.88	2.72	0.84
Comfort	3.28	0.10	3.20	0.96	3.35	0.85	3.14	0.96	3.38	0.85
Frequency of affect expression	29.90	19.14	28.80	18.69	30.94	19.53	24.70	20.07	34.06	17.31
Positive affect	18.10	13.34	15.90	12.79	20.15	13.54	12.80	11.87	22.31	12.96
Negative affect	7.96	7.90	8.69	8.02	7.27	7.76	6.59	7.92	9.05	7.74
Variety of affect	5.00	2.22	5.05	2.28	4.96	2.18	4.15	2.30	5.70	1.91
Positive variety of affect	2.50	1.06	2.41	1.14	2.57	0.980	2.13	1.17	2.13	1.17
Negative variety of affect	2.50	1.56	2.70	1.54	2.40	1.56	2.02	1.51	2.88	1.47

TABLE 2 | Analysis of variance for gender and age.

		$F_{(1, 534)}$	p	η^2
Organization	Gender	5.33	0.021	0.009
	Age	148.31	<0.001	0.217
Elaboration	Gender	4.19	0.041	0.008
	Age	27.30	<0.001	0.049
Imagination	Gender	0.18	0.673	0.001
	Age	81.47	<0.001	0.132
Comfort	Gender	3.54	0.060	0.007
	Age	9.59	0.002	0.018
Frequency of affect expression	Gender	1.38	0.241	0.003
	Age	33.20	<0.001	0.059
Positive affect	Gender	13.92	<0.001	0.026
	Age	77.44	<0.001	0.127
Negative affect	Gender	4.25	0.040	0.008
	Age	13.51	<0.000	0.025
Total variety of affect	Gender	0.25	0.614	0.001
	Age	73.32	<0.001	0.121
Positive variety of affect	Gender	2.56	0.134	0.004
	Age	63.12	<0.001	0.106
Negative variety of affect	Gender	2.95	0.087	0.005
	Age	44.81	<0.001	0.078

TABLE 3 | Correlations between APS-P, APS-P Extended Version and Divergent Thinking for total sample, preschool, and primary school children.

		Fluency	Flexibility
Total sample ($N = 538$)	Organization	0.23**	0.30**
	Elaboration	0.13**	0.19**
	Imagination	0.13**	0.29**
	Comfort	0.15**	0.17**
	Frequency of affect expression	0.15**	0.10*
	Positive affect	0.16**	0.11*
	Negative affect	0.07	0.07
	Total variety of affect	0.16**	0.16**
	Positive variety of affect	0.12**	0.16**
	Negative variety of affect	0.14**	0.13**
Preschool children ($n = 239$)	Organization	0.16**	0.25**
	Elaboration	0.17**	0.23**
	Imagination	0.07	0.19**
	Comfort	0.15*	0.22**
	Frequency of affect expression	0.27**	0.11
	Positive affect	0.25**	0.06
	Negative affect	0.17**	0.12
	Total variety of affect	0.16**	0.17*
	Positive variety of affect	0.10	0.16*
	Negative variety of affect	0.10	0.16*
Primary school children ($n = 299$)	Organization	0.23**	0.28**
	Elaboration	0.07	0.11*
	Imagination	0.10	0.16*
	Comfort	0.13*	0.10
	Frequency of affect expression	0.01	0.03
	Positive affect	0.05	0.06
	Negative affect	−0.06	−0.05
	Total variety of affect	0.11	0.09
	Positive variety of affect	0.09	0.09
	Negative variety of affect	0.09	0.06

*$p < 0.05$; **$p < 0.01$.

across preschool and school-aged children. In such cases, as suggested by van de Schoot et al. (2012), there is the need to test for partial invariance by freeing one item at the time. According to Dimitrov's (2010) guidelines, <20% free parameters are acceptable, which represent <2 items in the case of the APS-P. Inspection of the modification indices suggested that freeing the intercepts of item 1 (Organization) across groups would provide a better values. Therefore, the partial scalar invariance model (M3a) was run. It showed an adequate fit. Results displayed evidence of partial invariance between the groups showing acceptable values of ΔCFI and a lower BIC value (**Table 4**) between M3a and M2.

DISCUSSION

This study investigated reliability, gender and age-related differences and validity of the APS-P and APS-P Extended Version administered to a community sample of preschool and primary school children. APS-P Extended Version is an extension of APS-P, a measure of preschool children's play, to school age children, aimed to facilitate the comparison of children cognitive and affective interplay components in pretend play.

Although, some significant gender differences were found for some of the cognitive and affective variables, eta squared magnitudes were small, prompting for trivial results. These findings replicated Kaugars and Russ' (2009) research in which they did not find any gender differences. However, significant differences were found between preschool and school-aged children for both the cognitive and affective variables. Elementary school children appeared significantly more able to organize

their play, to design more sophisticated plot, to produce more complex story, and to have higher coherence in the play narrative (Organization). They also appeared significantly more able to use pretend and fantasy to transform a thing as another, to add elements outside of daily experience, to show more novelty of ideas (Imagination). Moreover, preschool and school children differed on the amount of variety and complexity of embellishment in the story themes, facial expressions, toys chosen for play, and character description (Elaboration) with older children scoring higher then youngers, as well as it was found for their comfort in play. Furthermore, school-aged children expressed a significant larger amount of affective expressions (both positive and negative) and used them in a wider variety, suggesting that older children, in line with their development, may have a better knowledge, understanding and expression of emotions then preschoolers (Denham et al., 1994).

TABLE 4 | Test of measurement invariance of the APS-P and APS-P Extended Version across age (N = 538).

	χ^2	df	p	RMSEA	TLI	CFI	ΔCFI	BIC
Baseline model: preschoolers (n = 239)	20.68	8	0.008	0.081	0.985	0.987		
Baseline model: school-aged (n = 299)	23.41	8	0.003	0.080	0.956	0.977		
M1: configural invariance	44.09	16	<0.001	0.081	0.967	0.983		11378.21
M2: metric invariance	64.57	20	<0.001	0.091	0.958	0.976	0.007	11373.54
M3: scalar invariance	162.32	24	<0.001	0.146	0.892	0.914	0.062	11446.12
M3a: partial scalar invariance	101.43	23	<0.001	0.094	0.936	0.967	0.009	11371.53

RMSEA, Root Mean Square Error of Approximation; TLI, Tucker-Lewis Index,; CFI, Comparative Fit Index; BIC Bayesian Information Criterion.

Significant correlations between APS-P and its extended version cognitive and affective scores and divergent thinking were found, showing children with greater play abilities scoring higher in both Fluency and Flexibility. Previous research has already documented that cognitive as well as affective components of pretend play are linked to higher abilities in divergent thinking (Kelly-Vance et al., 2002; Butcher and Niec, 2005; Russ and Schafer, 2006; Marcelo and Yates, 2014). However, results of correlations carried out for preschool and school-aged children evidenced age-related differences. The preschoolers sample showed a larger amount of significant correlations between play abilities (both cognitive and affective domains) and the capacity to generate acceptable uses for one object (Fluency). Delvecchio et al. (2016a), found similar results in their study on children aged 6 to 10 years. No such age-discrepancies were found between APS-P/APS-P Extended Version and Flexibility. Moreover, some of the correlations showed a low effect size. In other words, as expected, external criteria accounted only for a portion of the variance of the cognitive and affective scores but not for the entire relationship.

CFAs results supported the best data fit for the theoretical two-correlated-factor model involving two factors related to cognitive and affective dimensions for both samples. As postulated theoretically by Kaugars and Russ (2009) and empirically by Delvecchio et al. (2016a,b), the cognitive factor was significantly loaded by the four cognitive scores, whereas the affective one by the emotion-related variables (i.e., Total Frequency of Affect Expression and Total Variety of Affect). MCFA showed some evidence of measurement consistency across preschool and school-aged children; metric invariance was partial and obtained after freeing organization variable.

Although, the present study was conducted on a quite large community sample of Italian preschool and primary school children, limitations should be noted. Because this is the first study comparing results on the APS-P and APS-P Extended Version, findings need to be replicated in future research with national as well international groups. Generalizability of the findings is limited to the Italian sample. Cross-cultural studies should focus on similarities and/or differences in play taking into account children's cultural background. Previous studies have already pointed out the importance of specific cultural parenting and educational practices in increasing cognitive or affective expression during pretending (Chessa et al., 2012). However, cross-cultural research on APS-P, comparing samples

from Italy and the US, suggests a quite high correspondence in play abilities across countries (Chessa et al., 2012). One more limitation regards the socioeconomic status that in this sample was medium, although, as suggested by Russ (2004), there is no reason to expect that findings would be different for children of a different socioeconomic status.

Second, the low to medium effect sizes magnitudes of the correlations, although in line with previous findings, warrant further research. Third, external validity was checked just with a creativity measure, so further more studies are needed. However, previous study on APS-P Extended Version in school-aged children showed wider evidences on external validity of the scale (Delvecchio et al., 2016a). Fourth, this study enrolled a sample of non-clinical children. Further studies should be carried out to compare normative and clinical samples of children with different diagnoses. It should be useful to detect possible differences in pretending for different disorders. Fifth, parental and teachers ratings of children's behaviors or affect regulation might also prove useful in future studies. The analysis of different informants' perspectives will enlarge the focus of investigation and provide a more complete picture of the child (Achenbach, 2006).

During the decades play has been considered as a milestone for children growth. Several studies pointed out how play could promote cognitive development, increase creative processes, enhance problem solving, divergent thinking, self-regulation, coping, positive relationships, and can manage social settings to understand the world (Russ, 2004; Bundy-Myrow, 2005; Colwell and Lindsey, 2005; Ferland, 2005; Moore and Russ, 2006; Uren and Stagnitti, 2009). International literature has pointed out how play is an important tool for children's assessment because it emphasizes developmental cognitive, emotional and social acquisitions (Stagnitti, 2004; Russ, 2012). Play is considered an important tool for allowing adaptation and the processing of reality (Capurso and Pazzagli, 2016). However, empirical studies are not yet as well-established as in the clinical and observational tradition (O'Connor and Stagnitti, 2011). Assessment of play along preschool and school age can be useful in longitudinal studies, but also in pre-post intervention with elementary school children with psychological difficulties or disadvantaged backgrounds, where their level of scores could not be foresee. Although, the role of pretend play in longitudinal research and the assessment of pre-post therapeutic interventions has been recognized, emphasized, and empirically studied by several

authors (Russ, 2004; Moore and Russ, 2006; Hoffmann and Russ, 2016) none of these studies adopted the APS-P or APS-P Extended Version. Thus, further research is needed.

In conclusion, the results of this study suggest that APS-P and APS-P Extended Version lead to scores that are reliable, are related to external criteria similarly and have a similar underlying factor structure as the original APS-P scale and are suitable for children from 4 to 10 years old.

AUTHOR CONTRIBUTIONS

ED contributed to conception and design, on acquisition of data and on drafting of manuscript; JL contributed on analysis and interpretation of data; CP contributed on drafting of manuscript; AL contributed to conception and design and revising it critically; CM contributed to conception and design and gave final approval of the version.

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From Research to Clinical Settings: Validation of the Affect in Play Scale – Preschool Brief Version in a Sample of Preschool and School Aged Italian Children

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Affect in Play Scale-Preschool (APS-P) is one of the few standardized tools to measure pretend play. APS-P is an effective measure of symbolic play, able to detect both cognitive and affective dimensions which classically designated play in children, but often are evaluated separately and are scarcely integrated. The scale uses 5 min standardized play task with a set of toys. Recently the scale was extended from 6 to 10 years old and validated in Italy preschool and school-aged children. Some of the main limitations of this measure are that it requires videotaping, verbatim transcripts, and an extensive scoring training, which could compromise its clinical utility. For these reasons, a Brief version of the measure was developed by the original authors. This paper will focus on an APS-P Brief Version and its Extended Version through ages (6–10 years), which consists "*in vivo*" coding. This study aimed to evaluate construct and external validity of this APS-P Brief Version and its Extended Version in a sample of 538 Italian children aged 4-to-10 years. Confirmatory factor analysis yielded a two correlated factor structure including an affective and a cognitive factor. APS-P-BR and its Extended Version factor scores strongly related to APS-P Extended Version factor scores. Significant relationships were found with a divergent thinking task. Results suggest that the APS-P-BR and its Extended Version is an encouraging brief measure assessing pretend play using toys. It would easily substitute the APS-P and its Extended Version in clinical and research settings, reducing time and difficulties in scoring procedures and maintaining the same strengths.

Keywords: Affect in Play Scale-Preschool (APS-P), brief version, children play, tool validation, factor structure

INTRODUCTION

Research and theory on play have recognized that it is a significant activity that promotes children's socio-emotional and cognitive development, enhancing also their psychological adjustment (Morrison, 2001). According to their age, children engage first in functional and exploratory play behaviors, then they shift to symbolic or pretend play (Lillard, 2001; Cartwright, 2004). Pretend play considered children's exploration and interpretation of the world with symbols, fantasy, make-believes, expression of emotions and capacity to explore different circumstances in an imaginary

context. In pretend play, children have also the chance to act out personal inner and social situations facilitating emotional and cognitive understanding of their experiences (Fein, 1987; Moore and Russ, 2006; McAloney and Stagnitti, 2009). As Marcelo and Yates (2014) pointed out, pretend play is a powerful mechanism that includes the interplay of various dimensions, all crucial for a healthy development in childhood. The use of imagination and affects expression is strictly connected with children's gains in cognitive and representational abilities (Bornstein et al., 2002), self-regulation (Berk et al., 2006), coping (Goldstein and Russ, 2000), psychological adjustment, problem solving (Singer and Singer, 1990) and perspective taking (Fisher, 1992; Seja and Russ, 1999). Pretend play is the result of cognitive and affective integration which is responsible for children's development and acquisition of all the abilities reported above (Russ, 2004, 2006).

In order to observe and evaluate these numerous dimensions related to children pretend play, research in this field underscored the need for standardized measures to assess children's cognitive and affective processes that occur together in play sessions (e.g., Russ, 1993, 2004; Kaugars and Russ, 2009). However, studies often devised tools devoted to separately assess cognitive and affective domains in play; moreover, most of these instruments did not define clear standard task or administration procedures (e.g., Gitlin-Weiner et al., 2000; Chessa et al., 2012). To date, Russ (2004) was one of the first authors who tried to satisfy these conditions in devising the Affect in Play Scale (APS), a standardized instrument of pretend play in school-age children (6 to 10-years-old). It consists of a videotaped participants' 5-min play task with two puppets and some colored blocks, scored on cognitive (Organization, Elaboration, Imagination, Comfort) as well as on affective components (the Frequency and Variety of affective themes and Positive versus Negative affective themes) of pretend play. This measure showed good psychometric properties as internal consistency, reliability and validity (Seja and Russ, 1999; Russ, 2004 for a review). A confirmatory factor analysis (CFA) in an Italian sample showed the existence of two correlated factors: a cognitive and an affective one (Delvecchio et al., 2016a). More recently, Kaugars and Russ (2009) validated an adapted form of the APS for children from 4 to 5 years, the Affect in Play Scale-Preschool version (APS-P). Differences between APS and APS-P concerns play material-stuffed toys versus puppets- and instructions, in order to motivate and engage younger children in the play session. Moreover, there are slightly differences also in the coding procedure to better adapt the coding with preschool children way of play (Delvecchio et al., 2016b). Also for APS-P, interrater reliability, internal consistency, as well as internal and external validity resulted robust (Kaugars and Russ, 2009; Fehr and Russ, 2014; Marcelo and Yates, 2014). Fehr and Russ (2014) reported also an exploratory factor analysis on APS-P that included two correlated factors. Delvecchio et al. (2016b) evaluated APS-P external and construct validity in Italian preschoolers. A two-factor model CFA approach led to two correlated factors: a cognitive and an affective one.

Although no theoretical issues might lead to the hypothesis that toys fit better for preschoolers than for school-age children,

and vice-versa, the two version of the scale maintained initially two separated pathways.

Later, APS and APS-P were preliminary compared in the Italian context with the simultaneous administration of the two versions of the scale group of children aged 4-to-10 years (Mazzeschi et al., 2008). No significant differences between the two version of the play task across ages were found, excepting for Comfort: both preschool and school-age children seemed more comfortable with toys than with puppets. Authors suggested that maybe in the Italian culture children are not so familiar with puppets and, moreover, that plastic and stuffed toys might elicit a wider range of emotional expressions (Mazzeschi et al., 2008). Following these preliminary ideas, the extension of APS-P, defined as APS-P Extended Version was firstly validated in a large sample of 6-to-10 years old children and later a study using APS-P and APS-P Extended Version was run to assess pretend to play in preschool and school Italian children aged 4–10 (Delvecchio et al., 2016a,c). Findings of the two studies confirmed the good psychometric properties of this extension and the adequacy of the original APS-P structural model across the ages. The opportunity to have the same set for play session across the ages seems to give a good chance to monitor developmental changes in children assessment and psychotherapy (Cordiano et al., 2008). Moreover, in real life, school-age children use to play with toys similar to the ones proposed in the APS-P task.

Assessment of cognitive and affective abilities in pretend play in preschool and school years should be seen as beneficial for researchers and clinicians (Bergen, 2002; Pellegrini, 2010). The use of APS and APS-P, in its different versions, allowed to include tools devised on an evidence-based approach in the assessment field, since that they are standardized and validated measures of pretend play (Kazdin, 2005; Mash and Hunsley, 2005). Recent attention has been directed toward the development of Brief versions of the APS [Affect in Play Scale–Brief Rating (APS–BR); Cordiano et al., 2008] and the APS-P [Affect in Play Scale–Preschool–Brief Rating (APS-P-BR); Pearson et al., 2008; Fehr and Russ, 2014]. These measures would support and encourage to use play assessment in a wider variety of research and clinical areas because they are less invasive for patients, not requiring videotaping but *in vivo* coding and are easier to use for experts since they do not involve extensive scoring training (Cordiano et al., 2008).

The APS-BR and APS-P-BR and its Extended Version continue to involve the observation of a 5-min standardized play task, with puppets or toys to be used respectively with school and preschool children. Instructions and task prompts are the same of the original measures, except that the instructions for the brief versions do not mention videotaping. Some studies explored psychometric properties, in terms of reliability and validity, of APS-BR (Cordiano et al., 2008) and APS-P-BR and its Extended Version (Fehr and Russ, 2014), in two small samples, comparing the relationship between standard and brief version using both videotaped and *in vivo* coding. The authors of both studies concluded that the APS-BR and the APS-P-BR and its Extended Version strong correlations with the original version

and with external criterion demonstrated that they are worthy measures and might be used in clinical settings in combination or in substitution to the original APS and APS-P. However, the use of two different versions for preschool and school children does not allow the continuity of measure of play across age.

The first aim of this paper was to fill this gap by validating the brief version of the APS-P and its Extended Version in an Italian sample aged 4–10 years. The second aim of this paper was to compare APS-P and its Extended Version, and APS-P-BR and its Extended Version to verify if the brief form would easily substitute the original one while maintaining the integrity of the original scale. Finally, another aim was to contribute to the external validity of the APS-P-BR and its Extended Version by relating the scale with a measure of divergent thinking.

As a preliminary result, interrater reliability was expected to be excellent, since it always resulted so in previous studies on different versions of APS-P in Italy (Delvecchio et al., 2016a,c) and APS-P-BR (Fehr and Russ, 2014). In Fehr and Russ (2014) study on the APS-P-BR and its Extended Version, just an exploratory factor analysis (EFA) was carried out yielding a two correlated factors structure: the first one included organization, imagination, and positive affect and the second one was characterized by undefined affect, comfort, and negative affect. For this reason, the first purpose was to assess the structural validity of APS-P-BR and APS-P-BR Extended Version through CFA, comparing two different models, the classical APS theoretical model (Model 1; Cordiano et al., 2008) and the one proposed by Fehr and Russ (2014) (Model 2). In Model 1, the four cognitive scores are included in the cognitive factor; frequency and positive/negative tone of affective themes load on the affective one; in Model 2 the first factor include organization, imagination, and positive affect and the second one is characterized by undefined affect, comfort, and negative affect. Furthermore, the structural invariance across age groups was investigated by mean of the multiple confirmatory factor analysis (MCFA) approach. Gender as well as age effects were explored. According to previous studies on the different versions of the APS-P, no significant gender differences were expected, however, significant differences were expected between preschool and school age children (Kaugars and Russ, 2009; Delvecchio et al., 2016a,c). It was expected that school-age children score higher both in cognitive and affective variables, demonstrating a higher ability to elaborate and organize their stories and to express a wider range and frequency of affects (e.g., Denham et al., 1994; Stagnitti et al., 2007). The last purpose was to evaluate APS-P-BR and APS-P-BR Extended Version external validity with APS-P and its Extended Version and a measure of divergent thinking, as already used in the original studies. Consistent correlations between corresponding factor scores on the APS-P and its Extended version and APS–P–BR and its Extended Version were expected (Cordiano et al., 2008; Fehr and Russ, 2014). Correlations with divergent thinking were expected significant for both the cognitive and affective factors, although with a medium to low effect size (Russ and Schafer, 2006; Cordiano et al., 2008; Delvecchio et al., 2016a,c).

MATERIALS AND METHODS

Participants

The participants were a community sample of 538 Italian children (261 boys, 277 girls) aged 4–10 years ($M = 6.61$, $SD = 2.20$), recruited in 10 kindergartens and 8 elementary schools in urban and suburban districts in Northern regions of Italy. Participants were homogeneously distributed for gender and age [$\chi^2(6) = 7.98$, $p = 0.23$]. Specifically, 239 children were preschool kindergarten children aged 4–5 years old (44.42%) and 299 children were elementary school children aged 6–10 years old (55.58%). All the children included in the were Caucasian and none of them was repeating the grade. Twelve subjects were immigrants, and their data were not included in the dataset, because of their different ethnic background. Family socioeconomic status was measured using the SES scores by Hollingshead (1975). Eighty percent of the families were middle-class (i.e., SES level 3), 16% came from a high socioeconomic context (i.e., SES levels 4 and 5) and 4% were from economically disadvantaged families (i.e., SES levels 1 and 2).

Procedure

In this study tapes of children play recruited in Delvecchio et al. (2016c) paper were employed, using the APS–P- BR and its Extended Version coding system. A total of 10 raters were employed, all of them already trained in the APS-P and its Extended Version scoring systems. They were then trained on the Brief version scoring according to the original manual (Russ, 2014) and practiced scoring on the same subsample of 40 tapes; then, the raters met with an expert in APS-P BR and its Extended Version coding system in order to discuss any general questions about scoring. Finally, raters were asked to score the scale on play sessions in tapes as they were "*in vivo*" settings, possibly without seeing more than one time each play session. They were allowed to rewind the tape just in the case they did not hear what the child on the tape was saying, simulating a request made to a child to repeat something not heard in an *in vivo* observation. Each rater used the rewind option on 10% of the tapes scored. The research procedure followed the Italian Psychologist Association (AIP) and Helsinki declaration ethical guidelines.

Measures
Affect in Play Scale-Preschool and Affect in Play Scale-Preschool Extended Version
The Affect in Play Scale-Preschool (APS-P; Russ, 2004; Kaugars and Russ, 2009), and its Extended Version (Delvecchio et al., 2016a), are semi-structured 5-min videotaped play tasks, that evaluated assessing affective themes and cognitive dimensions (affect, imagination, organization, and comfort) in children 4-to-10 years old. It is based on empirically validated administration procedure and scoring attribution (Russ, 2004). Children are asked to play with a set of stuffed and plastic toys representing animals (dog, elephant, bear, shark, bunny, camel, cheetah, hippopotamus, and giraffe), and objects (a plastic car, three plastic cups, and a "hairy" rubber ball). The variety of toys is intended to elicit a wide range of emotional expressions such, for example,

sadness or aggression. Each child is introduced by the following instructions: *"That's all the toys in the basket. Now we're going to make up a story using the toys on the table. You can play with the toys anyway that you like and have them do something together, like the bear looking for some food or play house or go to the store. Be sure to talk out loud so I can hear you. The video camera will be on so that I can remember what you say and do. You will have five minutes to play with the toys. I'll tell you when to stop. Now, remember to play with the toys and make up a story"* (Russ, 2004, p. 19). For preschool children, the first part of the instructions are slightly modified to motivate and facilitate the task, and standardized prompts are given. Children are also informed when they have 1 min left to play. Six primary scores are scored using a detailed scoring manual (Russ, 1993, 2004; Delvecchio et al., 2016a) for the APS-P and its Extended Version: Organization, Elaboration, Imagination and Comfort, Variety and Frequency of Affective Themes. The first four scores theoretically refer to the cognitive dimension of the task construction, while the other refer to the affective domain and the emotional expression of play. Cognitive scores are coded on a five-point Likert scale. Organization assesses the complexity of the story, quality of the plot, and coherence of the narrative. Scores vary from a scenario in which disjointed and unrelated events are proposed to the well-integrated plot. Elaboration assesses variety and complexity of embellishment in the stories, use facial expressions or sound effects. Scores varied from very basic stories with no details and with play sessions with embellishment across many dimensions. Imagination assesses fantasy and number of transformations, which makes the story novel and unique. Scores vary from level of absence of symbolism to the presence of many transformations and fantasy. Comfort measures the child's ability to be engaged in the play task, his involvement, and enjoyment in the play session. Scores vary from a reticent attitude during the play and a very comfortable child. In the APS-P and APS-P Extended version, as suggested also by Fehr and Russ (2013), affect scores were assessed through a frequency count. The frequency of Affect Expression counts affects expressed by the child in the play narrative and classifies the content according to 12 different categories including an undefined category added to assess affect expression that does not match with the other ones. Affect is scored both in the case it is expressed in the play (e.g., "Elephant takes care of the bunny") or when affect-laden content is referenced (e.g., "This is a hammer"). Affect scores can be summed to form Total affect, Negative affect (aggression, anxiety/fear, sadness/hurt, frustration/disappointment/dislike, oral aggression, anal) and Positive affect (nurturance/affection, happiness/pleasure, competition, oral, sexual), and scores. The Variety of Affect Score is the number of different affect categories expressed by the child during the play. It can also be summed to form Total affect variety, Positive affect variety, and Negative affect variety scores. Interrater reliability reported excellent values, as well as internal consistency, reported values from satisfactory to excellent for both the versions of the scale (Cordiano et al., 2008; Kaugars and Russ, 2009; Chessa et al., 2011; Fehr and Russ, 2013). CFA of APS-P and APS-P Extended Version showed adequate fit for the two factors solution original model designed by Russ (2004).

The Affect in Play Scale- Preschool Brief Version and its Extended version (Russ, 2004; Fehr and Russ, 2014)

A manual with description of the instructions, prompts, and scores is available (Russ, 2004). To facilitate decision for scoring, brief descriptions of each anchor point are given in the manual. The purpose of the manual was not to overload the rate with many examples that would be difficult to filter through during the observation but to provide a context for scoring the play observation.

APS-P-BR and APS-P-BR Extended Version instructions and their rating scales are based on the ones of the APS-P and its Extended version: while observing the child tapes, the rater scores both the cognitive and affective aspects of his/her play with alterations made for ease of scoring in a live brief rating observation. Five scores were obtained: Organization, Imagination, Comfort, Frequency of Affect, and positive and negative Tone. All dimensions were scored on a Likert scale, ranging from 1 to 4 to avoid "hiding" in the middle (Fishman and Galguera, 2003; Streiner and Norman, 2003), and brief descriptions of each anchor point are given in the manual. A major difference between the original APS-P and its Extended Version and the new APS–P-BR and its Extended Version was the way in which the Frequency of Affect Expression is scored. In the APS-P and its Extended Version, the *Frequency of Affect Expression* score is designed to measure the amount of affect expression, defined in affective units and displayed within the play session. In the APS-P-BR and its Extended Version, instead of a total frequency count, the rater is asked to rate the total frequency of affect on a scale ranging from 1 (*low*) to 4 (*high*) affect expression. The APS–P- BR did not produce a score for a variety of affect categories because the focus was on rating the relative positive/negative tone of the affect expression and not on the specific affect categories. The 11 affect categories are defined just to familiarize the rater with what constitutes a unit of affect expression. Scores can range from *Low* (1; 0–2 affect units) to *High* (4; >15 affect units). In addition, the APS–P-BR and its Extended Version ask the observer to rate the "overall tone of affect in the story, based on the average amount of positive or negative affect expression in the affect units in the child's play." The Tone score on the APS–P-BR and its Extended Version corresponded with the positive and negative affect scores on the original APS-P and its Extended Version. The Tone variable measures the proportion of positive to negative affect expressed in the play and measures the overall affective tone of the story. The tone is based on the estimated amount of positive and negative affect units. The rater is again instructed to keep an estimated tally of the positive and negative affect units. Scores range from predominately negative affect dominating the play (1) to predominately positive affect dominating the play (4). The numeric changes made for the APS–P-BR and its Extended Version do not result in a significant deviation from the conceptual format of the original APS-P and its Extended Version, with the total amount of affect expressed, the tone of the affect expressed, and the quality of the fantasy scored in the play sample.

Alternate Uses Task

Assesses divergent thinking based upon Wallach and Kogan's (1965) adaptation of Guilford's Alternate Uses Task. Children were asked to think of as many alternatives as possible for six everyday life objects (newspaper, button, box, car tire, key, shoe, knife). Two separate scores were calculated (1) Fluency, the number of acceptable uses generated by the child and (2) Flexibility, the number of different categories of use generated by the child. The Alternate Uses Task shows good reliability and validity in many studies conducted with children (Kogan, 1983; Runco, 1991).

Data Analysis

At first, the interrater reliability among 10 raters was assessed on 40 protocols. Interrater reliability was determined using ICC with a 95% confidence interval. A CFA (Maximum Likelihood method) was run to evaluate the structural validity of the APS-P-BR and its Extended Version. Following Van de Schoot et al. (2012) suggestions, those fit indices were considered for model evaluation: Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker–Lewis Index (TLI). The Bayesian Information Criterion (BIC) index was used to compare alternative models In order to test APS-P-BR and its Extended Version measurement invariance across age (preschool versus school-aged children) a MCFA was run. At first, the hypothetical model was assessed on preschool and school-age children separately, after that configural invariance, metric invariance, and scalar invariance were performed. In order to test for evidence of invariance (1) overall model fit, (2) BIC, and (3) change in CFI (ΔCFI) between constrained models were examined. Invariance is supported by the presence of adequate overall fit, lower BIC, and ΔCFI $\leq$ 0.01 between increasingly constrained models (Vandenberg and Lance, 2000; Cheung and Rensvold, 2002; Chen, 2007; Thienot et al., 2014).

After the establishment of the scalar invariance, MANOVA were performed on the APS-P BR and its Extended Version factor mean scores with gender and age as between-subject variables. Pearson's correlations were carried out between factor scores of play tasks and divergent thinking to assess APS-P-BR and its Extended Version external validity. R Development Core Team (2012), Package lavaan (Rosseel, 2012) and the PASW Statistics 18 (SPSS Inc., 2009) were used.

RESULTS

Inter-rater reliability was assessed on 40 randomly selected videos of APS-P and its Extended Version scored with the APS-P-BR and its Extended Version scoring system. Ten independent raters (Ph.D. level and graduate students in clinical psychology), one of which trained by the author of the scale, rated the 40 protocols independently. The average ICCs showed adequate to excellent range: organization: 0.82–0.88, elaboration: 0.86–0.90, imagination: 0.81–0.86, comfort: 0.88–0.94, frequency of affects: 0.84–0.90, and positive/negative tone of affect expression: 0.86–0.89. The remaining protocols were coded independently by the raters (about 50 protocols each).

Means and standard deviations for the total sample, preschool children (4 and 5 years old), school-aged children (from 6 to 10 years old) as well as boys and girls are reported in **Table 1**.

Fit indices comparing the classical APS-P theoretical model (Model 1; Cordiano et al., 2008) and the model proposed by Fehr and Russ (2014) (Model 2) are displayed in **Table 2**. Model 1 included the four cognitive scores loading in the cognitive factor and frequency and positive/negative tone of affective themes loading in the affective one; whereas Model 2 included organization, imagination, and positive affect in the first factor and undefined affect, comfort, and negative affect in the second.

The parsimonious index was lower for Model 1 suggesting that the theory-driven model fits the data more adequately than the Model 2. **Figure 1** displayed the factor loadings of Model 1; they were all significant and comprised between 0.67 and 0.80. The inter-factor correlation between the cognitive and affective factors was 0.82.

Table 3 reports the fit indexes for both preschool and school-aged children as well as the results of the MCFA. Fit indexes referring to the subsample of school-age children showed an excellent fit, as well as for preschool children with the exception of RMSEA that showed slightly higher value than expected. Configural model (M1) indices displayed adequate fit. Looking at the metric invariance (M2), ΔCFI was equal to 0.01 and BIC was lower in comparison to M1 (**Table 3**). Testing for scalar invariance (M3), ΔCFI showed greater value than the suggested cut off and BIC resulted higher than for M2 (**Table 3**). Moreover, M3 showed a poor fit. These findings advocated for a weak measurement invariance of the hypothesized model across preschool and school-aged children. Thus, following Van de Schoot et al. (2012) recommendation, it is suggested to proceed testing for partial invariance by freeing one item at the time. As proposed by Dimitrov's (2010), it is acceptable freeing less than 20% of parameters, which correspond to less than 2 variables for APS-P-BR and its Extended Version. Examination of the modification indices highlighted item 1 ("organization") as the most problematic, suggesting to free its intercepts across groups in order to reach a better fit for the model. Therefore, the partial scalar invariance model (M3a) was run. It showed generally an adequate fit. Results displayed evidence of partial invariance between the groups showing values of ΔCFI below the cut off and a lower BIC value (**Table 3**) between M3a and M2.

The analysis of variance was run to assess age and gender differences. Mean levels of the APS-P-BR and APS-P-BR Extended Version factor scores, for the total sample, preschool and school-aged children, as well as boys and girls, are displayed in **Table 4**.

Results showed that school-aged children scored higher than preschoolers in the cognitive factor ($F_{(1,534)} = 71.29$, $p < 0.001$, $\eta_p^2 = 0.118$) as well as in the affective factor ($F_{(1,534)} = 8.06$, $p < 0.001$, $\eta_p^2 = 0.015$). No gender differences [cognitive factor: ($F_{(1,534)} = 1.83$, $p = 0.176$, $\eta_p^2 = 0.003$); affective factor: ($F_{(1,534)} = 0.08$, $p = 0.774$, $\eta_p^2 = 0.000$)] as well as no interaction effects [cognitive factor: ($F_{(1,534)} = 0.06$, $p = 0.800$, $\eta_p^2 = 0.000$); affective factor: ($F_{(1,534)} = 0.93$, $p = 0.336$, $\eta_p^2 = 0.002$)] between gender and age were found.

TABLE 1 | Means and standard deviations for all the variables of the APS-P Brief and APS-P Brief Extended Version for the total sample, gender, and age (N = 538).

	Overall sample (N = 392)		Gender				Age			
			Boys (n = 261)		Girls (n = 277)		4–5 years (n = 239)		6–10 years (n = 299)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Organization	2.34	0.94	2.28	0.98	2.40	0.91	1.86	0.80	2.73	0.87
Elaboration	2.29	1.00	2.23	1.01	2.36	0.98	2.08	1.02	2.46	0.94
Imagination	2.37	0.88	2.39	0.92	2.36	0.84	2.07	0.88	2.62	0.79
Comfort	3.17	0.79	3.10	0.81	3.24	0.78	3.05	0.87	3.27	0.71
Frequency of affects	3.64	0.77	3.64	0.77	3.65	0.77	3.40	0.96	3.84	0.50
Tone of affect expression	2.92	0.88	2.82	0.89	3.03	0.86	2.83	1.11	3.00	0.63

TABLE 2 | Goodness of fit indices of APS-P Brief and APS-P Brief Extended Version for Model 1 and Model 2.

Goodness of fit indexes categories	Fit indexes	Model 1 (theoretical model)	Model 2 (two factors; Fehr and Russ, 2014)	Good fit	Acceptable fit
Df		8	8		
Satorra–Bentler scaled chi-square		40.31	92.74	$0 \leq \chi^2 \leq 2df$	$2df < \chi^2 \leq 3df$
Descriptive measures of overall model fit	RMSEA	0.078	0.14	$0 \leq RMSEA \leq 0.05$	$0.05 < RMSEA \leq 0.08$
Descriptive measures based on model comparison	TLI	0.958	0.81	$0.95 \leq TLI \leq 1.00$	$0.90 \leq TLI < 0.95$
	CFI	0.977	0.90	$0.95 \leq CFI \leq 1.00$	$0.90 \leq CFI < 0.95$
Descriptive measures of model parsimony	Model BIC	10245.24	14930.32	Smaller than BIC for comparison model	

RMSEA, Root Mean Square Error of Approximation; TLI, Tucker–Lewis Index; CFI, Comparative Fit Index; BIC, Bayesian Information Criterion.

Correlations between APS-P-BR and APS-P-BR Extended Version factor scores and the factor scores of the divergent thinking measure were all significant (**Table 5**). However, different patterns emerged. APS-P-BR and its Extended Version cognitive factor showed higher positive correlations with both the cognitive and affective factors of APS-P and its Extended Version, whereas the affective one displayed a medium correlation with the cognitive APS-P and its Extended Version factor and a lower value for the affective one. In line with what expected, fluency and flexibility (divergent thinking) showed significant positive correlations with both cognitive and affective domains of play.

DISCUSSION

This paper evaluated the construct and external validity of this APS-P-BR and its Extended Version through age, in a wide sample of preschool and school age Italian children. The coding system of the brief version of the APS-P was applied to the videotapes of children play sessions recruited in the Delvecchio et al. (2016a) study, in which APS-P and its Extended Version standard procedure was administered. CFAs results supported the best data fit for the theoretical two-correlated-factor model with one factor related to cognitive dimension and one factor to affective dimension (Cordiano et al., 2008; Kaugars and Russ, 2009). Previous papers focusing

on the original form of the APS-P and its Extended Version in Italian children confirmed empirically the same structure, both for preschooler and school-age children (e.g., Delvecchio et al., 2016a,c). On the same direction, MCFA showed some evidence of measurement consistency across preschool and school-aged children; metric invariance was partial and obtained after freeing organization variable. Although most of the fit indices confirmed this adequacy, some others did not, advocating for further studies on structural validity and metric invariance of APS-P-BR and its Extended Version. Moreover, though Fehr and Russ (2014), run an EFA on APS-P-BR in USA, as far as we know, this was the first attempt to conduct a CFA on the APS-P-BR and its Extended Version. As for age, significant differences were found for both cognitive and affective factors. As expected, also for the APS-P-BR and its Extended Version school-age children reported higher scores then preschooler (Kaugars and Russ, 2009; Delvecchio et al., 2016a,c). This finding is in line with previous literature on play, which underlined how older children showed a more sophisticated way of play, in terms of their abilities to structure and organize their stories and to comprehend and express a wider range of affective themes (e.g., Stagnitti et al., 2007). According to gender, no significant differences were found for the cognitive and the affective factors. These findings were in line with expectations and with Kaugars and Russ' (2009) and Delvecchio et al. (2016a) studies in which no gender differences emerged.
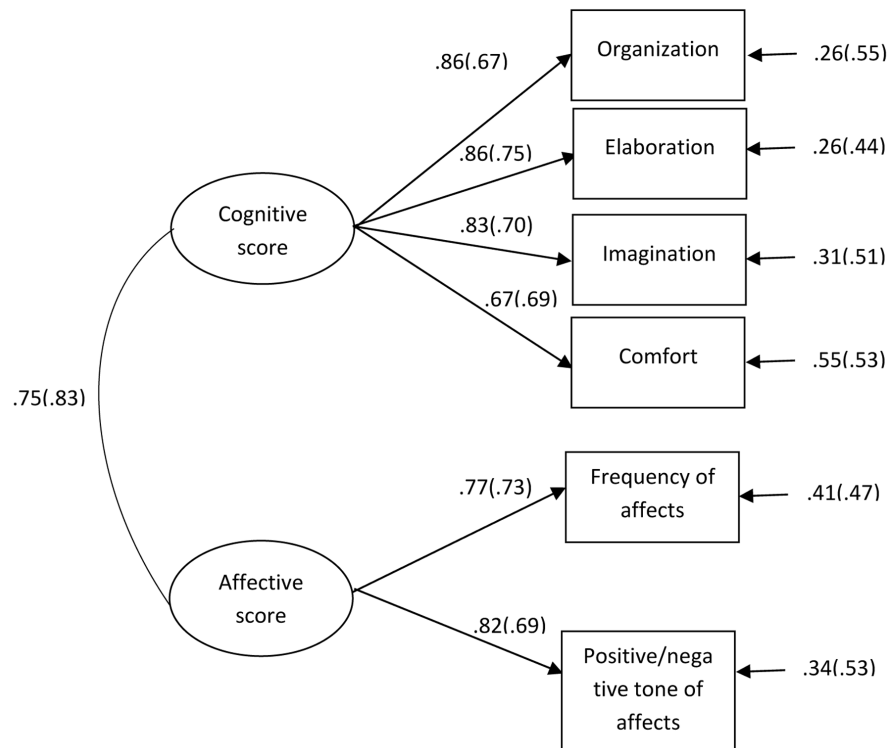
FIGURE 1 | Dimensional structure of APS-P Brief and APS-P Brief Extended Version, Model 1. APS-P Brief Extended version values are in brackets.

TABLE 3 | Test of measurement invariance of the APS-P Brief and APS-P Brief Extended Version across age (N = 538).

	χ^2	df	p	RMSEA	TLI	CFI	ΔCFI	BIC
Baseline model: preschoolers (n = 239)	25.23	8	0.001	0.095	0.958	0.978		
Baseline model: school-aged (n = 299)	21.08	8	0.007	0.074	0.957	0.977		
M1: configural invariance	46.30	16	<0.001	0.084	0.957	0.977		10066.76
M2: metric invariance	64.66	20	<0.001	0.091	0.950	0.968	0.009	10059.55
M3: scalar invariance	152.35	24	<0.001	0.141	0.880	0.904	0.064	10122.29
M3a: partial scalar invariance	84.41	23	<0.001	0.092	0.946	0.958	0.010	10048.44

RMSEA, Root Mean Square Error of Approximation; TLI, Tucker–Lewis Index; CFI, Comparative Fit Index; BIC, Bayesian Information Criterion.

TABLE 4 | Means and standard deviations for the APS-P Brief and APS-P Brief Extended Version Cognitive and Affective factors for the total sample, gender, and age.

	Overall sample (N = 538)		Gender				Age			
			Boys (n = 261)		Girls (n = 277)		Preschool (n = 239)		School-age (n = 299)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Cognitive factor	0.01	0.68	−0.04	0.69	0.04	0.67	−0.26	0.69	0.21	0.59
Affective factor	0.01	19.61	0.31	18.68	−0.29	20.49	−2.64	20.85	2.11	18.33

As expected, significant correlations between cognitive and affective factors of the brief version of the APS-P and its Extended Version and the correspondent factors of the original version were found (Cordiano et al., 2008; Fehr and Russ, 2014). However, while observing correlations patterns in detail, Cohen's d was high for the one between the two cognitive factors, instead it was low for the correlation between the affective factor of the brief version and of the original one. This data suggests that the coding systems of APS-P-BR and its Extended Version and APS-P and its Extended Version for cognitive variables are substantially able to detect the same aspect of play, maybe because the scoring of the four cognitive variables consists of a

TABLE 5 | Correlations of the APS-P-BR and its Extended Version with APS-P and its Extended Version and divergent thinking.

		APS-P and its Extended Version		Divergent Thinking	
		Cognitive factor	Affective factor	Fluency	Flexibility
APS-P-Br and its Extended Version	Cognitive Factor	0.949**	0.383**	0.231**	0.288**
	Affective Factor	0.848**	0.095*	0.109*	0.235**

$**p < 0.001$; $*p < 0.05$.

global score. In this case, the possibility to rewind the tape in the APS-P and its Extended Version does not add information about the cognitive scores that can be easily detected also in the *in vivo* coding. On the other hand, the affective variables could be affected by the possibility to watch the tape more than one time. The affective variables score is based on counting each word, expression or object in the story conveying affective themes, and during the *in vivo* coding some of them can be lost. Moreover, it is interesting to note that the APS-P-BR and its Extended Version cognitive factor correlates with high Cohen's d with both cognitive and affective factors of the APS-P original version and its Extended Version, showing also a correlation between cognitive factor of the brief version and affective factors of both brief and original version of APS-P and their Extended Version. On the other hand, APS-P-BR and its Extended Version affective factor showed medium correlations with both cognitive and affective factors of the APS-P original version and its Extended Version, confirming that the affective factor has a quite different trend in the brief version, for the reasons hypothesized before. Significant positive correlations between APS-P-BR and its Extended Version cognitive and affective factors and divergent thinking were found. Children with higher scores in cognitive and affective components of play reported higher score in both Fluency and Flexibility. The same pattern was found in studies involving the APS-P original version and its Extended Version, suggesting that both cognitive and affective dimension of pretend play are associated with improved divergent thinking skills (e.g., Russ and Schafer, 2006; Marcelo and Yates, 2014; Delvecchio et al., 2016a).

This paper contributes to the validation of APS-P-BR and its Extended Version, a measure that would encourage the use play assessment in a wider variety of research and clinical areas, not requiring videotaping. This aspect makes the measure less invasive for patients, also increasing their confidentiality. Results suggest that APS-P-BR and its Extended Version through age, is a reliable and valid measure in terms of construct and external validity, retracing the main results obtained also in the APS-P and its Extended Version (e.g., Kaugars and Russ, 2009; Delvecchio et al., 2016a,c).

The APS-P-BR and its Extended Version do not completely overlap the original form, especially for the affective dimension. As discussed before, the affective factor of the brief version did not exactly retrace the one of the original version. So, on the one hand, the APS-P-BR and its Extended Version could be easily used in clinical settings, not requiring videotaping, on the other hand, APS-P and its Extended Version could be more suitable to have a complete affective profile of the play session. For sure the APS-P-BR and its Extended Version is a promising tool for

assessing children pretend play that would easily substitute or, in some cases, used together with the APS-P and its Extended Version through age.

The present study showed also some limitations. First, APS-P-BR is not administered directly to children, but its scoring system was applied to tapes of children play sessions following APS-P and its Extended Version standard procedure. Future studies need to be carried out using APS-P-BR and its Extended Version procedure and without videotaping. Then, raters who scored the tapes with the brief version procedure were already familiar with the APS-P and its Extended Version coding system. This aspect could have affected their way of scoring in terms of make the two coding processes more similar. Then, although the study involved a large sample of children from 4 to 10 years old, generalizability is limited to non-clinical sample and to Italian culture, stating that culture could affect children way of play (Chessa et al., 2012). Future research should involve different kinds of clinical and cross-cultural samples. Finally, APS-P- BR and its Extended Version affective factor would need specific attention. Training should deepen the scoring system of affective variables of the brief version because they seem to require a moderate amount of time to be practiced. Expertise in play session scoring resulted strictly connected with an increasing availability of the raters and accuracy in detecting cognitive, but primarily, affective variables. Future development of the APS-P-BR and its Extended Version scoring procedure could include an affective theme checklist the raters could use during the *in vivo* administration to be guided in detecting the highest numbers of affective themes.

ETHICS STATEMENT

Comitato Etico Area 17, Università degli Studi di Padova. As explained in the manuscript, in these studies videotapes of already recruited children play sessions were coded. Following, I reported the consent procedure used for the original recruitment. This study was conducted in compliance with the ethical standards for research outlined in the Ethical Principles of Psychologists and Code of Conduct (American Psychological Association, 2010). Participation in the study was solicited via leaflets. School approval and parents written signed informed consent to participate in the study were obtained before data collection. Children were asked to provide their own oral consent. No incentives were awarded and voluntary participation was emphasized. Administration was proposed during scheduled classes, according to the standard administration procedures. Confidentiality was assured by replacing children's personal

information with a numeric code. According to their teachers, all children were developing typically. Before starting the task, preschoolers' cognitive and verbal abilities were assured by the WPPSIIII (Wechsler, 2008) vocabulary and bloc design subtests. A score equal or greater than was required in order to participate in the study. At the same time, for school -aged children, cognitive and verbal abilities were confirmed by teachers' reports on the basis of Italian language and maths tests.

AUTHOR CONTRIBUTIONS

DDR supervised the rater who coded the videotapes. She wrote the theoretical introduction and the discussion of the results. SS supervised the objective/hypothesis and procedure sessions. AL supervised the sample recruitment and the discussion of the results. ED supervised the sample recruitment and carried out statistical analysis.

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Models of Disability in Children's Pretend Play: Measurement of Cognitive Representations and Affective Expression Using the Affect in Play Scale

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Play is a natural mode of children's expression and constitutes a fundamental aspect of their life. Cognitive, affective, and social aspects can be assessed through play, considered as a "window" to observe a child's functioning. According to Russ's model, cognitive and affective components and their reciprocal connections can be assessed through the Affect in Play Scale (APS). The aim of the present study was to investigate children's representations of the three main models of disability (medical, social, and biopsychosocial) and how these models affected cognitive and affective components of children's play. Sixty-three children, aged 6–10 years, were assessed by means of the APS. Participants were randomly assigned to one of two APS task orders: the standard APS task followed by the modified APS task (including a wheelchair toy), or vice versa. The standard and modified APS sessions were coded according to the APS system. The modified APS sessions were also coded for the model of disability expressed by children. A one-way ANOVA conducted on the APS affective and cognitive indexes revealed an effect of condition on the affective components of play and no effect on cognitive components and variety of affect as assessed by the APS. In addition, when children are involved in pretend play from which concepts of disability emerge, these concepts are almost exclusively related to the medical model of disability. Results suggested implications for intervention with children in educational contexts that aim to teach children about disability.

Keywords: models of disability, play of children, pretend play, affect in play scale, medical model, social model, ICF, causal origins of disability

INTRODUCTION

Play is a natural mode of expression of children and constitutes a fundamental aspect of children's life (Nicolopoulou, 1993). Play can be considered a window through which one can observe a child's cognitive, affective, and social functioning (Stagnitti, 2004). In particular, pretend play is a complex behavior involving symbolic expression of thoughts and feelings (Cherney et al., 2003; Russ, 2004). Recent evidence indicates that pretend play has important connections to the development of cognitive, affective, and social skills (Pellegrini and Smith, 2005). These connections make pretend play an important phenomenon to study, due to its capacity to provide insight into

children's abilities and internal representations (Niec and Russ, 2002) and its appropriateness for investigating the "architecture" of the child's mind (Weisberg, 2015).

In order to grasp the complexity of play, it seems necessary to evaluate it in terms of the dimensions of pleasure expressed, contents/themes, and linguistic and structural aspects, through a meaningful theoretical and methodological model founded on evidence-based procedures (Lewis J. M., 1993; Mash and Hunsley, 2005).

Russ developed a model of pretend play and a scale to measure the play of children from 6 to 10 years old, the Affect in Play Scale (APS) (Russ, 1993, 2004). The APS qualitatively and quantitatively assesses affective and cognitive components of symbolic play, through the use of a standardized coding system that allows for measuring affective dimensions in fantasy and cognitive dimensions of play.

In the present study, Russ's (2004, 2014) model, and its related APS, were used to evaluate the implicit component of the child's internal representations of disability in the context of symbolic play. The APS had never before been used to evaluate fantasy and expression of affect in symbolic play involving characters with a disability. A modified version of the APS play task was used by introducing a toy wheelchair among the standard play task materials which could be worn by a puppet to represent a character with a disability.

To date, the scientific literature has identified three main models of disability: individual (including the medical model), social, and biopsychosocial (Bickenbach et al., 1999; World Health Organization [WHO], 2001). The individual model posits that disability is a direct consequence of disease, trauma, or other health conditions and, hence, that disability is an individual problem. In other words, it represents an individual-level deviation from biomedical norms of structure or function that requires medical care and treatment from health professionals (Boorse, 1975, 1977; Bickenbach et al., 1999; Pompili et al., 2013). Since treatment by the medical profession is central to this model, it is also referred to as the medical model of disability (Finkelstein, 1980; Oliver, 1981, 1996; World Health Organization [WHO], 2001). Unlike the individual model, the social model portrays disability as a cultural construct, the product of a particular social environment (Oliver, 1990; Roulstone et al., 2012). Physical barriers or social attitudes are considered the origin of disability, because they prevent individuals with a "disability" from gaining access to virtual and real spaces and make social participation difficult. In this model disability is not an individual attribute, but rather a complex collection of conditions which require social actions rather than just medical treatment (World Health Organization [WHO], 2001). Finally, since 2001 the *ICF: International Classification of Functioning, Disability and Health* has used a biopsychosocial—also known as interactive (Bickenbach, 2012)—model of human functioning and health, which represents an attempt to integrate the conflicting medical and social models. To achieve this "synthesis" (World Health Organization [WHO], 2001), disability is treated not as a consequence of disease but as the outcome of three variables related to human health: health status, environment, and personal factors. In **Table 1**, the main concepts of the three models of disability were summarized.

Disability is a complex phenomenon and models of disability allow people to make sense of emotional responses to disability, to process thoughts and structure knowledge about disability, and to make decisions and judgments to which it is relevant (Brewer, 1999). Children's models of disability were first studied by Meloni et al. (2015), who reported that the youngest group of children (6–8 years old) thought of people with disabilities as being sick. This early representation of disability is consistent with the individual model of disability and was independent from parents' explanations and representations of disability. Older children (9–11 years old) had more knowledge of disability and endorsement of stereotypical beliefs tended to be lower, as children tended to espouse their parents' representations.

Research based on Piagetian stage theory (Piaget, 1929, 1952, 1954) claimed that young children's difficulty in conceptualizing disability was the result of their being too cognitively immature (Lewis A., 1993; Lewis, 1995; Glasberg, 2000). According to these approaches, children can only process and structure knowledge about disability across a range of explanations for disabilities identifiable among the three main models of disability, which include physical, biological, and psychological causes of disablement and health, when they reach approximately 11 years of age. Although debates continue, studies of cognition in infancy demonstrate that knowledge begins to emerge early in life and constitutes part of humans' innate endowment (Baillargeon et al., 1985; Spelke, 1994; Baillargeon et al., 1995), even including an early understanding of disease causality (Springer and Ruckel, 1992; Sigelman et al., 1993). In line with this work, challenging Piagetian framed research on children's knowledge of illness causation, Smith and Williams (2004) explored children's understanding of the causal origins

TABLE 1 | Summary of the concepts of the tree main models of disability.

Model of disability	Causes of disablement	The model's focus	Interventions
Medical/Individual	Consequences of disease or disorder	Sick individual who requires medical treatments provided by health professionals	Rehabilitative to "fix" the sick individual
Social	Social barriers	Cultural stereotypes, medical norms, and environmental hindrances	Political and cultural to break down social barriers
Biopsychosocial	Components of health (health structures and functions, personal and environmental factors)	Human beings functioning in their context	Shaping the health system to meet the individual's functioning needs, and minimizing social barriers

of disabilities. They found that children of all ages showed a preference for physical and biological causes of disability (consistent with an individual/medical model) and rejected social–psychological causal explanations (consistent with a social model).

The aim of the present paper was to explore the type of representation of disability and the effect of the presence of a disabled character on the expression of affect and on the cognitive dimensions of children's play. In accordance with previous findings (Smith and Williams, 2004; Meloni et al., 2015), we expected that, when one of the two puppets in the modified APS play task was in a wheelchair (disabled puppet), children would tell stories in which the psychological constructs, sequence of actions, and affective expressions were consistent with the individual/medical model of disability. We also expected that pretend play with a disabled puppet would display a strong connection between affective categories such as nurturance/affective and sadness/hurt and actions such as providing and receiving care.

MATERIALS AND METHODS

Participants

Thirty Italian 6- to 10-year-olds were recruited from a public primary school. All of them were Caucasian, attending mainstream classes and had no declared disability, and sixteen (53.3%) were female. Parents provided written, informed consent to their children's participation in the study and to the videotaping of their children in the play session. All the children also consented personally after the researcher explained that he or she would like to watch the child playing with two puppets for a few minutes. The Ethics Committee of the Department of Philosophy, Social and Human Sciences and Education at the University of Perugia reviewed and approved the study. The study presented "no more than minimal risk".

Instrument

The standard APS (Russ, 2004) is a standardized instrument for evaluating cognitive and affective dimensions in pretend play in children from 6 to 10 years of age, based on an observational procedure that focuses on different children's behaviors during a semi-structured, 5-min, evidence-based play task. The APS has been employed in numerous studies that have demonstrated its good psychometric characteristics. Good inter-rater reliability was achieved, with Cohen's kappa values ranging from 0.70 to 0.90 (Russ, 2004). The APS play task is video recorded and requires two neutral-looking hand-puppets, representing a boy and a girl, and some little wooden blocks. The instructions are standardized and facilitate the child playing freely, according to his or her skills, age, characteristics, and preferences. The researcher introduces the two puppets and the blocks to the child and asks him or her to play with them for five minutes.

The modified APS, an adapted APS play task procedure, was developed for this study and involved changes to the APS materials and instructions. The modified APS play task included a wheelchair toy in addition to the two puppets and the blocks.

The experimenter introduced the wheelchair toy (wearable by one puppet) and asked the child which of the two puppets (boy or girl) was disabled and which was not.

Henceforth, the terms "standard APS" and "modified APS" are used to refer, respectively, to the original instrument (Russ, 2004) and to the version developed for this study.

A semantic discrimination task (Meloni et al., 2015) was administered to assess children's comprehension of the concept "disabled." The child was presented with six stimuli (2 photographs of people with disabilities; 2 photographs of people without disabilities; 2 words: "handicapped" and "normal") and asked sort them by placing them in one of two labeled baskets. The baskets were labeled "disabled" and "normal." A child was considered to have passed the test if he or she demonstrated understanding of the difference between the semantic categories represented by the stimuli. The test was repeated until the child had either demonstrated that he or she could correctly discriminate between the stimuli or it was clear that he or she was unable to do so.

Measures
The APS Rating Scale

The APS rating scale (Russ, 2004) was used to analyze the standard and the modified APS play tasks. The APS scores used in the present study belong to two domains: affective and cognitive.

Affective domain:

(1) *Total Frequency of Affective Expressions score*: is measured by the sum of eleven affective categories (happiness/pleasure, nurturance/affection, oral, sexual, competition, anxiety/fear, sadness/hurt, frustration/disappointment, aggression, anal, and oral aggression). The categories can be applied to verbal or nonverbal expressions, and can be an affect state ("This is fun") or an affect theme ("This bomb is going to explode").

(2) *Frequency of Positive Affect score*: sum of the five affect categories: happiness/pleasure, nurturance/affection, competition, oral, and sexual.

(3) *Frequency of Negative Affect score*: sum of the six affect categories (aggression, sadness/hurt, anxiety/fear, frustration/disappointment, oral aggression, and anal).

(4) *Variety of Total Affect Categories score*: is a count of affect expressions across the 11 possible categories.

(5) *Variety of Positive Affect Categories*: is a count of affect expressions across the five positive categories.

(6) *Variety of Negative Affect Categories*: is a count of affect expressions across the six negative categories.

Cognitive domain, rated on a five-point Likert-type scale:

(1) *Organization*: includes the quality and the complexity of the play plot.

(2) *Elaboration*: measures the amount of embellishment in the play in terms of theme, facial expression, voice tones and character development.

(3) *Imagination*: involves number of ideas, novelty, and fantasy of the play in terms of the presence of themes outside of everyday experience.

(4) *Comfort*: rates the child's overall level of enjoyment engaging in pretend play and her ability to be involved in play.

Representation of Disability

Representation of disability was only scored for the modified APS. Expressions were classified assigning them to one of three categories of disability model (medical, social, and biopsychosocial), as follows.

(i) Individual/Medical Model

Statements in which the disability was related to the health of the disabled puppet. This category also included statements on impairments assigned to the disabled puppet. This category includes: (i) all statements implying that the disabled puppet (i.e., puppet in the wheelchair) was considered morally or ethically responsible for his or her disability; (ii) any judgment based on the appearance of the disabled puppet, e.g., beauty, or ugliness; (iii) any statement assigning responsibility for the disability to an external spiritual, vital, or religious force.

(ii) Social Model

All statements that attributed the disability to factors beyond control of the disabled puppet, such as architectural and cultural environmental factors (barriers, rules, regulations, etc.), or to human attitudes and prejudices.

(iii) Biopsychosocial Model

As the biopsychosocial model is a composite, we included in this category articulations attributing disability to a complex interaction of medical, environmental, and socio-relational factors, including a clear reference to individual functioning (health or disease).

Procedure

Administration Procedure

After a parent had provided written, informed consent for his or her child's participation, the researcher explained to the child that he or she would like to learn about play by watching the child play with the two puppets for a few minutes and asked for the child's own consent to this. All children were assessed individually.

First, the semantic discrimination task was administered to assess comprehension of the concept "disabled." Then, children were invited to play using both the standard APS and the modified APS play task sequentially. The two sessions (standard and modified) were administered consecutively and were videotaped. The procedure lasted roughly fifteen minutes (5′ semantic discrimination task; 5′ standard APS; 5′ modified APS).

Coding Procedures

Recordings of the two play sessions (standard and modified) were transcribed verbatim and the video recordings scored, using the APS scoring system procedure (Russ, 2004), by two independent trained coders. The modified APS play task verbatim transcriptions were also scored by two independent trained coders. The score for each disability model (individual/medical, social, biopsychosocial) is obtained by summing the child's expressions attributable to each model. Inter-rater reliability was assessed using the Pearson correlation coefficient on 20 randomly selected protocols. The correlations between the two judges for all the scores ranged from 0.87 to 0.94.

Data Analysis

Descriptive statistics (mean, *M*; standard deviation, *SD*) were calculated to provide a profile of the sample. Inferential statistics (multivariate ANOVA and univariate ANOVA) were used to compare children's play performance on the standard APS and modified APS, and *t*-tests for unpaired samples and effect sizes for Student's *t*-test (Cohen's *d*) were calculated to compare children's play performance on the standard APS with normative Italian data. Chi-square tests were used to explore the association between children's gender and models of disability, and correlational analysis was used to explore the association between children's age and models of disability. Data were analyzed using IBM®SPSS Statistics 23.

RESULTS

Sample

Fifty-five out of 63 primary school pupils invited to play completed the experiment (male: $n = 28$, 50.9%; female: $n = 27$, 49.1%; *M* age = 8.10 years, *SD* = 1.45, range: 6–10) (**Table 2**). Eight pupils stopped playing during one or both of the 5-min task periods, not playing after a 2-min period. For this reason, the people pupils were excluded from the analyses.

Twenty-five pupils played with the standard APS play task first.

Affective and Cognitive Components in the Standard APS Play Task

Results for the APS standard condition are reported in **Table 3**. Values available from the normative Italian sample are reported in parentheses (Mazzeschi et al., 2016).

In order to compare children's play performance on the standard APS with normative Italian data, *t*-tests for unpaired samples and effect sizes in terms of Cohen's *d* were calculated.

TABLE 2 | Sample profile: school grade and gender.

Grade	Male N	Male %	Female N	Female %	Total N	Total %
I	4	14.3	6	22.2	11	18.2
II	5	17.9	7	25.9	12	21.8
III	5	17.9	5	18.5	10	18.2
IV	5	17.9	4	14.8	9	16.4
V	9	32.1	5	18.5	14	25.5
Total	**28**	**100**	**27**	**100**	**55**	**100**

TABLE 3 | Means and standard deviations for the sample.

	Frequency		Variability	
	M	*SD*	*M*	*SD*
Total Frequency of Affective Expressions	14.83 (12.61)	12.99 (11.79)	3.38 (3.38)	2.64 (2.21)
Frequency of Positive Affect	10.73 (7.63)	9.98 (8.53)	1.88 (1.74)	1.33 (1.28)
Frequency of negative Affect	4.11 (4.96)	4.78 (6.31)	1.58 (1.64)	1.67 (1.32)
Aggression	0.55 (1.50)	1.24 (3.71)	0.22	0.42
Nurturance/affection	1.35 (1.14)	2.06 (1.81)	0.42	0.49
Happiness/pleasure	6.50 (4.12)	5.36 (5.17)	0.75	0.44
Anxiety/fear	0.63 (0.76)	1.16 (1.87)	0.29	0.46
Sadness/hurt	0.78 (1.05)	1.62 (2.24)	0.33	0.47
Frustration/disappointment	1.22 (1.34)	2.27 (2.09)	0.39	0.49
Competition	0.36 (0.68)	1.42 (2.29)	0.09	0.29
Oral	2.11 (1.45)	4.53 (3.44)	0.36	0.48
Oral aggression	0.25 (0.08)	0.93 (0.47)	0.09	0.29
Anal	0.51 (0.25)	1.17 (0.91)	0.22	0.42
Sexual	0.36 (0.25)	1.11 (1.13)	0.13	0.34
Organization	2.42 (2.32)	1.28 (1.15)	–	–
Elaboration	2.36 (2.21)	1.27 (1.03)	–	–
Imagination	2.35 (2.21)	1.04 (1.03)	–	–
Comfort	2.73 (2.96)	1.31 (1.05)	–	–

In parenthesis are data from the normative Italian sample.

According to Cohen (1988), effect size values of 0.2, 0.5, and 0.8 are considered small, medium, and large. The comparison with data from the Italian normative sample indicated that, for the standard APS play session, children in the present sample displayed typical play, similar to the normative samples in all of the APS scores. The only two exceptions to this trend were the Frequency of Positive Affect ($t = 2.61$, $df = 1264$, $p < 0.01$, $d = 0.333$) and the happiness/pleasure category ($t = 3.33$, $df = 1264$, $p < 0.01$, $d = 0.452$). Both Cohen's d results were of a medium size.

Affective and Cognitive Components in the Modified APS Play Task

A one-way ANOVA of the frequency of the 11 affect categories revealed effects of APS condition on one category of positive affect, "nurturance/affection" [$F(1,110) = 11.98$, $p = 0.01$, $\eta^2 = 0.100$], and one category of negative affect, "sadness/hurt" [$F(1, 110) = 9.82$, $p < 0.01$, $\eta^2 = 0.083$]. An effect size measured using partial $\eta2$ of 0.01 constitutes a small effect, 0.06 a medium effect, and 0.14 a large effect. Both affect categories were more frequent in the modified APS condition (nurturance/affection: $M = 3.93$, $SD = 5.13$; sadness/hurt: $M = 2.49$, $SD = 3.71$). There was no effect of APS condition on cognitive components (Organization, Elaboration, Imagination and Comfort) and on variety of affect.

Children's Models of Disability

During the modified APS session, 29 out of 55 pupils expressed concepts relevant to a disability model (i.e., occurrence of a disability model). Twenty-six out of those 29 pupils only represented disability through the medical model, two through

the medical and social models, and one through only the social model. None of the pupils used the biopsychosocial model. Amongst the 29 pupils who referred to disability in the modified APS session, the mean frequency of statements related to the medical model was 2.07 ($SD = 1.28$), while the mean frequency of mentions of the social model was 0.27 ($SD = 0.92$). Chi-square tests indicated that there was no relationship between gender and mentions of a disability model [$\chi^2(1, N = 29) = 0.31$, $p = 0.58$] and no relationship between gender and the relative frequency of the various disability models [$\chi^2(5, N = 29) = 5.11$, $p = 0.40$].

There was a correlation between age and mentioning at least one model of disability [$r(55) = 0.27$, $p < 0.05$]. There was no relationship between puppet gender and child's assignment of puppet to the wheelchair in the modified APS.

Finally, **Table 4** shows which puppets were worn by children before starting timing of the two APS sessions (the child must put on the puppets before timing the session; Russ, 2004). Only one child wore the puppet with the wheelchair: 54 children never wore the puppet with the wheelchair freely (i.e., before the experimenter invited him or her to put on) (**Table 4**).

A one-way ANOVAs on puppet wearing (1 = wearing neither; 2 = wearing both; 3 = wearing only one (non-disabled)) revealed an effect of APS condition (standard APS; modified APS) on puppet wearing, $F(1,110) = 11.86$, $p = 0.01$.

DISCUSSION

In line with previous studies (Nichols and Stich, 2000; Singer, 2002), the present paper claims that pretend play is a fundamental tool for investigating children's affective, cognitive, and social functioning. Studying children's pretend play can also provide

TABLE 4 | Puppet wearing in the standard and modified APS play tasks.

Puppet(s) worn	Standard APS	Modified APS
Neither	16	20
Both	37	1
One (not-disabled)	2 (Males)	34 (male n = 15; female n = 18)
One (disabled)	–	0

insight into human cognitive architecture and its development (Weisberg, 2015).

With regard to the affective and cognitive components, children showed a play profile in line with Italian norms, playing in a typical way for their age (Mazzeschi et al., 2016). Children showed more expressions of empathy or sympathy and helping or supporting with another character (nurturance/affection) and more expressions of pain, sadness, or loneliness (sadness/hurt) when playing with the wheelchair toy (modified APS play task).

The organization and elaboration of the play plot and the child's imagination and comfort in play, namely the cognitive components of the APS (Chessa et al., 2011), remained quantitatively unchanged across the experimental conditions (standard and modified APS play tasks). Disability—suggested by the introduction of the wheelchair toy in the modified APS—did not affect the construction of the structural components of the play plot and children remained available to symbolically play as usual. At the same time, children were shown to be very sensitive to the presence of the wheelchair toy, showing a general attitude of compassion and sadness toward disability. We infer that, from the point of view of the play plot, a wheelchair toy has the same weight as all the other play elements (hand-puppets and wooden blocks), by demonstrating that for a child one toy is like another. On the other hand, the child proves to know the emotional value of the wheelchair, since it is immediately associated with the disease and, therefore, with feelings of care, compassion, and sadness; this explains the variations measured in the affective components of play, but not the cognitive ones.

With regard to the children's models of disability, data confirm the finding of Meloni et al. (2015) that, for children, individuals with disabilities are mainly thought of as being sick. When children are involved in pretend play, from which concepts of disability emerge, these concepts are almost exclusively related to the individual/medical model of disability. As we expected, the children imagine the disabled puppet as sick (e.g., disabled puppet says: "I'm sick because my legs are broken"), or requiring medical treatment (e.g., disabled puppet says: "The physician told me that within few days I'll be better"), and the non-disabled puppet as a provider of health care (e.g., non-disabled puppet says to disabled one: "The physician told that you must take these pills that make you feel better"). These findings were reflected in the higher frequency of nurturance/affection and sadness/hurt in the modified APS condition, as expected.

As a cognitive organizer, a model of disability helps people to identify and understand the causal origins of disability (Meloni et al., 2015). The individual/medical model directs understanding of disability to the physical and biological condition of an individual, rejecting social and cultural determinants of disability.

Therefore, our findings are in line with those of Smith and Williams (2004), who found that 4- to 11-year-old children showed a preference for physical and biological causes of disability and rejected social–psychological causal explanations.

The 26 pupils out of 55 who did not express concepts referable to a disability model were the youngest. It suggests that the capacity to tell stories in which disability is salient develops with age. At an early age, disability does not seem to attract children's attention and is not featured in their stories. When disability is mentioned in a story, however, it emerges as the most salient element and drives the narrative. The disability element in children's stories tends to conform mainly, if not exclusively, to 'schemata' (Brewer, 1999) from the individual/medical model of disability.

That the youngest did not express concepts referable to a disability model highlights what Smith and Williams (2004) suggested with regard to open-ended verbal methods: young children may have been so concerned with spontaneously generating a causal explanation that they were unable to verbalize a cause. In fact, when a forced-choice paradigm is adopted, as in Smith and Williams (2004) and Meloni et al. (2015), young children show some causal knowledge of disabilities.

Another interesting finding related to puppet wearing behavior before starting timing of the two APS sessions. In the standard APS, the majority of children wore both puppets, whereas in the modified APS most children only wore the non-disabled puppet freely. This behavior seems consistent with studies by Park et al. (2003) and Meloni et al. (2012), which demonstrated that disability elicits disgust and, hence, avoidance behavior. As the medical model of disability schematizes an aspect of human diversity by providing a cognitive organizer, such as a "frame" (Minsky, 1975), the avoidance behavior provides a "script" (Schank and Abelson, 1977) as well. No wonder, then, that, despite voicing caring attitudes toward the puppet in the wheelchair, almost none of the children elected to wear this puppet freely.

CONCLUSION

Findings from this study support the validity of the APS to evaluate differences in children's play in different situations, confirming the validity of the scale in showing the affective nuances of the play of school-aged children.

Use of the APS also allowed for confirmation of what previous research on disability representations and attitudes in children aged 6–10 years suggested. In particular, the perceptual salience of disability increases as the age of children grows. In the present study, all children who paid attention to disability tended to only describe and explain it in its biological and physical dimensions, neglecting any social and cultural determinants of disability. Therefore, the perspective of disability emerging from the children's attitudes in the APS play task was fully compatible with the individual/medical model of disability as defined in the scientific literature. This compatibility was further confirmed by the fact that sadness/hurt affect categories prevailed in children's storytelling when they interacted with the disabled character

(puppet in the wheelchair), along with the nurturance/affection category. In fact, the prevalence of sadness/hurt feelings is consistent with the personal tragedy view (Swain and French, 2000) on which the medical model of disability is grounded.

The results obtained also suggest that disability is strongly and stereotypically associated with a negative and unpleasant dimension of existence, providing evidence for a cognitive mechanism underpinning the cultural construction of the individual/medical model of disability. Moreover, according to Smith and Williams (2004) research on children's understanding of the causal origin of disability, our results challenge Piagetian's assumption (Piaget, 1929, 1952, 1954) that young children conceptualize disability with difficulty. Children, indeed, were not surprised by diversity of disability, and demonstrated possession of cognitive schemata to elaborate on it and congruent emotions to respond to it. On the basis of these results, we claim that the child's education about disability should not have the aim to introduce the concept of diversity, but rather to enhance their views on disability, modeling the social and cultural dimensions of diversity among the disabled that seem to be lacking in children.

Future research might overcome some limitations of the present study. These include, for example, increasing the sample size, given that the sample of children recruited in the present study prevents us from generalizing the results as representative of the Italian child population. In addition, in order to better investigate the evolution of the concept of disability, a longitudinal study would be advisable. Finally, the present research reflects the Italian socio-cultural context, where the pressure to include disabled people in social life is a political and legal norm but not yet widespread in the social fabric. It would be interesting to see how the disability models feed children's narratives on disability in other socio-cultural contexts.

AUTHOR CONTRIBUTIONS

Conceived and designed the experiments: SF and FM. Performed the experiments: AC. Analyzed the data: SF, FM, AC, and CM. Contributed analysis tools: SF, FM, AC, and CM. Wrote the paper: SF, FM, AC, and CM.

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The Attachment Doll Play Assessment: Predictive Validity with Concurrent Mother-Child Interaction and Maternal Caregiving Representations

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Attachment is central to the development of children's regulatory processes. It has been associated with developmental and psychiatric health across the life span, especially emotional and behavioral regulation of negative affect when stressed (Schore, 2001; Schore and Schore, 2008). Assessment of attachment patterns provides a critical frame for understanding emerging developmental competencies and formulating treatment and intervention. Play-based attachment assessments provide access to representational models of attachment, which are regarded in attachment theory as the central organizing mechanisms associated with stability or change (Bowlby, 1969/1982; Bretherton and Munholland, 2008). The Attachment Doll Play Assessment (ADPA, George and Solomon, 1990–2016; Solomon et al., 1995) is a prominent established representational attachment measure for children aged early latency through childhood. This study examines the predictive validity of the ADPA to caregiving accessibility and responsiveness assessed from mother-child interaction and maternal representation. Sixty nine mothers and their 5–7-year-old children participated in this study. Mother-child interaction was observed during a pre-separation dyadic interaction task. Caregiving representations were rated from the Caregiving Interview (George and Solomon, 1988/1993/2005/2007). Child security with mother was associated with positive dyadic interaction and flexibly integrated maternal caregiving representations. Child controlling/disorganized attachments were significantly associated with problematic dyadic interaction and dysregulated-helpless maternal caregiving representations. The clinical implications and the use of the ADPA in clinical and educational settings are discussed.

Keywords: assessment, play, attachment, caregiving, representation, synchrony

INTRODUCTION

Attachment has been associated with developmental and psychiatric health across the life span, especially emotional and behavioral regulation of negative affect when stressed (Schore, 2001; Schore and Schore, 2008). The synergy of children's emotional, social, cognitive, and language development beginning around age 4 years poises play to be a rich and reliable methodology

for assessing attachment (Solomon et al., 1995; Bretherton and Munholland, 2008). Attachment theory posits that internal representational models of attachment are derived from real experience with attachment figures. They are modulated and regulated by patterns of defensive exclusion and thus influence procedural scripts, memories, evaluations of self and attachment figures; as such, knowing children's representational "rules" enable us to understand how they view their world and make predictions about their development (Bretherton, 2005; Waters and Waters, 2006). Representations are the central organizing mechanism associated with stability or change, and provide a critical frame of reference for child treatment and family intervention (Bowlby, 1969/1982, 1980; Hodges and Steele, 2000; Hodges et al., 2003; Hoffman et al., 2006; Oppenheim and Goldsmith, 2007; Bretherton and Munholland, 2008).

Attachment researchers have developed a range of play-based methods to assess children's attachment patterns in which children "play out" attachment themes. Research findings support theoretically derived predictions regarding the associations between attachment security children's emotional and behavior adjustment in community and risk samples (Oppenheim, 1997; Verschueren and Marcoens, 1999; Goldwyn et al., 2000; Rydell et al., 2005; Goodman et al., 2007, 2012, 2013; Green et al., 2007; Venet et al., 2007; Bureau and Moss, 2010; Stievenart et al., 2011; Webster and Hackett, 2011; Torres et al., 2012; Miljkovitch et al., 2013; Salari et al., 2016). Research findings also support predictions of a disproportionate amount of attachment insecurity (especially disorganized children) in risk samples (e.g., divorce, maltreatment, adoption, foster care, institutionalized) (Gloger-Tippelt and König, 2007; Katsurada, 2007; Román et al., 2012; Torres et al., 2012; Bovenschen et al., 2016).

Caregiver accessibility and responsiveness to the child is the central explanatory mechanism of attachment security (Bowlby, 1969/1982; Ainsworth et al., 1978). Demonstration of an association between attachment security and the attachment-caregiving relationship is therefore considered to be a core construct, essential to validating any measure of attachment. Such studies are sparse, however (Solomon and George, 2016). The present study examines the validity of the Attachment Doll Play Assessment (ADPA, George and Solomon, 1990–2016; Solomon et al., 1995), reporting on two aspects of this core construct: mother-child interactive synchrony and maternal caregiving representation. We begin with an overview of attachment play-based assessments so as to provide an interpretive frame for this study.

Attachment Assessments Using Play

The field of attachment uses "doll play" to tap children's symbolic play around attachment themes. Doll play procedures follow Bretherton's original approach to studying symbolic representation in the preschool period using the Attachment Story Completion Task (ASCT, Bretherton et al., 1990). The ASCT was originally developed to assess attachment security in 4-year-olds. Over several decades, a range of different protocols have appeared in the literature, most of which follow Bretherton et al.'s (1990) approach. The assessment is administered in a private setting, such as a laboratory or clinical office. The play

materials are family dolls and props that create a symbolic "house." Houses range from using minimal props, such as the ASTC (Bretherton et al., 1990) to an elaborately configured Victorian style doll house (e.g., Green et al., 2000). The procedure used to determine the core play family varies across methods. The most common procedure follows the ASCT, whereby the adult (the researcher or clinician) creates a doll family comprised of two dolls and two children, a doll designated as the self and a sibling of the same gender. By contrast, some researchers ask the children to select the family. The ADPA procedure, for example, instructs the children first select the self and then select other family members (George and Solomon, 1990–2016). The majority of procedures then use the designated family for the entire assessment, with one exception – a procedure that asks children if they wish to reconfigure the family members before each story (Farnfield, 2015).

The administration technique is analogous across procedures. The goal is for the adult interviewer to systematically introduce story topics, termed story stems. Story stem scripts are followed exactly, and the interviewer's only interaction with children during their play is to use standardized scripted prompts to encourage children to describe and enact what happens in relation to the attachment topics. Topics are typically limited to four to five core themes conceived in attachment theory as activating the need for parental comfort and protection (Bowlby, 1969/1982): parent-child tension, mildly frightening events, parent separation, and parent reunion. A few procedures add extra topics, such as themes related to parental divorce (Page and Bretherton, 2003); others add a set of generalized stressful topics (e.g., parent loses keys; school bully) (Macfie et al., 2014; Farnfield, 2015). Doll play assessments frequently are used to establish attachment classification groups [secure/insecure; four attachment groups (Ainsworth et al., 1978; Cassidy et al., 1987–1992)]. Classification rubrics typically are developed using *a priori* intuitive extrapolation from other attachment measures or statistical composites based on summing rating dimensions (Bretherton et al., 1990; Green et al., 2000; Gloger-Tippelt et al., 2002). A different approach uses classification criteria based on attachment-expert opinions of essential representational elements (Miljkovitch et al., 2003). Some investigators also report the use of scales to augment or in lieu of classification (e.g., sensitivity, aggression, security, discourse coherency) (Green et al., 2000; Macfie et al., 2008; Webster and Hackett, 2011).

Despite procedural differences, the validity of the doll play method is fairly well established. Validity with other standard attachment measures (e.g., Strange Situation, Attachment Q-Sort) ranges from excellent to acceptable, depending on the method and if measurements were concurrent or administered at different ages. Associations tend to be strongest for comparisons of secure versus insecure attachment groups, for security scales, and associations with attachment disorganization (see Solomon and George, 2016). These procedures are reported to be valid for the use with children ages 3–12 years, although caution should be used when interpreting the doll play assessments of children under 4 years (R. S. Marvin, personal communication, November, 8, 2014). Doll play assessment has been used with English and non-English speaking children (Canada, France, Germany, Israel,

Japan, Spain) (Solomon et al., 1995; Goodman and Pfeffer, 1998; Goldwyn et al., 2000; Green et al., 2000; Gloger-Tippelt et al., 2002; Verschueren et al., 2006; Yamakawa, 2006; Katsurada, 2007; Dubois-Comtois and Moss, 2008; Dubois-Comtois et al., 2011; Román et al., 2012; Goodman et al., 2013; Miljkovitch et al., 2013; Farnfield, 2015; Bovenschen et al., 2016).

The Attachment Doll Play Procedure (ADPA, George and Solomon, 1990–2016; Solomon et al., 1995)

The ADPA is a doll play attachment assessment that follows the tradition of the ASCT (Bretherton et al., 1990). It uses the same basic attachment story stems: *Hurt Knee* (child's knee is hurt by falling off a rock), *Monster in the Bedroom* (child, when sent to bed, tells the parents that there is a monster in the bedroom), *Separation* (parents provide a babysitter to stay at home while they go on an overnight trip), and *Reunion* (parents return from their overnight trip).

There are several key elements in the procedure that differentiate the ADPA from the ASCT and other doll play procedures described in the literature. The most important of these is the classification scheme. The ADPA scheme is based on Bowlby's (1973, 1980) description of defensive processes related to separation and loss (George and Solomon, 1990–2016; George and Solomon, 1998, unpublished) and can also be detected in mothers' internal caregiving representations and in adult responses to free-response ("projective") attachment stimuli (Solomon and George, 1999b; George and West, 2011, 2012). Security is conceived in terms of the flexible integration of attachment-related thoughts and feelings, whereas strategies of defensive exclusion of information can be systematically brought into play as responses to anxiety regarding attachment figures. These processes include "deactivation" (prevention of attachment-related thoughts and feelings), associated with avoidant classifications, and "cognitive disconnection" (disconnection from awareness of the links between affect and thought), associated with ambivalent classifications. When attachment-related distress cannot be contained (assuaged), "dysregulation" of the attachment system (or, in Bowlby's 1980, terms, a "segregated system") is likely to be the result. Depiction of uncontained frightening and catastrophic events, as well as persistent constriction (refusal to play), are the single most defining indices of dysregulation and attachment disorganization (Solomon et al., 1995). The ADPA has demonstrated construct validity; there is significant concordance between the representation classifications and attachment classifications based on children's reunion behavior with the parent (Solomon and George, 2002; Yamakawa, 2006; Dubois-Comtois et al., 2011).

Concurrent evaluation of ADPA classifications demonstrated that the children's responses to the combination of the *Separation* and *Reunion* stories evaluated best predicted children's reunion classification (Solomon et al., 1995). Responses to other stories were more weakly associated with reunion classifications, suggesting that classification schemes that combine all story responses in an additive way are likely to introduce classification error (Solomon and George, 2002).

The ADPA offers some advantages over other doll play systems. The concurrent validation for the four-group classification system that is the most prominent rubric to evaluate attachment patterns in the field provides confidence in the ADPA classification that is not available for other methods, such as the ASCT for example. The MCAST does not differentiate among insecure classification patterns. Most other methods assess doll play in terms of security score (secure vs. insecure), and do not provide classification information (see Solomon and George, 2016 for overview). The examination of doll play against parent reunion also clarified that classification is not an additive process, a finding that is consistent with attachment theory. Attachment is activated differently in different children. Children who are secure in the Strange Situation, for example, may look like avoidant children if only observed during the first reunion with their attachment figure (Ainsworth et al., 1978). These children are thought to need more of a "push" so to speak to demonstrate the secure pattern and classification depends heavily on the observation of the second reunion (Ainsworth et al., 1978). In the same vein, we have noted the secure children, for example, develop stories in response to *Hurt Knee* or *Monster in the Bedroom* that would be associated with children with insecure classifications. Yet their *Separation-Reunion* sequence is the story material that fits their reunion with their mother (Solomon and George, 2002). For example, some children demonstrate sturdy independence in response to the injured knee, and tell a story that would be evaluated as avoidant. We also observed that separation stories do not differentiate among the stories of children in different attachment groups. In short, as in the Strange Situation, it is the representational reunion that provides the best classification information, and it remains an empirical question as to how to think about children's responses to the other story stems (Solomon and George, 2002).

The ADPA has been demonstrated to predict a range of theoretically expected variables in normative and high-risk samples (Dubois-Comtois and Moss, 2008; Stacks and Oshio, 2009; Bureau and Moss, 2010; Dubois-Comtois et al., 2011; Goodman et al., 2013; Salari et al., 2016).

The Association between Attachment Doll Play Assessments and Maternal Caregiving

As previously noted, the association between the children's attachment and parental caregiving is a core tenet of attachment theory. Yet there are only three published studies using attachment doll play procedures that report on these associations. All of these studies are of French-speaking children.

Two reports are from Moss et al. (1997) longitudinal study of attachment beginning in the preschool years. Dubois-Comtois and Moss (2008) and Dubois-Comtois et al. (2011) reported significant associations between children's attachment doll play representations and concurrent mother-child interactive behavior in a sample heterogeneous as to family background, income, including head of household, and education. Children's attachment classifications were assessed at age 8.5 years using the ADPA. Mother-child interaction and mother-child conversation

were observed in two settings, 3 years earlier during snack time in the laboratory and concurrent assessment of family interaction. The results were similar for mother-child interaction at 5.5 years and family interaction at 8.5 years. The interactions of secure children were more coherent and reciprocal than the interactions of disorganized children, with patterns falling in the middle for avoidant and ambivalent-resistant children. Logistic regression results showed that concurrent interaction (family interaction) was a more powerful predictor, however, than mother-child interaction at age 5.5 years. Dubois-Comtois et al. (2011) also reported a significant association between children's representational classification at 8.5 years and mother-child conversation during snack time at age 5.5 years.

Miljkovitch et al. (2013) used the ACST to assess doll play representation in a sample of 3½-year-old children who were preterm and full term infants. The study goal was to examine associations between doll play representations and mother interaction. The study results showed significant associations between difficult and problematic mother-child interactions and disorganized attachment for the full-term children, but not for the preterm children. Although these results are consistent with previous research on attachment disorganization, conclusions about the association between doll play assessments and mother-child interaction may be constrained by infant development (Sameroff, 1993) and the age when the ACST was administered.

The Current Study

This study is the first to examine the concurrent associations between the attachment doll play classifications and parenting. The first set of hypotheses pertained to the association between ADPA attachment classifications and mother-child interaction. Interactions with dyads with secure children were expected to more balanced and harmonious than interaction in dyads with insecure children. Interaction in dyads with disorganized children was expected to be the least balanced and harmonious.

Two other sets of hypotheses examined the role of maternal caregiving representations as related to both ADPA attachment classifications and mother-child interaction. The attachment theory view of caregiving posits that it is guided by the caregiving behavioral system, following Bowlby's (1969/1982) ethological model of attachment. Caregiving system processes regulate representations of self, child, and evaluations of their relationship that are consolidated over time based on experiences with the child (George and Solomon, 1996, 2008; Solomon and George, 1996). Representations are conceived as reflecting mother-child interaction (Solomon and George, 1996; George and Solomon, 2008).

The evaluation of caregiving representation in this study is the same as was described for the ADPA. This approach follows Bowlby's (1980) model of defensive exclusion (see George and Solomon, 2008), defined as unconscious and automatic sorting and exclusion processes that guide and organize representation and behavior. When defensive processes are flexible and integrated, caregiving representations emphasize flexibility, synchrony, adjustment, and mutual enjoyment – qualities associated with maternal sensitivity and children's attachment security (Pasco Fearon and Belsky, 2016). Flexible integration

supports secure base behavior and children's competence, and differentiates between mothers of children with secure and insecure attachment (George and Solomon, 1989, 1996, 2008; Solomon and George, 1999a). By contrast, when defenses are dysregulated, caregiving is at least to some degree disabled and the caregiving-attachment relationship may be said to be dysregulated as well (Solomon and George, 1996, 2011a; George and Solomon, 2008). In these cases, mothers are likely to be overwhelmed by their worst fears about self and child and report becoming flooded by feelings of being out of control, and vulnerable. In essence, these mothers are rendered *helpless* to care for and protect their children (George and Solomon, 2008). *Dysregulated-helplessness* is the term, we use for this dimension of defensive processing (George and Solomon, 2008; Solomon and George, 2011a). This dimension differentiates between mothers of children with disorganized/controlling and organized attachments (secure, avoidant, ambivalent-resistant) and has been shown to be positively associated with parental stress and child behavior problems in infancy and childhood (George and Solomon, 1996, 2008, 2011).

There is considerable support in the attachment literature for the association between mothers' mental processes (e.g., mentalization, reflective functioning) and dyadic interaction (see George and Solomon, 2008, for a complete discussion). This is the first study, however, to examine these associations from the perspective of the caregiving system and the caregiver's representations.

It was hypothesized that there would significant associations between maternal caregiving representations and children's representations of attachment and mother-child interaction. The mothers of children judged secure using the ADPA were expected to have significantly higher flexible integration ratings than mothers of insecure children; and mothers of disorganized-controlling children were expected to have significantly higher dysregulation-helplessness ratings than mothers of organized children (secure, avoidant, ambivalent). Similarly, flexibly integrated caregiving representation ratings were expected to be positively associated with balanced and harmonious mother-child interaction; and dysregulated-helpless caregiving representation ratings were expected to be inversely associated with balanced and harmonious interaction ratings, thus indicative of interaction problems.

MATERIALS AND METHODS

Participants

The participants were 69 mother-child dyads recruited through private and public kindergarten classrooms in the San Francisco Bay Area (Solomon et al., 1995). School principals and directors were first provided letters describing the study, following the guidelines of the institutions' internal review boards or school districts. All of the schools that were approached approved the study, and similar letters describing the study accompanied by administrators' support of the study were sent home in children's classroom packets. Families who were interested in participating returned the letter accompanied by contact information to

classroom teachers. The researcher retrieved this information subsequently from the school and contacted families directly by telephone. The study was once again described, and mothers were provided an opportunity during that conversation to ask questions. The only inclusion criteria for schools and classrooms were that they served typically developing children and were within a 15 mile radius of the playroom to make it feasible for dyads to participate without undue travel.

The children (37 girls, 32 boys) were 6 years old ($M = 68.3$ months; range 57–85 months). Thirty five percent of the children were first born, 42% later born, and 23% were only children. Mothers' mean age was 37.4 years (range 21–49 years). Eight-one percent of the children were living with both parents, 4.3% were living with their mothers in a blended family, and 13% were living with a single head of household mother. Mothers were predominantly college educated (69.6%), Caucasian (80%), with moderate to high incomes.

Measures

Attachment

The child's attachment classification was assessed using the ADPA (George and Solomon, 1990–2016; Solomon et al., 1995). The doll play is administered to each child individually. The doll house is designed as a "single story," with furniture arranged on a large wooden board to designate the kitchen, living room, bedrooms (child and parent), and the backyard. In addition to basic furniture, props include kitchen and food items, children's toys, and a few household items (e.g., telephone). The adult interviewer asks the child to first select the doll to be the self and then select the other pretend family members from three sets of culturally diverse dolls (Caucasian, African American, and Asian). Each set includes a mother, father, female child, male child, and baby. The child is asked to put their pretend family in the house and play for 5 min as a warm up. Children are first asked to select the doll they want to be the self, and are then instructed to select the other dolls in their "pretend" family. They are never asked to select family members to represent real family members. Further, there is no requirements for doll selections that fill actual family roles, such as selecting a parent doll. Children are free to select a self as represented by a child or adult doll. As a result, it is not unusual when given this choice in family member selection for children to create families that have no mother or father or to select adult dolls to be the self. Indeed, these selection elements have been shown to be an index of attachment dysregulation and are prominent in children with disorganized attachments (George and Solomon, 1998, Unpublished).

The assessment is comprised of a set of story stems. Once a story stem is introduced, the interviewer asks the child to *"show me what happens next."* The first story, *Pets,* introduces animals into the play; the mother asks the family if they want to keep the puppy and kitten that have appeared at their door. The next story stems are: *Hurt Knee*, the child falls off of a high rock in the backyard and hurts their knee and can calls out to parents; *Monster in the Bedroom*, the parents tell the child to go to bed and the child cries out that there is a monster in the bedroom;

Separation, the parents leave to go on an overnight trip and a babysitter stays with the children; and *Reunion*, the parents return the next day.

The attachment classification rubric designates five attachment groups based on children's responses to the combined evaluation of the *Separation* and *Reunion* stories (Solomon et al., 1995). Coding is done using verbatim transcripts that records the child's narration and actions. Children judged secure (B) demonstrate family or personal *integration*. Dangers or negative events (e.g., robbers come to the house) are resolved; parents are portrayed as committed and caring; reunions are complete and uninterrupted; or children demonstrate constructive agency during in the parents' absence. Children judged avoidant (A) demonstrate defensive deactivation. Stories include themes that describe complete shifts in attention that neutralize reunion distress, such as blocking the separation or family members asleep on reunion. Characters act non-chalant and casual. Children judged ambivalent (C) demonstrate defensive cognitive disconnection. Reunions are interrupted or incomplete. Ambivalent children often become mentally busy with small details (e.g., arranging dishes, sweeping the house). Children judged disorganized/controlling (D) demonstrate segregated systems processes that overwhelm other fears of their play, evidencing their underlying attachment fears. There are two forms of disorganized-controlling responses. Controlling punitive (D1) children respond with stories in which themes are frightening and uncontained. Characters are threatened or threatening, helpless, out of control, and the self and family are left at risk of *disintegration.* Controlling caregiving (D2) children are constricted. These children appear to be inhibited and extremely uncomfortable with the doll play task, frequently responding to prompts with only statements such as "I don't know," or "nothing happens." Solomon et al. (1995) showed that this was not due to an inability to play or refusal to play with dolls, and that this response pattern is not a form of avoidance. These children had no problem playing with family like toys (e.g., pretend people in a toy castle or space station) during the free play period. The association between constricted responses during assessment with attachment dysregulation has been confirmed in adult assessment using free response picture stimuli depicting people in attachment situations (George and West, 2012).

The ADPA attachment classification distribution was 16 B's, 17 A's, 18 C's, 18 D's (13 D1's; 5D2's). Classifications were completed by the first and second author. Inter-coder reliability, coded blind for the entire sample 71% (kappa = 0.62), with the highest agreement for disorganized versus organized (secure, avoidant, ambivalent combined) classifications, 95% (kappa = 0.85) (Solomon et al., 1995).

Mother-Child Interaction

Dyadic interaction was assessed using Moss et al. (1998) and Moss and St-Laurent (2001) scales for mother-child interaction affective quality, comprised of nine 7-point bipolar rating scales. One scale assesses the *overall* quality of interaction. A high *overall* score reflects balanced and harmonious interaction, with low scores indicating indifference or conflictual interaction. Eight

additional subscales assess the components of balanced and harmonious interaction: *coordination* (smooth goal-oriented vs. unproductive flow of interaction), *communication* (verbal and non-verbal clarity vs. inconsistent or incongruous interchange), *partner roles* (appropriate parent-child role assumption vs. role reversal), *emotional expression* (balanced and shared positive and negative affective states vs. imbalanced, negative, or exaggerated expression), *responsivity/sensitivity* (interaction attunement vs. intrusiveness or ignoring), *tension/relaxation* (calm and comfortable vs. tense or anxious), *mood* (generally positive vs. negative), and *enjoyment* (sustained warmth and pleasure vs. displeasure). A principal-components factor analysis of the nine scales yielded a single factor explaining 83% of the variance (Moss and St-Laurent, 2001). Thus, only the overall scale score representing reciprocal, balanced, and harmonious interaction is used in data analysis (following Moss and St-Laurent, 2001).

Raters blind to all participant information rated dyadic interaction from videotape of mother and child "reading" a wordless story book. Rating and reliability were completed in two steps. Fifty one cases were rated by a reliable rater from the Moss lab. Inter-rater reliability between this rater and another trained rater from the Moss lab on 30% of these cases was 81% for the overall rating and ranged from 70 to 88% on the eight subscales. A third rater from our laboratory was trained to 80% reliability on this set of 51 cases and then rated the remaining 18 cases.

Scale validity has been established for children ages 3–7 years old. These scales distinguish mother-child interaction patterns associated with children's attachment patterns in cross-sectional and longitudinal studies, and have also demonstrated associations with behavior problem ratings and school performance (Moss et al., 1998, 2004a,b; Moss and St-Laurent, 2001). A correlation of 0.71 between the overall rating evaluated in the laboratory and the home observations demonstrated ecological validity for this measure (Dubois-Comtois and Moss, 2008).

Maternal Representation of Caregiving

Caregiving representation was assessed using the *Caregiving Interview*, an interview adapted by George and Solomon (1988/1993/2005/2007) from the *Parent Development Interview* (Aber et al., unpublished). The *Caregiving Interview* is a clinical-style interview designed to activate the caregiving system. The interview encourages mothers to describe memories of specific events, interactions, feelings, and their evaluations of these events using a series of open-ended questions about emotions associated with being a parent (e.g., joy, worry, guilt, confidence). Mothers are also asked to describe attachment-related events such as separations and, for this age of children, beginning school. The interview is relationship specific; that is, mothers are asked to focus on specific experiences and their relationship with a particular child rather than describing generic parenting situations.

This study focused on caregiving representations associated with attachment security and disorganization, utilizing two rating scales, *flexible integration* and *dysregulation-helplessness* (George and Solomon, 1988/1993/2005/2007). *Flexible integration* is characterized by descriptions of caregiving flexibility and self-other balance. High scores reflect an age appropriate commitment to the child's needs, neither at the expense nor indulgence of the mother's own needs; a capacity to support the child's competence and autonomy; sincere mutual enjoyment the desire and ability to seek repair relationship in response to tensions or ruptures and the desire to protect and buffer the child from unnecessary distress or risk. *Dysregulation-helplessness* is characterized by descriptions of behavioral and often also representational dysregulation. Situational examples and appraisals consistently demonstrate that attachment-caregiving situations are overwhelming, frightening, or out of control; mothers describe being helpless to find solutions to common childrearing challenges. These examples often also include descriptions of taking extreme measures, including prolonged and angry mother-child confrontations and battles of wills, freezing and being unable to take action, or failure to recognize children's vulnerability.

Rating is done from verbatim descriptions extracted from the interview of mother-child interaction, called biographical vignettes. All vignettes from a single case are combined into a single transcript and ratings are based on the overall evaluation of these vignettes using 7-point rating scales. High ratings (5–7) are assigned when the scale dimension is predominant. A midpoint rating (4) is assigned when there is clear evidence of that dimension but is not predominant. Ratings 3 and below are assigned when evidence is minimal to absent.

Two sets of raters blind to all information about the participants separately rated flexible integration and helplessness. The audio quality for six interviews was not of sufficient to transcribe, resulting in 63 interviews in the Caregiving Interview sample. Pearson correlations on 20% of the cases demonstrated interrater reliability that ranged from 0.79 to 0.90. Reliability checks between the raters and the first author on these same cases ranged from 0.78 to 0.85. The authors also rated dysregulation-helplessness using interviews for which case identifications were blinded. Correlations between the authors' ratings and those of trained raters on reliability sets from this sample and other samples ranged from 0.80 to 0.92.

These rating scales have been shown to distinguish among child attachment groups (George and Solomon, 1996, 2008). High ratings for flexible integration and dysregulation-helplessness were, respectively, associated with mothers of secure and disorganized/controlling child attachment (Solomon and George, 1999a, 2011b; George and Solomon, 2008). Flexible integration was associated with attachment security for high partner conflict divorced mothers (Solomon and George, 1999a). A significant positive association between dysregulation-helplessness was found for parenting stress and children's adjustment problems (George and Solomon, 2011).

Procedure

Dyads participated in a 90-min laboratory play room laboratory session. After signing consent forms, the dyad was introduced to the laboratory playroom. They were asked to select a book to "read" together from Mayer's (1976) *Four Frogs in a Box* "wordless" story books. When the story was completed, the mother was escorted to an adjacent room where she was given the

Caregiving Interview. The child remained in the playroom with a female adult stranger (child interviewer) who administered the ADPA and remained in the room while the child engaged in free play until the mother returned approximately 1 h later.

RESULTS

Preliminary Analyses

Pearson correlations among family demographic variables showed significant associations between maternal education and family income ($r = 0.30$, $p < 0.05$), and between marital status and family income ($r = -0.42$, $p < 0.001$). A composite score representing family configuration (i.e., maternal education, family income, marital status) was computed using mean standardized scores for these variables (Moss et al., 2004b). There were no significant associations between family configuration, birth order, and child age and the any of variables of interest. There was a significant association between gender and child attachment classification [$r(67) = 0.28$, $p < 0.05$] and maternal dysregulation-helplessness ratings [$t(61) = 2.71$, $p < 0.01$]. Mothers of boys were rated significantly more helpless than mothers of girls. There were significantly more boys in the disorganized/controlling classification groups than girls (see **Table 1**). Child gender was used as a covariate in analyses related to these variables. There were no significant differences on any study variables between the two disorganized-controlling subgroups. The results from these subgroups were combined for the purpose of analyses.

Children's ADPA Attachment Classification and Mother-Child Interaction

The first hypothesis addressed the associations between children's ADPA classifications and mother-child interaction. The means and standard deviations for all interaction scales are shown in **Table 2**. Only the overall rating was used for analysis; the means and standard deviations for all the interaction subscales are provided for descriptive purposes (following Moss et al., 1998; Moss and St-Laurent, 2001). As predicted, secure dyads demonstrated the highest levels of overall balanced and harmonious interaction and controlling-punitive dyads the least.

Analysis of covariance (ANCOVA, gender included as a covariate) showed a significant main effect for attachment

TABLE 1 | Gender distribution of ADPA child attachment classifications.

Classification	Girls	Boys	Total
B	10	7	17
A	9	6	15
C	14	5	19
D1	4	7	11
D2	0	7	7
Total	37	32	69

[$F(4,65) = 7.02$, $p < 0.001$, partial $\eta^2 = 0.30$]. *T*-tests examining secure attachment dyads in relation to insecure dyads showed significant differences between secure and all insecure groups. Secure dyadic interaction was significantly more balanced and harmonious than the interaction in avoidant [$t(31) = 2.71$, $p < 0.01$], ambivalent [$t(31) = 2.65$, $p < 0.01$], and disorganized [$t(32) = 6.22$, $p < 0.001$].

Children's ADPA Attachment Classification and Maternal Caregiving Representation

The second set of hypotheses addressed the associations between children's attachment classifications assessed using the ADPA and maternal caregiving representation. The means and standard deviations for the caregiving representation rating scales for mothers of children in each attachment group are shown in **Table 3**. The results supported the predicted associations for both flexible integration and dysregulation-helplessness ratings.

MANCOVA results (gender included as a covariate) demonstrated a significant main effect for flexible integration [$F(3,60) = 37.16$, $p < 0.001$, partial $\eta^2 = 0.65$] and dysregulation-helplessness [$F(3,60) = 30.74$, $p < 0.001$, partial $\eta^2 = 0.66$]. *T*-tests between secure attachment dyads and the insecure dyads showed significant differences between secure and all insecure groups. The flexible integration ratings for mothers of secure children were significantly greater than the mothers of avoidant [$t(28) = 9.02$, $p < 0.001$], ambivalent [$t(30) = 8.39$, $p < 0.001$], and disorganized [$t(29) = 9.90$, $p < 0.001$] dyads.

T-tests between disorganized attachment dyads and organized dyads also showed significant differences between groups. The dysregulation-helplessness ratings for mothers of disorganized children were significantly greater than the mothers of secure [$t(29) = 8.22$, $p < 0.001$], avoidant [$t(29) = 10.48$, $p < 0.001$], and ambivalent [$t(29) = 12.46$, $p < 0.001$] dyads. There were no significant differences in dysregulation-helplessness ratings among the mothers of children with organized attachments.

Associations between Mother-Child Interaction and Maternal Caregiving Representation

The final set of hypotheses addressed the associations between mother-child interaction and maternal caregiving representation. Analyses using two-tailed Pearson correlations supported both hypotheses. Representational flexible integration was positively associated with balanced harmonious mother-child interaction [$r(63) = 0.49$, $p < 0.001$]. Representational dysregulation-helplessness was inversely associated with balanced harmonious interaction [$r(63) = -0.38$, $p < 0.01$].

DISCUSSION

This study was the first to examine the concurrent predictive validity of the ADPA and dimensions assessing mother-child interactive behavior and maternal representations of caregiving. Further, this study adds significantly to what is a sparse literature

TABLE 2 | Attachment Doll Play Assessment child attachment classification and mother-child interaction: means.

Mother-child interaction	Attachment classification				
	B ($n = 16$)	A ($n = 17$)	C ($n = 18$)	D1 ($n = 13$)	D2 ($n = 5$)
Overall	4.50	3.35	3.50	2.46	2.80
Coordination	4.38	3.24	3.44	2.38	2.60
Communication	4.44	3.29	3.33	2.96	3.60
Appropriate role assumption	4.25	3.12	3.33	2.23	3.40
Emotional expression	4.44	3.12	3.30	2.77	3.40
Responsivity/sensitivity	4.31	3.12	3.56	2.31	2.80
Tension/relaxation	4.00	2.94	3.11	2.54	3.00
Mood	4.50	3.41	3.56	2.85	3.40
Enjoyment	4.50	3.41	3.78	2.92	3.40

TABLE 3 | Attachment Doll Play Assessment child attachment classification and maternal caregiving representation: means.

Caregiving representation rating	Child attachment				
	B ($n = 15$)	A ($n = 15$)	C ($n = 17$)	D1 ($n = 12$)	D2 ($n = 4$)
Flexible integration	5.37	2.13	2.24	1.87	2.50
Dysregulation-helplessness	3.00	3.03	2.53	5.83	5.87

examining any doll play procedure in relation to core attachment theory constructs.

As predicted, the findings demonstrated that secure mother-child dyads, classified using the ADPA, engaged in significantly greater balanced and harmonious interactions than insecure dyads, with disorganized-controlling dyads showing the most interactive problems. This finding is consistent with longitudinal studies in which parent-child interaction and the ADPA doll play classification were evaluated several years apart (Dubois-Comtois and Moss, 2008; Dubois-Comtois et al., 2011). This finding is also consistent with the one other study of this kind, using the ACST (Miljkovitch et al., 2013) and studies demonstrating associations between mother-child interaction and attachment assessed using reunion procedures (e.g., Humber and Moss, 2005). Further, the results of the current study echo observations of the dyadic interaction breakdown that has been shown characteristic of disorganized toddlers under stress (Solomon and George, 1999a) and are consistent with a robust literature documenting mother-child interaction problems for disorganized and controlling children (Lyons-Ruth and Jacobvitz, 2016).

This study also found strong significant associations between mothers' caregiving system representations and children's attachment patterns. As predicted, mothers of secure children were differentiated from mothers of insecure children on the dimension of representational flexibility and integration. The interviews of mothers of secure children were characterized by descriptions of events with their children that expressed trust, cooperation, knowledge of self and child as individuals, and the joy of parenting. They described communicating clearly about caregiving and attachment goals, and thinking about a balanced solution when parents' and children's goals conflicted. These representational qualities contribute to sensitivity and the robust association in attachment literature between a range of "sensitive"

parenting mental states and attachment security (see George and Solomon, 2008 for a literature review).

By contrast, ratings for dysregulated-helpless caregiving were highest in mothers of disorganized-controlling children. Representations of caregiving in these mothers were markedly out of balance, consistent with the controlling nature of their children on reunion (Solomon et al., 1995). Descriptions of events revealed the clear potential for *failed* protection, a phenomenon we have termed "abdication" of care (Solomon and George, 1996; George and Solomon, 2008). The descriptive vignettes of mothers of disorganized-controlling children mirrored their children's doll play stories. For mothers of punitive children, care and conflict with their children unleashed their worst fears. Mothers described themselves as being as out of control (e.g., acting like "maniacs," defiant, hysterical, threatening), and their children were often cast as antagonists, "devils" that rendered them helpless to combat or organize their children's behavior. Mothers of caregiving children often described themselves as psychologically or behaviorally frozen. They also had difficulty describing mother-child interaction vignettes, and could abruptly stop speaking in mid-sentence. They often described the need for absolute withdrawal from interacting with their children, sometimes associated with descriptions of becoming frightened that they could not maintain behavioral or emotional control if they remained in these situations. Their children tended to be described in the role of parental care, "angels" who did no wrong and were compassionate and sensitive not only to their mothers but had remarkable empathy for all living creatures. Lacking even a basic sense of "felt protection," it is no wonder that the doll play of punitive and caregiving children was, respectively, wild and out of control or frozen and constricted.

The results of this study also add to the literature demonstrating significant associations between mothers'

representational states of mind and mother-child interaction for mothers of secure children. These include, for example, studies examining representational sensitivity and mind mindedness (e.g., Oppenheim and Koren-Karie, 2002; Grienenberger et al., 2005; Demers et al., 2010). There are no other studies to date that have examined the relation between maternal representation and mother-child interaction for disorganized-controlling children.

This study failed to find differences in any variables for the disorganized-controlling subgroups (punitive, caregiving). There were no differences in mother-child interaction between these two groups of children, suggesting that these mothers equally communicate a sense of failed protection and abandonment to their children. This finding stands in contrast, however, to the results reported by studies by Moss et al. (2004a,b), who found interaction differences between the D1 and D2 groups in both the preschool and childhood years. One explanation for the failure to find differences between the dis-organized-controlling groups in this study may stem from the disproportionate number of boys with disorganized-controlling attachments in the current sample. Seventy four percent of the children in the disorganized/controlling group in the current study were boys, as were all of the children in the controlling-caregiving subgroup. Mothers of boys reported significantly higher helplessness ratings than mothers of girls. Although gender differences are not predicted by attachment theory, research is beginning to demonstrate that gender predicts divergent interactive behavior and child development outcomes as children grow beyond infancy (Hazen et al., 2011; Pasco Fearon and Belsky, 2016), with boys being more difficult than girls.

In addition to the gender composition of the disorganized-controlling attachment group, there are several other limitations to the current study that should inform future research. With regard to the ADPA, studies are needed to investigate test-retest reliability. Further, future research would benefit from including samples with children younger and older than this sample. Finally, the cross-sectional concurrent design cannot address questions of continuity and discontinuity in the associations reported here.

Clinical Importance of the ADPA

The inspiration to use semi-structured doll play to assess children's internal working models of their attachment relationships drew on the tradition of child psychotherapy, pioneered by early clinicians such as Anna Freud and Melanie Klein. The results of this study permit the field of attachment to repay that debt. First, it provides empirical validation for the clinical insight that such play is indeed a window into the child's inner world and it is indeed related to the observed quality of interaction patterns with attachment figures. Second, it demonstrates that the quality of the children's attachment to their mothers provides the framework for the *organization* of that play. Hence, it is advantageous to clinicians and educators to have a thorough understanding of attachment theory and of attachment-related defenses in order to make sense of the doll play of any particular child.

Variations in doll play associated with each of the attachment groups provide useful information about what is normative and what is potentially problematic. Most striking is the fact that similar "florid" symbolic content can be typical of both secure and disorganized children. Many secure children in this study created disaster scenarios in response to story probes, leading the naïve observer might feel concern about children's emotional regulation capacities or experiences. In fact, the rich narratives of secure children probably indicate an ability to express and flexibly integrate normative fears of separation and loss. Significantly, the failure to depict the successful resolution of their fears was the distinguishing feature of children in the disorganized group. Similarly, the placid stories or the party themes of some insecure children are likely perhaps to falsely reassure observers just as they probably do the children themselves. These stories, in fact, belie the significant anxieties of these children and the constraints they feel to express or experience them.

In a similar vein, it is important for observers to be aware that the content of doll play is indeed symbolic and strongly influenced by fantasy and associative processes. The children in this study—even the disorganized/controlling children—did not literally experience airplanes flying in the house, volcanoes, witches, getting lost and the like; probably none of them had in this sample experienced maltreatment in a formal sense. When doll play is observed among children who are clinically referred for behavior problems, clinicians in training or untrained observers have a tendency to take story content literally. Indeed, we have known observers to wish to make social services reports on the basis of the play or actually to do so. Just as the interpretation of dreams requires patient analysis of dream content based on knowledge of or interaction with an individual, we caution those new to this kind of work to maintain an open-minded stance regarding doll play assessments. Play content is best used to formulate hypotheses about the child's experience that can be confirmed or clarified over time.

In fact, if we view the doll play as essentially indicative of children's defenses, there is all the more reason for educators and observers to adhere to the usual unobtrusive stance of experienced play therapists, who refrain from interpretation or challenging children's defenses until a therapeutic alliance is well-established. The same should be said about children's failures to engage in symbolic play during the ADPA. "I don't know" in response to continued probes does not necessarily mean that task administration of the task has failed in some way or that children lack knowledge or desire to be difficult (though these may sometimes be the case). A more productive assumption is that these children are fearful of entertaining their own thoughts and emotions; such defenses require more, rather than less respect.

Access to the results of attachment security assessments *at a general level* can expand clinicians' and educators' understanding of children in their care by providing information about children's representation of self in relationships. Direct observation of children's doll play on attachment themes may help to clarify the emotional underpinnings of difficult or worrisome behavior of young children at home or in the

classroom. For example, externalizing behavior is often, but not necessarily, associated with attachment disorganization. When doll play suggests secure attachment yet there is evidence of behavior problems, it may be wise to consider other sources of these problem behaviors. However, we strongly recommend against the use of such assessments as a way of formally assessing the mental health of particular young children or the quality of family life.

The ADPA is a demonstrated valuable and valid tool to use to unravel children's inner experience. It requires considerable training to administer and code reliably. Furthermore, classification information can have the unfortunate effect of labeling or pathologizing young children. Although attachment classifications appear to reflect different levels of developmental risk in a population, they do not convey specific diagnostic information for particular children. Considerably more research is required with respect to both the ADPA and other symbolic representational assessments to understand fully their predictive strengths and limitations.

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CG and JS share equally the data set presented in this paper. CG was in charge of data analysis and was the primary author responsible for writing the paper. JS contributed ideas and editing to the paper.

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Mother–Infant and Extra-dyadic Interactions with a New Social Partner: Developmental Trajectories of Early Social Abilities during Play

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Mother–infant interactions during feeding and play are pivotal experiences in the development of infants' early social abilities (Stern, 1985, 1995; Biringen, 2000). Stern indicated distinctive characteristics of mother–infant interactions, respectively, during feeding and play, suggesting to evaluate both to better describe the complexity of such early affective and social experiences (Stern, 1996). Moreover, during the first years of life, infants acquire cognitive and social skills that allow them to interact with new social partners in extra-dyadic interactions. However, the relations between mother–child interactions and infants' social skills in extra-dyadic interactions are still unknown. We investigated longitudinally the relations between mother–child interactions during feeding and play and child's pre-verbal communicative abilities in extra-dyadic interactions during play. 20 dyads were evaluated at T_1 (infants aged between 9–22 months) and 6 months later, at T_2. The interdyadic differences in mother–infant interactions during feeding and play were evaluated, respectively, with the "Feeding Scale" (Chatoor et al., 1997) and with the "Play Scale" (Chatoor, 2006) and the socio-communicative abilities of children with a new social partner during play were evaluated with the "Early Social Communication Scales" (Mundy et al., 2003). We distinguished the dyads into two categories: dyads with functional interactions (high dyadic reciprocity, low dyadic conflict) and dyads with dysfunctional interactions (lower dyadic reciprocity, higher dyadic conflict). At T_1, infants belonging to dyads with dysfunctional interactions were significantly lower in "Initiating Joint Attention" and in "Responding to Joint Attention" in interaction with a new social partner compared to the infants belonging to dyads with functional interactions. At T_2, infants belonging to dyads with dysfunctional interactions were significantly lower in "Initiating Social Interactions" with a new social partner compared to the infants belonging to dyads with functional interactions. There were significant correlations between the quality of mother–infant interactions during feeding and infants' social abilities in interaction with a stranger both at T_1 and at T_2. This study showed a stable relation over time between mother–child interactions and child's social communicative skills in extra-dyadic interactions.

Keywords: mother-infant feeding and play interactions, new social partner in extra-dyadic play interactions, early social communication assessment, developmental trajectories, follow-up study, intervention programs to enhance caregiver–infant relationships

INTRODUCTION

This study explores the developmental trajectories of mother–infant interactions during feeding and play and of extra-dyadic interactions with a stranger during play in the first 2 years of life. The theoretical and empirical framework is the Infant Research, which combines the attachment theory with the developmental models of intersubjectivity (Stern, 1985; Trevarthen and Aitken, 2001; Lavelli, 2007; Papoušek, 2007; Ammaniti and Gallese, 2014). According to this framework, the infants' social communication abilities emerge within the context of functional dynamic interexchanges between infants and caregivers (Dunst et al., 1990; Sameroff, 2010).

From this perspective, the quality of mother–infant interactions during the first years of life is grounded both on the infant natural predisposition to socially interact with their partners and on the mother's behavior and her emotional availability (Stern, 1995; Biringen, 2000; Papoušek, 2007). The most important and well-known feature of maternal behavior is sensitivity to the infants cues. Mothers who accurately perceive and respond to the infant needs, distress and communication efforts are more likely to promote the infants' socio-communicative abilities than the mothers who ignore, reject or respond inconsistently to the infant needs and communication bids (Ainsworth et al., 1978; Teti and Candelaria, 2002; Meins et al., 2011). This sensitivity might promote a mutual mother–infant engagement, whit a beneficial effect on infants' socio-communicative development (Teti and Candelaria, 2002).

Mother's sensitivity promotes high levels of infant cooperation with the mother behavior toward the infant during the first years of life (Ainsworth et al., 1978). At the same time, the quality of maternal behavior is bound up by infant characteristics, so that a mother is sensitive as long as she is able of modifying her behavior in response to the infant's individual characteristics and needs. Moreover, maternal emotional availability plays a preeminent role in the development of mother-infant healthy adaptation (Emde, 1980; Biringen, 2000). The parental emotional availability view (Biringen, 2000; Emde, 2000) of sensitivity (Ainsworth et al., 1978) emphasizes several significant aspects of parental sensitivity, like the affective level of the interactions, the negotiation of the intra-dyadic conflicts and the dyssynchronous interactions, including the successful repair of such situations (Tronick and Cohn, 1989; Biringen et al., 1997). As shown by recent studies, mother–infant interactions are not characterized by continuous synchrony, but the ongoing regulation within the dyad can vary in terms of degrees of coordination, disruption and repair, and maternal flexibility to manage this variability (Beebe and Lachmann, 1994).

From the theoretical and empirical perspective described so far, mother–infant interactions during feeding and play have been intensively studied as the ideal contexts to promote children socio-communicative abilities (Stern, 1995, 1996; Biringen, 2000; Meins et al., 2011). In the course of the uncountable mutual exchanges during feeding and play activities with their mother, infants not only practice a number of social skills like turn-taking and joint attention behaviors, but they also develop

self-regulatory abilities and a basic sense of self (Fogel, 1995; Fonagy et al., 2002; Feldman, 2007; Ammaniti and Gallese, 2014; Lucarelli et al., 2017).

However, reviewing the literature, we have found that little systematic attention has been given in order to determine whether the quality of mother–infant interaction is related to the infant social abilities in interaction with a stranger in extra-dyadic contexts. Only five studies to date, for the best of our knowledge, explored this relationship; all these studies used the Early Social Communication Scales (E.S.C.S.), a structured observation developed by Mundy et al. (2003) in order to measure the infant's social communicative competencies in extra-dyadic interactions.

In a longitudinal study, Markus-Meyer et al. (2000) demonstrated that the infants' abilities to respond to joint attention correlates with the joint attention episodes during mother–infant interaction in a free play context at 18 months.

Another study (Crowson, 2001) indicated that attachment at 15 months predicts joint attention exchange during mother–infant interactions at 24 months but only in relation to the infants' early joint attention abilities in interaction with a stranger. Meins et al. (2011) showed that, at 15 months, initiating joint attention with an experimenter is associated with insecure-avoidant attachment. These results seem to indicate that insecure-avoidant infants may compensate for reduced social contact with the caregiver by producing more initiating joint attention behaviors during the interaction with a stranger compared to infants with secure attachment. Another study (Farhat, 2010) evidenced that responding to joint attention predicts language development at 24 months but only in infants belonging to dyads with low levels of maternal intrusiveness.

Finally, a recent study confirmed the relationship between the quality of mother–infant interaction and the infant's social communicative competencies in extra-dyadic interactions (Fadda et al., 2014). Infants aged between 9 to 24 months were observed in interaction with the mother during feeding and play and in interaction with a stranger with the E.S.C.S. The results indicated a negative correlation between high levels of interactive conflict in mother–infant interaction during feeding and play and the ability of the infant to respond to joint attention behaviors in an extra-dyadic context.

In summary, the five studies illustrated so far indicated a relationship between the quality of mother–infant interaction and the infants' social abilities in interaction with a stranger. However, these studies are still spare and need confirmation. Moreover, it is still unknown whether infants' social abilities in extra-dyadic contexts are related with the quality of mother–infant interaction across two time points.

Aims of the Study

This study aimed to expand a previous cross-sectional research data (Fadda et al., 2014), by investigating prospectively the relationship between mother–infant interactions and infant social competencies with a stranger across two time points: at T_1, when the infants were aged between 9 and 22 months, and 6 months later, at T_2. We chose to investigate the relationship between mother–infant interactions and infant

social competencies specifically 6 months later because this is the same as that for the longitudinal assessment by means of the Feeding and Play Scales (Chatoor et al., 1998; Chatoor, 2006) used in previous studies. This interval has also been frequently used in the studies that used the Early Social Communications Scales (Mundy et al., 2007). This time interval takes into account the speed at which the developmental changes in the abilities considered are expected to occur in order to ascertain the process of development. Considering the wide age range of participants at T1, this study needs to be considered as exploratory. We assessed a sample of mothers without a current psychopathological condition in order to explore the relations between the quality of mother–infant interactions and infant social skills in absence of maternal psychopathological illness, which is a well-known risk factor for infant development (see for a review: Seifer and Dickstein, 2000).

MATERIALS AND METHODS

Participants

The present study examined 20 dyads at T1 when the children (19 males) aged between 9–22 months (mean age = 14 months; $SD = 3.873$) and at T2 (infants aged between 15–28 months; mean age = 20 months; $SD = 3.873$). The current study continues a cross-sectional research, previously published (Fadda et al., 2014), by evaluating the dyads of the original sample. 10 of the 30 dyads of the original sample dropped-out at T2 and, therefore, they were not considered in this prospective study. Participants were recruited in two public childcares in the city of Cagliari. Mothers were aged between 30 and 43 years (mean age = 35; $SD = 4$). The gestational age and the development of all children were in the normal range, and they were all the only child of the family. All children were breast-fed and weaned at T1. Their mothers did not show psycho-pathological symptoms as evaluated at the beginning of the two time points by the Psychiatric Symptom Checklist-90-Revised (Derogatis, 1994). The dyads belonged to the middle/middle-high socioeconomic level, according to the Hollingshead's social status index (1975).

Ethics Statement

Informed written consent was obtained from the parents. The study was approved by the ethics committee of the Department of Pedagogy, Psychology, Philosophy of the University of Cagliari (Italy) and it was carried out in accordance with the Society for Research in Child Development's (SRCD) Ethical Standards for Research with Children, the Italian Psychological Association's Ethical Standards for Research with Humans, and the World Medical Association's Helsinki Declaration, as revised on October 2008.

Measures

Feeding Scale-Observational Scale for Mother–Infant Interaction during Feeding

Each dyad was observed for 20 min at the usual time of one of the main meals of the children. The mothers were invited to behave as they usually do with their children at home (Chatoor

et al., 1997) and mother–child interaction was video-recorded and coded according to the Feeding Scale-Observational Scale for Mother–Infant Interaction during Feeding (Chatoor et al., 1997), in the Italian version "Scala di Valutazione dell'Interazione Alimentare Madre-Bambino – S.V.I.A." (Lucarelli et al., 2002; Ammaniti et al., 2006, unpublished). The S.V.I.A. includes 41 items, representing four subscales: Affective State of the Mother, Interactional Conflict, Food Refusal Behavior of the Child, and Affective State of the Dyad. Each item received a score on a Likert scale of 0 (*none*), 1 (*a little*), 2 (*pretty much*), and 3 (*very much*); a global rating is obtained for each subscale.

Affective state of the mother subscale (15 items)

Affective State of the Mother subscale (15 items) refers to both the possible difficulties of the caregiver in showing positive affect and the frequency and quality of negative affect. It also evaluates the mother's ability to interpret the child's signals and facilitate reciprocal and empathic exchanges. The higher the rate in this subscale, the greater the number of the mother's difficulties in expressing positive feelings and in correctly interpreting and tuning according to the infants' needs. Some examples of the items of this subscale are: "Mother shows pleasure toward infant in gaze, voice, or smile"; "Mother positions infant for reciprocal exchange"; "Mother appears cheerful"; "Infant smiles at mother"; "Mother appears sad"; "Infant avoids gaze."

Interactional conflict subscale (16 items)

Interactional Conflict subscale (16 items) evaluates both the presence and intensity of exchanges of conflict within the dyad. The overall number of points is high when, for example, the mother forces the child to eat, she is not flexible in regulating pauses and turn-taking with the child, and she directs the meal according to her own emotions and intentions rather than following the communicative feedback of the child whereas the child shows behaviors of distress and avoidance of feeding exchanges in response to the intrusiveness of the mother. Some examples of the items of this subscale are: "Mother controls feeding by overriding infant's cues"; "Mother misses infant's cues"; "Mother interrupts or terminates feeding causing distress in infant"; "Infant refuses to open the mouth"; "Infant cries when food offered"; "Mother appears distressed"; "Infant appears distressed."

Food refusal behaviors of the child subscale (4 items)

Food Refusal Behaviors of the Child subscale (4 items) explores the feeding patterns of the child, indicating food refusal, poor nutritional intake, and difficult regulation of state such as irritability and/or hyperexcitability, being easily distracted, showing opposition, and negativity. This subscale also examines non-contingent maternal behaviors during feeding ex-changes (i.e., when the mother is not able to share the child's rhythms and arbitrarily interrupts the meal, causing discomfort to the child). A high rate indicates a lack of reciprocal adaptation between the two partners and a high frequency of child's food refusal behaviors. Some examples of the items of this subscale are: "Infant turns away from food"; "Infant arches from food"; "Infant appears easily distracted during feeding."

Affective state of the dyad subscale (6 items)

Affective State of the Dyad subscale (6 items) evaluates the quality of affect in the mother–child interaction. A high rate indicates a negative involvement in the dyad, in which emotions of anger and hostility prevail. In this situation, the caregiver does not facilitate the child's autonomous initiatives by exerting a constant control. The child is intensely reactive, showing distress. Some examples of the items of this subscale are: "Mother waits for infant to initiate interactions"; Mother forces bottle or food into infant's mouth"; "Mother distracts or allow infant to distract during feeding"; "Child appears angry."

The Feeding Scale (Chatoor et al., 1997, 1998) and the Italian version S.V.I.A. evaluate the quality of mother–infant interactions to highlight infants and toddlers that need to be seen for further clinical evaluations. However, this scale also indicates a borderline cut-off, which indicates transient dysfunctional interactions that "should be watched over time," even though the dysfunctions are not of concern at the moment.

The borderline cut-off allows to distinguish the dyads into two categories:

Dyads with functional interactions

T-scores lower than 60 in each of the four subscales indicate an interaction characterized by reciprocity, positive affect, low conflict and infant's self-regulatory abilities during feeding.

Dyads with dysfunctional interactions

T-scores between 60 and 70 in two of the four subscales of the Feeding Scale indicate a condition of transient dysfunctional interaction that "should be watched over time."

Studies carried out for psychometric properties have confirmed satisfactory inter-rater reliability, construct, and discriminant validity for this tool (Chatoor et al., 1997; Lucarelli et al., 2002; Ammaniti et al., 2004a,b, 2010). In the Italian version, the inter-rater reliability, estimated with the use of intraclass correlation coefficients, was from Pearson's $r = 0.82$, $p \leq 0.01$, to Pearson's $r = 0.92$, $p \leq 0.01$. The discriminant analysis used to assess the ability of the Feeding Scale to predict group membership of normally developing children (vs. children with feeding disorders) showed correct group classification ranging from 82 to 92% (Ammaniti et al., 2004a,b, 2010).

Parent-Child Play Scale

After the meal, mother–infant interaction was observed during free play. During 10-min play session, mothers were provided a standardized set of age appropriate toys and were instructed to play with their children as they would at home, according to the procedure indicated by Chatoor (2006). Mothers and children could play with the following toys: a doll, a baby bottle, colored blocks, a book of figures and a shape sorter toy. The mother–child interaction in the Play Scale includes 32 items representing four subscales: Dyadic Reciprocity, Maternal Unresponsiveness to the Infant's/Toddler's Cues, Dyadic Conflict and Maternal Intrusiveness (Chatoor, 2006); the Italian version "Scala di Valutazione dell'Interazione di Gioco Madre-Bambino" was used (Lucarelli and Cimino, 2008). Each item received a score on a Likert scale of 0 (none), 1 (a little), 2 (pretty much), and 3 (very much). If the behavior did not occur, it was rated as 0

(none); if the behavior was observed sometimes or rarely, it was rated as 1 (a little); if the behavior occurred several times, it was rated as 2 (pretty much); and if the behavior occurred often or repeatedly throughout the observational period, it was rated as 3 (pretty much).

Dyadic reciprocity subscale (15 items)

Dyadic Reciprocity subscale (15 items) evaluates the quality of the mother–infant interaction in terms of positive affect and synchrony and reflects the quality of relatedness and affective engagement between the mother and child. Both the mother and infant spontaneous bids to initiate social interactions are considered. The rating system of this scale was reversed, with higher scores indicating low dyadic reciprocity. Some examples of the items of this subscale are: "Parent attends to the infant's play"; "Parent enjoys interacting with the infant"; "Parent makes encouraging remarks about the infant's play"; "Child looks at parent"; "Infant plays with parent."

Maternal unresponsiveness to infant's/toddler's cues subscale (6 items)

Maternal Unresponsiveness to Infant's/Toddler's Cues subscale (6 items) refers to the degree of which a parent fails to be contingent and to support the infant's play activities and appears unaware of the child's ongoing activities during play. Some examples of the items of this subscale are: "Parent positions or holds infant with restriction of normal movement"; "Parent is unaware of the infant's activities"; "Parent appears detached and/or withdrawn from the infant."

Dyadic conflict subscale (6 items)

Dyadic Conflict subscale (6 items) refers to the degree to which the parent displays anxiety, distress, anger, and/or makes negative or critical remarks about the child or criticizes the child's play, and the degree to which the child appears distressed, and/or angry during the entire observational period; this subscale evaluates the mother-infant conflict during play and the difficult in cooperating during the interaction. Some examples of the items of this subscale are: "Parent appears distressed"; "Parent appears angry"; "Parent makes negative or critical remarks about the infant's play"; "Infant appears distressed."

Maternal intrusiveness subscale (5 items)

Maternal Intrusiveness subscale (5 items) describes the extent to which the mother handles her child unnecessarily, acts arbitrarily and is disruptive to the child's ongoing activities, or the extent to which the parent directs the child's play verbally and/or physically, or the parent's behaviors are not consistent with the child's interests or cues; this subscale evaluates the maternal intrusiveness and the mother's difficult in supporting the infant's spontaneous cues to initiate social interaction and her/his attempts to be autonomous during play. Some examples of the items of this subscale are: "Parent directs infant to do or not to do"; "Parent controls infant's play without regard for infant's cues"; "Parent waits for infant to initiate interactions."

Early Social Communication Scales (E.S.C.S.)

The Early Social Communication Scales – E.S.C.S. (Mundy et al., 2003) is a structured observation, which lasts 20 min, aimed to

assess the individual differences in the infant's preverbal socio-communication abilities between 8 and 30 months. The infant and the unfamiliar adult seat to the opposite sides of a tall table. Four posters (60 cm × 90 cm) were positioned, respectively, on the right, back right, on the left, back left. The experimenter presented to the child a series of 17 activities, aimed to elicit the infants' socio-communicative behaviors, both in initiating and in responding to the adult's communicative behaviors. The E.S.C.S. evaluates infants' early social abilities from an interactional perspective, in which joint attention abilities not only predicts infants' language development but also their abilities to represent the content of others' mind (Mundy, 1995). Previous studies indicated a high inter-rater reliability of the E.S.C.S., ranging from 0.83 to 0.97 (Mundy et al., 1995, 2003). An example of the activity is the Object Spectacle Tasks, in which three wind-up mechanical toys and three hand-held mechanical toys (balloon, squeeze toy, cone toy, bellows toy are presented. In each presentation, the tester activates the toy on the table in front of, but out of reach of the child. Toys should be wound up enough to remain active for at least 6 s but not so long that the child loses interest.

The child's social-communicative abilities were coded into three subscales:

Joint attention behaviors
The infant shares a common focus of attention with the adult by establishing eye contact, showing an object, giving and object or by following the direction of the adult pointing.

Behavioral requests
The infant requests an object or an event. For example, the infant might point toward a target object and/or give an object to the experimenter.

Social interactions
The infant engages in turn-taking activities and in reciprocal social interactions, like for example tickle or singing.

Furthermore, the behavior of the child in each subscale was distinguished into two subcategories: ⟨initiating⟩ a social interaction or ⟨responding⟩ to the experimenter communicative behavior.

Procedure
The dyads were evaluated at T1 when the children (19 Boys) aged between 9–22 months (mean age = 14 months; SD = 3), and after 6 months at T2. Each dyad has been observed at home during feeding and free play. Mother–child interactions during feeding and playing were examined using the "Feeding Scale" (Chatoor et al., 1998; Lucarelli et al., 2002; Ammaniti et al., 2006, unpublished) and the "Play Scale" (Chatoor et al., 1997; Chatoor, 2006; Lucarelli and Cimino, 2008). The dyads were observed at the time in which the child usually ate (between 11:00 and 12:00 am). Moreover, we analyzed the socio-communicative abilities of the toddlers with a new social partner using the "Early Social Communication Scales" (Mundy et al., 2003). The E.S.C.S. were administered 2–3 days after the other two observations at the Laboratory of the Department of Pedagogy, Psychology, Philosophy of the University of

Cagliari, at the same time interval of the observation of the feeding and of the play (between 11:00 and 12:00 am). The observational data were coded by independent coders, trained and certified in the use of the Feeding and Play Scales, and the E.S.C.S.

Inter-rater Reliability
Encodings were performed by two independent observers for each of the assessment tools used. At T1, the percentage of agreement between observers, calculated on 25% of the videotaped material, was the 79% for the SVIA, 89% for the Play Scale and 80% for the ESCS. At T2, the percentage of agreement between observers, calculated on 25% of the videotaped material, was the 80% for the SVIA, 88% for the Play Scale and 82% for the ESCS.

RESULTS
The results indicated that the majority of the dyads showed functional interactions at T1 (11 dyads) and at T2 (12 dyads). As shown in **Table 1**, some dyads changed the nature of their interaction: 3 of the dyads that showed functional interactions at T1 showed dysfunctional interactions at T2, while 4 of the dyads that showed dysfunctional interactions at T1 showed functional interactions at T2. These results, even so preliminary considering the low number of participants included in this study, seem to indicate the transient nature of the mother–infant interaction during feeding at this early age, characterized by the challenges of the developmental pathways through a process that requires to reach an equilibrium between attachment to the caregiver and emerging autonomy, according to age and developmental stage.

At T1, the dyads with dysfunctional interactions were characterized by higher level of negative affect (Mann–Whitney U-test = 11.50, p = 0.002) and higher level of interactional conflict (Mann–Whitney U-test = 7.50, p = 0.001), compared to the dyads with functional interactions in the Feeding Scale (**Figure 1**).

At T2 (**Figure 2**), the dyads with dysfunctional interactions between mother and his/her child showed higher scores in all the subscales of the Feeding Scale compared to the dyads with functional interactions: higher levels of negative affect (Mann–Whitney U-test = 7.50, p = 0.001), interactional conflict

TABLE 1 | Frequency of dyads with functional and with dysfunctional interactions at T1 and T2.

		Feeding Scale T_2		
		Functional interactions	**Dysfunctional interactions**	**Total**
Feeding Scale T_1	Functional interaction	8	3	11
	Dysfunctional interaction	4	5	9
Total		12	8	20

FIGURE 1 | Mean scores of dyads with functional and dysfunctional interactions at T1 in the four subscales of the Feeding Scale. The *p*-value is reported for the comparison between the dyads with functional and dysfunctional interactions (Mann–Whitney test for independent samples; *$p < 0.05$).

FIGURE 2 | Mean scores of dyads with functional and dysfunctional interactions at T2 in the four subscales of the Feeding Scale. The *p*-value is reported for the comparison between the dyads with functional and dysfunctional interactions (Mann–Whitney test for independent samples; *$p < 0.05$).

(Mann–Whitney U-test = 7, $p = 0.001$), food refusal behaviors (Mann–Whitney U-test = 9.50, $p = 0.002$) and maternal distress (Mann–Whitney U-test = 13.50, $p = 0.005$). Both the results at T1 and T2 indicate interdyadic differences during feeding, with the dyads with dysfunctional interaction showing more aversive interactional conditions even in absence of maternal psycho-pathological symptoms.

The analysis of the mother–infant interaction during play at T1 (**Figure 3**) of the dyads with dysfunctional interactions showed lower dyadic reciprocity (Mann–Whitney U-test = 19.50, $p = 0.020$), higher maternal non-contingency (Mann–Whitney U-test = 11, $p = 0.002$), higher dyadic conflict (Mann–Whitney U-test = 12,

$p = 0.003$) and higher maternal intrusivity (Mann–Whitney U-test = 10.50, $p = 0.002$), compared to the ones with functional interactions.

At T2 (**Figure 4**), the dyads with dysfunctional interactions showed lower dyadic reciprocity (Mann–Whitney U-test = 13,50, $p = 0.005$) and higher dyadic conflict (Mann–Whitney U-test = 10, $p = 0.002$), compared to the mothers with functional interactions. These results, both at T1 and T2, confirm also in play more aversive interactional conditions in the dyads with dysfunctional interaction compared to the dyads with functional conditions.

We also evaluated the infants' socio-communicative abilities with a stranger using the E.S.C.S. in the dyads with functional
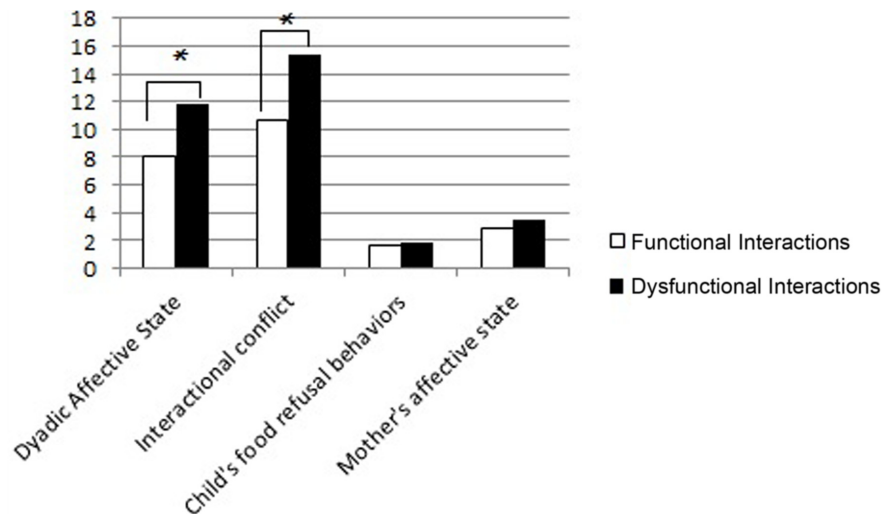
FIGURE 3 | Mean scores of dyads with functional and dysfunctional interactions at T1 in the four subscales of the Play Scale. The p-value is reported for the comparison between the dyads with functional and dysfunctional interactions (Mann–Whitney test for independent samples; *p < 0.05).
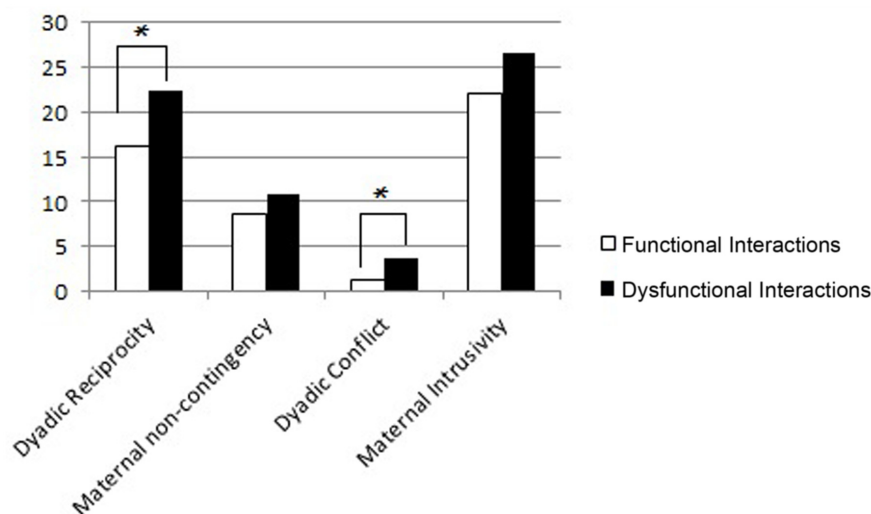
FIGURE 4 | Mean scores of dyads with functional and dysfunctional interactions at T2 in the four subscales of the Play Scale. The p-value is reported for the comparison between the dyads with functional and dysfunctional interactions (Mann–Whitney test for independent samples; *p < 0.05).
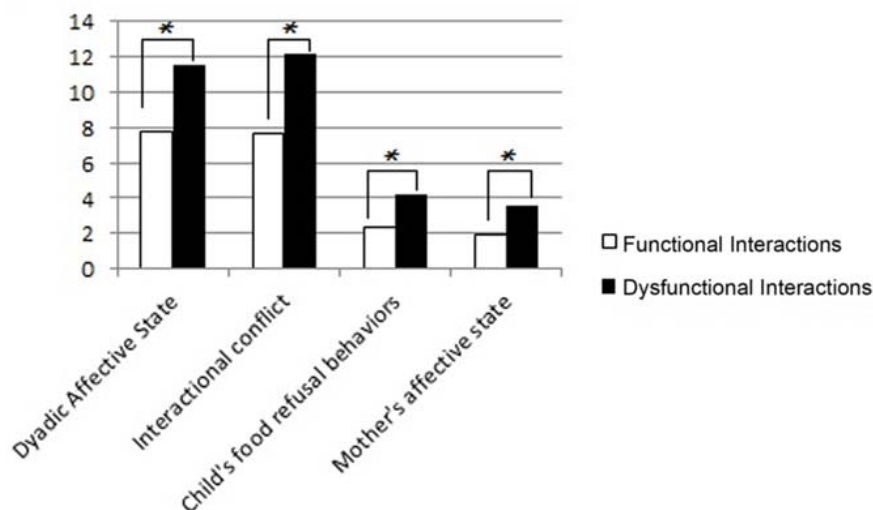
interactions vs. the dyads with dysfunctional interactions at T1 and T2. The results indicated that, at T1, the infants in the dyads with functional interactions showed higher scores in Initiating Joint Attention (Mann–Whitney U-test = 20, $p = 0.043$) and in Responding to Joint Attention (Mann–Whitney U-test = 14, $p = 0.010$), compared to the infants in the dyads with dysfunctional interactions (**Figure 5**).

At T2 (**Figure 6**), the infants in the dyads with functional interactions showed higher scores in Initiating Social Interaction (Mann–Whitney U-test = 23, $p = 0.05$), a class of social behaviors including very sophisticated social abilities, like for example offering a toy to the adult and/or reciprocity in the playful use of the objects. The results at T1 and T2 indicate higher social

abilities in the infants' belonging to the dyads with functional interaction.

To better explore the relationship between the quality of mother–infant interaction and the infants' social communicative abilities in the entire sample at T1 and T2, we correlate the infants' scores in the E.S.C.S. with the dyadic scores in the Feeding Scale and in the Play Scale. The results indicated negative significant correlations between the maternal affective state and the infants' ability to respond to joint attention ($r = -0.557$; $p < 0.05$) and between the interactional conflict and the infants' ability to both initiating ($r = -0.466$; $p < 0.05$) and responding ($r = -0.510$; $p < 0.05$) to joint attention at T_1. We found a negative correlation between the maternal affective state (the higher the score, the
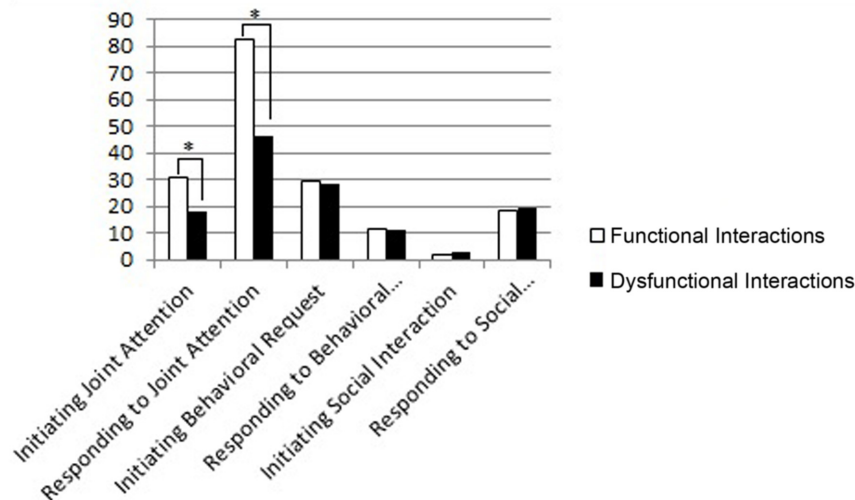
FIGURE 5 | Mean scores of dyads with functional and dysfunctional interactions at T1 in the subscales of the ESCS. The p-value is reported for the comparison between the dyads with functional and dysfunctional interactions (Mann–Whitney test for independent samples; *$p < 0.05$).
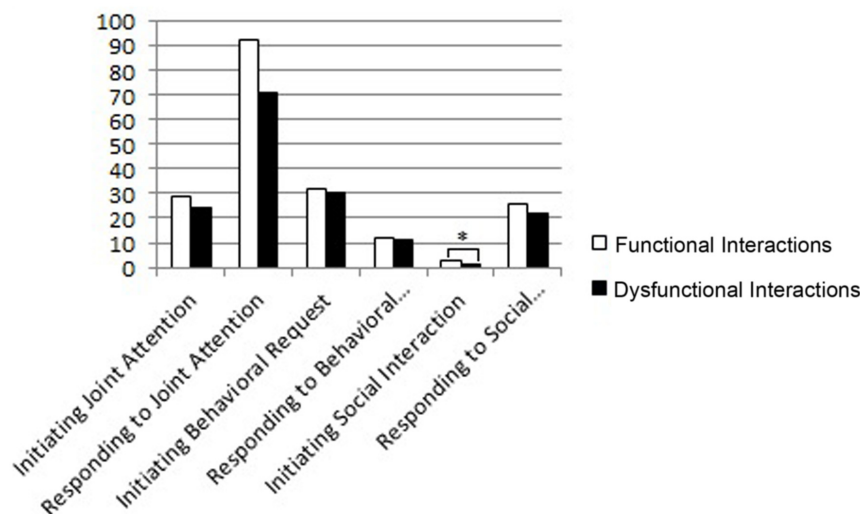
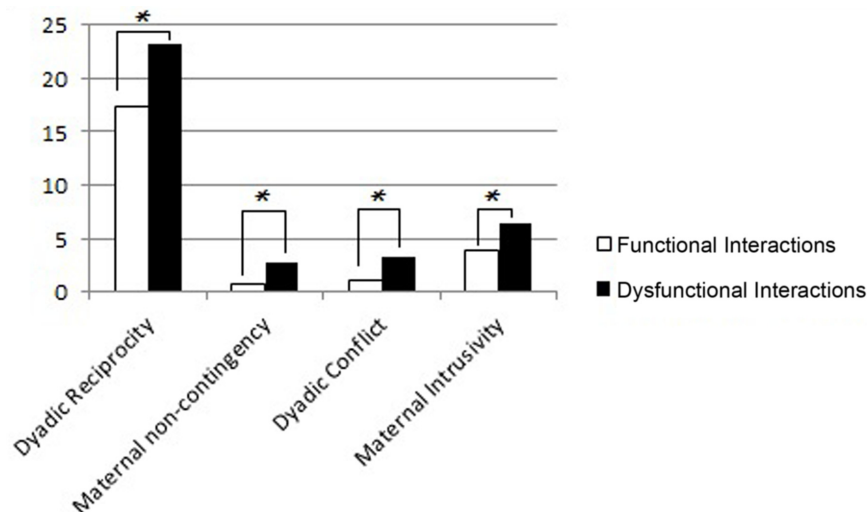**FIGURE 6 | Mean scores of dyads with functional and dysfunctional interactions at T2 in the subscales of the ESCS.** The p-value is reported for the comparison between the dyads with functional and dysfunctional interactions (Mann–Whitney test for independent samples; *$p < 0.05$).

higher the levels of anger and hostility) and the infants' ability to respond to social interaction ($r = -0.517$; $p < 0.05$). There were no significant correlations between mother-infant behaviors during play and the infants' social communicative abilities in the E.S.C.S. at T_1.

At T2, the interactional conflict between mother and infant during feeding was negatively correlated with the infants' ability to initiating social interaction ($r = -0.500$; $p < 0.05$). There was also a negative correlation between dyadic reciprocity (the higher the scores, the lower the dyadic reciprocity) during play and both the infants' ability to initiate ($r = -0.498$; $p < 0.05$) and to respond ($r = -0.541$; $p < 0.05$) to joint attention. The maternal non-contingency during play correlated negatively with

the infants' ability to respond to joint attention ($r = -0.453$; $p < 0.05$). These correlations, both at T1 and T2, seem to indicate that functional mother–infant interactions seem to promote and support higher socio-communication abilities in the infants.

DISCUSSION

This study explored the developmental trajectories of mother–infant interaction and extra-dyadic interaction with a stranger in the first 2 years of life.

The results indicated that both at T1 and T2 the dyads with dysfunctional interaction showed higher level of negative

affect and higher level of interactional conflict compared to the dyads with functional interaction. As the infants grew older, the dyads with dysfunctional interaction showed also more frequent infants' food refusal behavior and higher maternal distress. These results might be explained considering the growing infants social abilities, which might foster the child's food refusal behaviors with consequent increasing in the maternal distress. An alternative explanation might be related with the nature of the food consumed by the infants and the developmental feeding patterns. In fact, getting older, the infants are exposed to new tastes and more demanding tasks during feeding, like the use of the tools to eat. Unfortunately, we did not collected information about the infants' eating habits. This is certainly a significant mediating factor which needs to be included in further study.

When we considered mother–infant interaction during play, we found lower levels of sensitivity in the mothers of the dyads with dysfunctional interaction compared to the ones with functional interaction at T1. At T2, the dyads with dysfunctional interaction were as appropriate as the dyads with functional interaction in contingency and intrusivity. These results might be explained considering that the differences between the context of feeding and the context of play. We can speculate that, in the feeding contexts, sometimes the food might present some aversive characteristics for the child, like for example the consistency and/or the smell, which might elicit child refusals behaviors. Moreover, in this context, the need to feed the child might push the mother to behave in a more directive way, ignoring the protests of the child. On the contrary, during play the toys are usually pleasant and desired objects for the infants, and therefore they might be easily accepted by the child. Moreover, playing together is a self-fulfill activity, so that the mother doesn't feel any need to direct or redirect the child to achieve any particular goal rather than just having fun together. However, these interpretations are mere speculative, since we don't know anything about the eating routines of the children. In addition, we did not evaluated whether during play the mother felt or not any need to direct or redirect the child. Thus, new studies are necessary to confirm these explanations.

In line with previous studies (Stern, 1995, 1996), our study indicates a coherence in the quality of mother–infant interaction during feeding and play. The mothers of the dyads with dysfunctional interaction were insensitive to the infants' needs and communicative bids and showed negative affect in the course of the interaction in both contexts.

Our results also indicated a relationship between early socio-communicative abilities and the quality of mother–infant interaction over time. The infants in the dyads with functional interaction showed higher scores in Initiating Joint Attention and in Responding to Joint Attention compared to the infants in the dyads with dysfunctional interaction at T_1. At T_2, the infants in the dyads with functional interaction showed higher scores in Initiating Social Interaction, a class of social behaviors including very sophisticated social abilities, like for example offering a toy to the adult and/or reciprocity in the playful use of the objects. Moreover, we found significant negative correlations between the interactional conflict during feeding and the infants' socio-communicative abilities.

Our study also confirmed that intrusiveness and interdyadic conflict were negatively correlated with the infants' social abilities in interaction with an adult in an extra-dyadic context, as indicated by the few studies that investigated this relationship (Markus-Meyer et al., 2000; Crowson, 2001; Farhat, 2010; Fadda et al., 2014). We also found that this relationship is stable over time. Taken together, these results seem to indicate that the infants involved in mother–infant interaction characterized by more aversive interactional dynamics, like higher conflict and/or lower maternal sensitivity, might be at risk to develop pivotal social communicative abilities during infancy, in comparison with more adequate developmental patterns that were observed in infants belonging to functional dyads.

Overall, the preliminary results of our longitudinal study seem promising in further encouraging future research in order to reach a better understanding of the possible links between mother–child interactions and infants' social skills in extra-dyadic interactions.

Although it represents a novelty in the field of early mother–infant interactions explored, our current research shows also a series of limitations which could offer useful suggestions to implement future research. First, the number of children is quite limited. This hamper the possibility to generalize our results to a normal population. It might be of interest, in a future study, to investigate the same phenomenon in a large sample of participants and to investigate the same phenomenon with parametric statistical tests.

Moreover, the age range of participants at T_1 and T_2 is quite wide. This might have determined the influence in our results of an uncontrolled age effect, which needs to be specifically addressed in a future study. Moreover, this study rises a general issue on continuity vs. discontinuity. Even though we considered two separate moments in time, there was some overlapping in the age of the participants at T1 and T2. As a consequence, continuity in age might have exert a confounding effect in the differences between the two separate moments of time. For this reason, our current results need to be considered as exploratory and need further investigations. A future study should consider longitudinally infants more homogenous for age. Finally, other studies indicated the importance of the maternal mental model of the attachment relationship on the quality of mother–infant interaction (Ainsworth et al., 1971, 1978). Thus, attachment might be a significant mediating factor which needs to be considered in a future study.

CONCLUSION

We want to focus on the implications that this field of research might have to develop new programs of intervention, aimed to enhance and to strengthen caregiver–infant relationships, supporting the caregivers to cope with the developmental pathways and "touchpoints" (Brazelton and Greenspan, 2000; Sameroff, 2010) of a young child and to prevent dysfunctional mother–infant interactions at early age. In line with the latest

knowledge in this area (Berlin et al., 2005; Powell et al., 2014), our results seem to suggest that specific interventions, grounded on the framework of the attachment theory and on the empirical findings of the Infant Research, might enhance the quality of the early child–caregiver relationships and support early child development. These interventions might be a new promising way to help the caregivers to create a healthy environment for their children's social, emotional, physical, and cognitive development and, ultimately, their autonomy as adults (Powell et al., 2014).

AUTHOR CONTRIBUTIONS

RF and LL contributed to the conception and the design of this study. RF and LL organized the recruitment of the sample. RF collected, analyzed, interpreted and discussed the data, with particular attention to the results related to the "Early Social Communication Scales." RF wrote all the sections of the manuscript and she prepared the figures. LL reviewed and integrated all the sections of the manuscript. LL contributed to the interpretation of the results and to the discussion, with particular attention to the results related to the "Feeding Scale" and with the "Play Scale." All the authors reviewed the final version of the manuscript and approved it for publication.

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Mother-Toddler Play Interaction in Extremely, Very Low Birth Weight, and Full-Term Children: A Longitudinal Study

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Introduction: Although preterm birth represents a risk factor for early mother-infant interactions, few studies have focused on toddlerhood, an important time for the development of symbolic play, autonomous skills, and child's socialization competences. Moreover, no study has looked at the effect of birth weight on mother-child interactions during this period. Expanding on the available literature on prematurity, the main objective of this study was to explore the quality of mother-toddler interactions during play, using a longitudinal research design, as well as taking into account the effect of birth weight.

Method: 16 Extremely Low Birth Weight (ELBW), 24 Very Low Birth Weight (VLBW), 25 full-term children, and their mothers were recruited for the present study. Mother-child dyads were evaluated at 18, 24, and 30 months of child age. Ten minutes of mother-child play interaction were recorded and later coded according to the Emotional Availability Scales (EAS). Furthermore, the child's level of development was assessed through the Griffiths Scale, and its contribution controlled for.

Results: ELBW dyads showed an overall lower level of emotional availability, compared to VLBW and full-term dyads, but no main effect of birth weight was found on specific EA dimensions. Moreover, a significant effect of child age emerged. Overall scores, and Child Responsiveness and Involvement scores improved over time, independently of birth weight. Lastly, a significant effect of the interaction between birth weight and child age was found. Between 18 and 30 months, the overall quality of the interaction significantly increased in ELBW and VLBW dyads. Additionally, between 18 and 30 months, VLBW children significantly improved their responsiveness, while their mothers' sensitivity, structuring, and non-intrusive behaviors improved. In contrast, no change emerged in full-term dyads, although scores were consistently higher than those of the other groups.

Discussion: Birth weight affects the quality of mother-toddler interactions. Monitoring the relational patterns of preterm dyads during toddlerhood is important, especially in the case of ELBW children.

Keywords: emotional availability, ELBW, VLBW, toddlers, play

INTRODUCTION

Infants are considered born prematurely when they are born alive before 37 weeks of pregnancy are completed (March of Dimes et al., 2012). The scientific community has defined different categories to identify the severity of prematurity, based on birth weight and on gestational age, with worse outcomes for infants weighing <1000 g and born before 32 weeks of gestation (Goldenberg et al., 2008; Saigal and Doyle, 2008). Prematurity represents a serious risk factor for several crucial domains of infant life, including development (Bhutta et al., 2002), maternal mental health (Voegtline et al., 2010; Agostini et al., 2014; Neri et al., 2015), and the quality of the mother-infant relationship (Bozzette, 2007; Korja et al., 2012; Bilgin and Wolke, 2015).

In this regard, a number of studies have found poorer mother-infant interactions in preterm dyads compared to full-term ones (Forcada-Guex et al., 2006; Bozzette, 2007; Feldman, 2007; Potharst et al., 2012). In particular, preterm infants are described as less responsive and less involved in the interaction with their mothers, showing less vocalizations, eye contact and more emotional negativity than full term infants (Davis et al., 2003; Singer et al., 2003; Montirosso et al., 2010; Korja et al., 2012). Mothers of preterm infants have, in turn, been described as more intrusive than those of full-term infants (Goldberg and DiVitto, 2002; Forcada-Guex et al., 2006, 2011; Bozzette, 2007; Feldman and Eidelman, 2007), while findings on maternal sensitivity provide a more mixed evidence. Specifically, although some studies found mothers of preterm infants to be less sensitive than mothers of full term infants (Forcada-Guex et al., 2006, 2011; Korja et al., 2012), others failed to find significant differences (Montirosso et al., 2010; Agostini et al., 2014; Rahkonen et al., 2014; Bilgin and Wolke, 2015).

In light of these findings, assessing other emotion-related variables, which may typify the dyadic interaction, such as the concept of emotional availability (Biringen and Easterbrooks, 2012), would prove helpful in better understanding the quality of preterm mother-child interactions. Emotional availability identifies the dyad's ability to share a healthy emotional connection, and describes the emotional range displayed by both the adult and the child during the interaction. It considers the dyadic relationship rather than focusing only on specific behaviors, which may be influenced by environmental or cultural biases, and fail to detect the overall quality of the relationship (Biringen and Easterbrooks, 2012; Saunders et al., 2015).

The severity of prematurity is a risk factor for the quality of dyadic exchanges between mother and child. In particular, the presence of birth complications (Singer et al., 2003; Muller-Nix et al., 2004), low gestational age (Sansavini et al., 2011), and extremely/very low birth weight (Neri et al., 2015) negatively affect the mother-child relationship. For example, preterm infants with a birth weight below 1500 g experience more difficult interactions with their mothers, including a higher level of maternal intrusiveness (Agostini et al., 2014; Neri et al., 2015), compared to infants with a birth weight above 1500 g. To our knowledge, however, very little research has explored the influence of birth weight in the context of dyadic interactions. Further studies on this topic could help increase available

knowledge on preterm children's socio-emotional and cognitive developmental patterns (Righetti-Veltema et al., 2002; Beebe et al., 2011).

Furthermore, while most studies on prematurity have focused on the first year post-partum, little research has looked at mother-child interactions during toddlerhood (Forcada-Guex et al., 2006; Cho et al., 2008; Potharst et al., 2012; Salerni and Suriano, 2013).

A recent study by Salerni and Suriano (2013) found that preterm children, compared to full term children, showed lower levels of productivity during a play task with their mothers at 18 months, but not at 24 months. This study focused on symbolic play competences, but did not take into account other interactive patterns, such as the child's responsiveness and involvement, or maternal attitudes toward the child. To our knowledge, only one study, by Potharst et al. (2012), investigated maternal interactive behaviors during toddlerhood. This study showed that mothers of preterm children were less competent and supportive than those of full-term children, interfering with their child's autonomy, especially when the latter's development was impaired.

Despite the dearth of available studies, the second year of life represents an important period in child development, as it coincides with the development of new crucial competences, such as symbolic play, autonomous skills and active socialization (Piaget and Inhedler, 1969; McCune-Nicolich, 1981; Fonagy et al., 2001; Brazelton and Sparrow, 2006). Thus, it would be important to further explore whether the relational difficulties found during infancy also emerge at later ages.

The aim of the present study was, therefore, to explore emotional availability during play interactions between preterm children, in their second year of life, and their mothers. The rarely investigated effect of birth weight, and that of child age were taken into account. In line with literature, we hypothesized that lower birth weight would be associated with greater difficulties during mother-child play, despite a significant improvement in dyadic scores over time, both on the global level of emotional availability and on specific maternal and child behaviors.

Lastly, we explored the influence of the interaction between child age and birth weight on the quality of mother-child play interactions. Following our previous hypothesis, we expected an increase in the levels of emotional availability across all groups, but a greater improvement in full-term, compared to extremely, and very low birth weight dyads.

METHODS

Participants

Sixty-Five Families Participated in the Study

Forty preterm infants with birth weight below 1500 g and their mothers were enrolled during the follow up program of the Neonatal Unit of the Bufalini Hospital in Cesena (Italy), between March 2013 and March 2014.

Inclusion criteria for preterm infants were: gestational age <37 weeks, birth weight ≤1500 g, and the absence of major cerebral damages (intraventricular hemorrhage III or IV grade, periventricular Leukomalacia, retinopathy of prematurity, and Hydrocephalus) and genetic syndromes. Inclusion criteria for

parents were: being a normative parent, and having a Caucasian background.

All eligible families agreed to participate in the study. The Very Low Birth Weight (VLBW, birth weight between 1500 and 1000 g) group included 24 dyads, and the Extremely Low Birth Weight (ELBW, birth weight lower than 1000 g) group included 16 dyads.

Regarding the Control Group (CG), between April 2013 and April 2014, 60 mothers and their full term children were approached in preschools within the area of Cesena (Italy) and were asked to participate in the study. Inclusion criteria for full-term children were: gestational age >37 weeks, birth weight >higher than 2500 g, and the absence of cerebral damages and genetic syndromes. Inclusion criteria for CG parents were similar to those used for parents of preterm children.

Among the 60 full-term dyads initially approached, 34 mothers declined participation due to conflicting schedules. Of the 26 mothers who accepted to take part in the research, one dyad was excluded, due to major child health problems (i.e., epilepsy), hence, 25 dyads were included in the final CG.

Procedure

The study was approved by the Ethical Committee of the Department of Psychology, University of Bologna (Italy). The recruitment of preterm dyads occurred at 15 months of child's corrected age during a follow-up visit at the Bufalini Hospital (Cesena, Italy), where a psychologist explained the objectives and the procedure of the study. The same psychologist also introduced the research to the mothers of the CG at their children's preschools, and scheduled the first appointment with those interested in participating in the study.

Data were collected at 18, 24, and 30 months of child age (corrected age for preterm children). All assessments were organized following the same procedure and lasted about 1 h each. During the first assessment, mothers gave their written informed consent, they completed a form regarding their socio-demographic information, and were asked data on their child's birth and history.

Ten to twenty minutes of dyadic interactions was then video-recorded, to assess the mother-child interaction. Since mother-child play is a valid method for assessing the dyadic relationship, mothers were asked to engage in a semi-structured play with their child using two dolls (one representing the mother, the other representing the child) and some play-dough. This methodology was inspired by the Doll-Play Technique, which is largely used in clinical studies, for its ability to access the child's and the mother's inner world through play narratives (Murray et al., 1999; Pass et al., 2012).

Lastly, since literature highlights how mother-child interactions might be more difficult in the context of impaired child development (Potharst et al., 2012; Rahkonen et al., 2014), the Griffiths Scales (Griffiths, 1996) were used to evaluate child competences, at each assessment, in order to control for its possible influence on mother-child interactions.

Instruments

An *ad-hoc* questionnaire was created to collect infant information (gender, gestational age, length of hospitalization, twin status, type of delivery), and maternal socio-demographic data (e.g., age, nationality, marital status, education, occupation, parity). The socio-economic status (SES) of the family was calculated based on education and occupation of both parents, through Hollingshead's Index (Hollingshead, 1971).

All mother-child interaction videos were coded according to the Infancy/Early Childhood Version of the Emotional Availability Scales (4th edition) (EAS; Biringen, 2008). The EAS have been widely used in research, with both typical and atypical populations (Biringen, 2005; Wiefel et al., 2005; Saunders et al., 2015), including preterm infants (Zelkowitz et al., 2009; Patruno et al., 2015). They are used to measure the level of emotional availability in the parent-child relationship, which is defined as the emotional range displayed during the interaction by caregiver and child (Biringen and Easterbrooks, 2012). The EAS consist of six dimensions composed of seven subscales each. Four dimensions assess the adult's emotions and behavior (sensitivity, structuring, non-intrusiveness, non-hostility), and two focus on the child (responsiveness and involvement) (**Table 1**). A direct score is assigned for each dimension based on a 7-point Likert scale, with higher scores indicating more adequate interactive patterns.

In addition to the six dimensions, the EAS also offer an overall measure of caregiver-child emotional availability, through the EA Clinical Screener (Biringen, 2008). The EA Clinical Screener is an index of clinical relevance, which is assigned based on the overall interaction and describes the adult-child relationship on a 0–100 scale, giving a measure of relational risk: Scores between 100 and 81 indicate a healthy and emotionally available relationship (Emotionally Available); scores between 70 and 61 refer to a complicated relationship characterized by inconsistent adult and child behavior, such as pseudo-sensitivity in the adult, and negative attention seeking behaviors, dependency or over-connection in the child (Complicated Emotional Availability); scores between 60 and 41 indicate an avoidant relationship (Emotionally Unavailable/Detached); scores between 40 and 1 identify a very problematic, possibly traumatized relationship (Problematic/Disturbed) (Biringen, 2008). In line with literature (Licata et al., 2014, 2016; Baker et al., 2015) we used the Clinical Screener scores as a continuous variable, to assess the global level of mother-child emotional availability during play.

Two blind raters (P.S. and M.M.), trained to reliability in the use of the EAS, through the Biringen on-line EA training, coded all the videos. Both raters completed the criterion/reliability cases for the 4th edition of the Emotional Availability Scales, and achieved an acceptable level of reliability with the author. The degree of agreement between the two coders was measured on a random selection of 30% of the videos. The intraclass correlation coefficient between the two coders was found to be good for research purposes and ranged between 0.70 and 0.86 (mean = 0.80).

Child development was assessed using the Griffiths Mental Development Scales (GMDS, Griffiths, 1996), a well-recognized tool for measuring infant mental and psychomotor development

Maternal scales	
Sensitivity	Maternal ability to adequately respond to the child's cues during the interactions, and maternal positive affect. It includes the adult's positive affect, adequate perception of the child's emotions, acceptance of the child's behavior, flexibility, ability to handle conflicts, and awareness of timing.
Structuring	Maternal scaffolding capacity. It refers to the extent to which the adult is able to adequately guide the child during the interaction by taking care to follow the child's lead, setting limits for appropriate child behavior and/or misbehavior, establishing rules, and demanding compliance with rules. It takes into account both the provision of guidance, verbal and non-verbal, and the success of the adult's attempts.
Non-intrusiveness	Absence of over-directions, over-stimulations, interferences, or over protection in maternal behavior (i.e., commands, over-teaching, interferences with the child's play, verbal, or physical intrusion).
Non-hostility	Absence of covert or overt hostility towards the child. Hostile behavior includes verbal or physical aggressiveness like demeaning comments, impatience, boredom, critics, threats of separation, and introducing hostile play themes, or manipulating the child in a rough and violent way.
Child scales	
Responsiveness	Child's positive affectivity and appropriate responsiveness to the adult. It considers also the child's age-appropriate autonomy-seeking behavior, appropriate physical proximity to the adult, absence of role-reversal, lack of avoidance, and interest in the task of the play.
Involvement	Child's ability to actively engage with and involve the adult during the interactions. It evaluates the child's simple and elaborative initiative and takes into account the child's emotional or instrumental use of the adult, the lack of over-involvement, and the child's eye contact, body positioning, and verbal involvement with the adult.

in the clinical follow-up of preterm infants (Giannì et al., 2007; Biasini et al., 2012; Agostini et al., 2014; Neri, 2016). The scales evaluate six specific areas of child development: locomotor, personal-social, hearing and language, eye-hand co-ordination, performance and practical reasoning. Higher scores on each scale correspond to a better development in a specific cognitive domain. For each scale, percentile scores can be computed from raw scores. Percentile scores are sensitive measures to assess child improvement over time in chronic disorders, or neonatal follow-up programs (Griffiths, 1996).

Statistical Analysis

Statistical analysis was performed using IBM SPSS version 20.0 for Windows. A $p < 0.05$ was considered significant.

Descriptive analyses were run in order to verify homogeneity of the sample on socio-demographics and obstetrical variables (Pearson's X^2 Test, and Univariate ANOVA).

The effects of Birth Weight (ELBW, VLBW, and CG), Child Age (18, 24, and 30 months), and their interaction, on the EA Clinical Screener continuous scores and on the EA dimensions were then tested through Linear Mixed Models (LMMs, two levels, with random intercept). Bonferroni's *post-hoc* test was used for pairwise comparisons.

RESULTS

Descriptive Statistics

The maternal and child socio-demographic characteristics are shown in **Table 2**.

The three groups were homogenous with respect to child gender, maternal age, parity, occupation, family socio-economical level, and child global development level (**Table 2**).

Significant differences among groups emerged in gestational age $[F_{(2, 62)} = 245.657, p < 0.0001]$, length of hospitalization $[F_{(1, 36)} = 30.211, p < 0.0001]$, and twin birth $[X^2_{(1)} = 19.190,$

$p < 0.0001]$ (**Table 2**). These results were expected since these variables are strictly linked to premature birth.

With regards to maternal variables, differences were found in nationality $[X^2_{(2)} = 15.986, p < 0.0001]$, education $[X^2_{(4)} = 16.979, p = 0.002]$, and marital status $[X^2_{(2)} = 13.053, p = 0.001]$ (**Table 2**). Subsequent analyses showed that nationality and marital status did not significantly influence EAS scores. For this reason, these variables were not included in further analyses. On the contrary, education showed a significant association with the EAS and was, therefore, controlled in subsequent analyses.

In addition, taking into account previous literature showing the importance of child gender for early socio-emotional development, we investigated its effect on EA scales. No significant effect emerged on the Clinical Screener scores $[F_{(1, 192)} = 0.355, p = 0.55]$, or on any of the EA dimensions: Sensitivity $[F_{(1, 192)} = 0.442, p = 0.51]$; Structuring $[F_{(1, 192)} = 1.846, p = 0.18]$; Non-Intrusiveness $[F_{(1, 192)} = 0.036, p = 0.85]$; Non-Hostility $[F_{(1, 192)} = 0.0001, p = 0.99]$; Child Responsiveness $[F_{(1, 192)} = 0.150, p = 0.70]$; Child Involvement $[F_{(1, 191)} = 0.012, p = 0.91]$. As no significant difference emerged, we did not further control for this variable.

Mother-Child Interactions (EAS)

LMMs were run for the EA Clinical Screener, and for each EA dimension, in order to test the main effects of birth weight, child age and their interaction on mother-child play. The level of maternal education was always included as a control variable.

Birth Weight

A main effect of Birth Weight on the EA Clinical Screener scores emerged $[F_{(2, 53.703)} = 9.805, p < 0.0001]$ (**Table 3**). *Post-hoc* tests showed significantly higher scores in CG dyads, compared to VLBW ($p = 0.028$), and ELBW dyads ($p < 0.0001$).

No main effect of birth weight on specific EA dimensions was found (**Table 3**).

TABLE 2 | Infant and maternal socio-demographic and clinical characteristics.

	ELBW group (N = 16)	VLBW group (N = 24)	Control group (N = 25)	F/X^2	p
INFANT CHARACTERISTICS					
Gender					
Male, n (%)	5 (31.2)	12 (50.0)	15 (60.0)	3.235	0.198
Female, n (%)	11 (68.8)	12 (50.0)	10 (40.0)		
Gestational Age—weeks, m (sd)	27.67 (1.42)	30.13 (2.48)	39.67 (1.23)	245.653	<0.0001
Length of hospitalization- days, m (sd)	58.00 (13.74)	35.35 (11.50)	//	30.211	<0.0001
Twin status					
Yes, n (%)	1 (6.2)	11 (45.8)	0 (0.0)	19.190	<0.0001
No, n (%)	15 (93.8)	13 (54.2)	25 (100.0)		
Type of delivery					
Spontaneous, n (%)	4 (25.0)	3 (12.5)	18 (72.0)	19.940	<0.0001
Cesarean, n (%)	12 (75.0)	21 (87.5)	7 (28.0)		
GMDS general percentile score, m (sd)	54.12 (4.44)	55.34 (3.48)	59.83 (3.38)	0.670	0.515
MATERNAL CHARACTERISTICS					
Age, years, m (sd)	36.36 (7.62)	37.71 (3.90)	36.50 (4.86)	0.422	0.658
Hollingshead SES score, m (sd)	32.14 (18.23)	43.02 (15.87)	42.60 (16.14)	1.870	0.164
Nationality					
Italian, n (%)	10 (62.5)	24 (100.0)	24 (96.0)	15.986	<0.0001
Foreign, n (%)	6 (37.5)	0 (0.0)	1 (4.0)		
Marital status					
Married/Cohabiting, n (%)	12 (75.0)	24 (100.0)	25 (100.0)	13.053	0.001
Other, n (%)	4 (25.0)	0 (0.0)	0 (0.0)		
Education					
University, n (%)	3 (15.4)	13 (52.2)	19 (75.0)	16.979	0.002
High school, n (%)	7 (46.2)	10 (43.5)	4 (16.7)		
Primary/Secondary school, n (%)	6 (38.5)	1 (4.3)	2 (8.3)		
Occupation					
Employed, n (%)	13 (80.0)	24 (100.0)	23 (91.7)	5.062	0.080
Unemployed, n (%)	3 (20.0)	0 (0.0)	2 (8.3)		
Parity					
Nulliparous, n (%)	11 (68.8)	19 (79.2)	21 (84.0)	1.354	0.508
Multiparous, n (%)	5 (31.2)	5 (20.8)	4 (16.0)		

TABLE 3 | Mother-child interactive behaviors (EAS): differences among groups.

	Birth weight			Child age			F		
	ELBW (N = 16)	VLBW (N = 24)	CG (N = 25)	18 Months	24 Months	30 Months	Birth weight	Child age	Birth weight × Child age
EA clinical screener	70.391 (2.8)	79.181 (2.3)	87.025 (2.4)	75.757 (1.6)	78.930 (1.6)	81.910 (1.6)	9.805**	17.624**	3.122*
EA DIMENSIONS									
Maternal scales									
Sensitivity	5.195 (0.29)	5.199 (0.23)	5.503 (0.22)	5.253 (0.17)	5.228 (0.17)	5.415 (0.17)	0.675	1.581	2.667*
Structuring	5.190 (0.30)	5.040 (0.24)	5.241 (0.24)	5.071 (0.19)	5.027 (0.19)	5.372 (0.19)	0.223	2.772	2.658*
Non-intrusiveness	5.149 (0.27)	5.195 (0.21)	5.538 (0.21)	5.241 (0.17)	5.228 (0.17)	5.414 (0.17)	1,068	1.022	4.683**
Non-hostility	6.320 (0.18)	6.298 (0.14)	6.427 (0.14)	6.223 (0.11)	6.373 (0.12)	6.449 (0.12)	0.279	2.632	0.812
Child scales									
Responsiveness	4.918 (0.26)	5.204 (0.20)	5.488 (0.20)	5.007 (0.16)	5.129 (0.16)	5.474 (0.17)	1.749	6.261**	3.267*
Involvement	5.451 (0.26)	4.974 (0.21)	5.053 (0.21)	4.346 (0.16)	4.878 (0.17)	5.253 (0.17)	1.953	21.379**	0.916

*p < 0.05; **p < 0.005.

Child Age

A main effect of Child Age on the EA Clinical Screener scores also emerged [$F_{(2, 102.782)} = 17.624, p < 0.0001$] (**Table 3**): scores significantly increased from 18 months to 24 ($p = 0.007$) and 30 months ($p < 0.0001$), and from 24 to 30 months ($p = 0.015$).

With regards to the specific EA dimensions, main effects of Child Age emerged on Child Responsiveness [$F_{(2, 103.254)} = 6.261, p = 0.003$] and Involvement [$F_{(2, 104.526)} = 21.379, p < 0.0001$] (**Table 3**). For Child Responsiveness, 30 months scores were higher than 18 ($p = 0.002$), and 24 month ones ($p = 0.041$). Lower scores on the Child Involvement scale were found at 18 months compared to 24 ($p < 0.0001$) and 30 months of age ($p < 0.0001$), and at 24 months compared to 30 months ($p = 0.029$). We found no effect of Child Age on maternal Sensitivity, Structuring, Non-Intrusiveness and Non-Hostility scales.

Birth Weight and Child Age

A significant effect of the interaction between Birth Weight and Child Age was found on the EA Clinical Screener scores [$F_{(4, 102.767)} = 3.122, p = 0.018$] (**Table 3**). Specifically, at 18 months, scores of ELBW dyads were lower than those of VLBW ($p = 0.029$) and CG ($p < 0.0001$) dyads, and VLBW dyads showed lower scores than CG dyads ($p = 0.022$). At 24 months, ELBW dyads showed lower scores than VLBW ($p = 0.017$) and CG ($p < 0.0001$) dyads. At 30 months, however, ELBW scores were only lower than CG ones ($p = 0.019$).

When differences within groups were considered, in the ELBW group, scores were significantly higher at 30 months compared to 18 months ($p < 0.0001$) and 24 months ($p = 0.001$), whereas VLBW scores increased from 18 months to 24 ($p = 0.034$) and 30 months ($p = 0.041$) (**Figure 1**). No change over time was instead found in the full-term group, where scores showed substantial stability across all time points ($p > 0.05$).

The interaction between Birth Weight and Child Age was also significant for the following EA dimensions: Sensitivity [$F_{(4, 103.938)} = 2.667, p = 0.036$], Structuring [$F_{(4, 104.996)} = 2.658; p = 0.037$], Non-Intrusiveness [$F_{(4, 107.037)} = 4.683, p = 0.002$], and Child Responsiveness [$F_{(4, 102.982)} = 3.267, p = 0.014$] (**Table 3**). Only in the VLBW group, the scores significantly

FIGURE 1 | Interaction between birth weight and child age on the EA clinical screener scores.

increased from 18 to 30 months on maternal Sensitivity ($p = 0.013$), Structuring ($p = 0.050$), Non-Intrusiveness ($p = 0.002$) and Child Responsiveness ($p < 0.0001$), whereas no significant change was found in full-term or ELBW dyads (**Figure 2**).

No significant difference emerged in Non-Hostility and Child Involvement (**Table 3**).

Education

No effect of maternal education emerged on the EA clinical screener scores [$F_{(2, 53.610)} = 1.328, p = 0.274$].

An effect of maternal education was, however, found on Sensitivity [$F_{(2)} = 3.785, p = 0.029$], Non-Intrusiveness [$F_{(2)} = 4.740, p = 0.013$], Non-Hostility [$F_{(2)} = 4.111, p = 0.022$], and Child Responsiveness [$F_{(2)} = 3.741, p = 0.030$]: highly educated mothers (university degrees), compared to those with secondary school education, appeared more sensitive ($p = 0.024$), less intrusive ($p = 0.01$), and hostile ($p = 0.018$) and their infants were more responsive ($p = 0.032$). The latter mothers also showed lower Child Responsiveness scores than mothers with high school education ($p = 0.048$).

DISCUSSION

The main aim of the present study was to explore mother-child emotional availability during play in the second year of life comparing ELBW, VLBW, and full-term dyads.

Our first hypothesis, concerning the effect of birth weight on mother-child emotional availability, was only partially confirmed. On one hand, results showed that the ELBW group had the lowest scores on the Clinical Screener index and the full-term group the highest. The quality of the interaction, therefore, seems to worsen proportionally with the severity of birth weight, confirming our hypothesis. On the other hand, however, no difference on individual EA dimensions emerged among groups, in contrast to what we expected. This result raises questions on the methods used to assess mother-child interactions in the context of prematurity. The present findings seem to suggest that, during the second year of life, differences in mother-child interactions among birth weight groups may be more evident when interactions are considered globally rather than when focusing on specific maternal and child interactive behaviors. This explanation would be coherent with other studies, including a recent meta-analysis (Bilgin and Wolke, 2015), which failed to find differences between preterm and full-term groups in specific maternal patterns. Furthermore, it is possible that the interactive patterns of preterm dyads could improve over time, and that the differences observed at earlier ages (Forcada-Guex et al., 2006; Bozzette, 2007; Feldman, 2007; Korja et al., 2012) become less evident during toddlerhood.

Such explanation is in line with our findings, which showed that, across time, all groups had an increase in child responsiveness and involvement and in the overall quality of the interaction, thus supporting our second hypothesis. This could be explained by the fact that toddlerhood is a period characterized by many acquisitions (symbolic play, autonomous skills, and active socialization), which are shown by the child through the
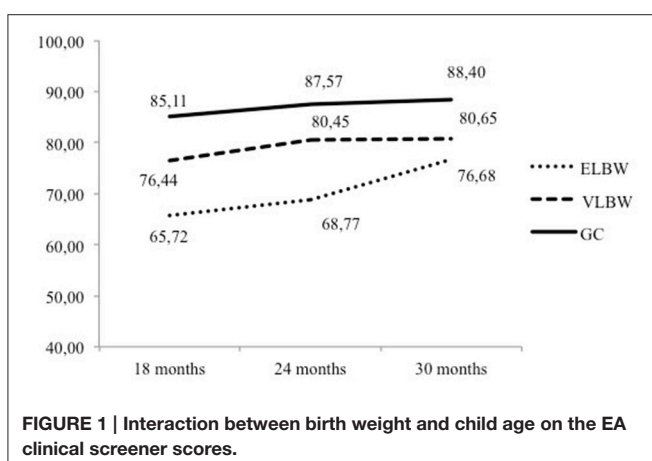
FIGURE 2 | Interaction between birth weight and child age on maternal sensitivity, maternal structuring, maternal non-intrusiveness, and child responsiveness scale. *Stands for significant effects with $p < 0.05$.
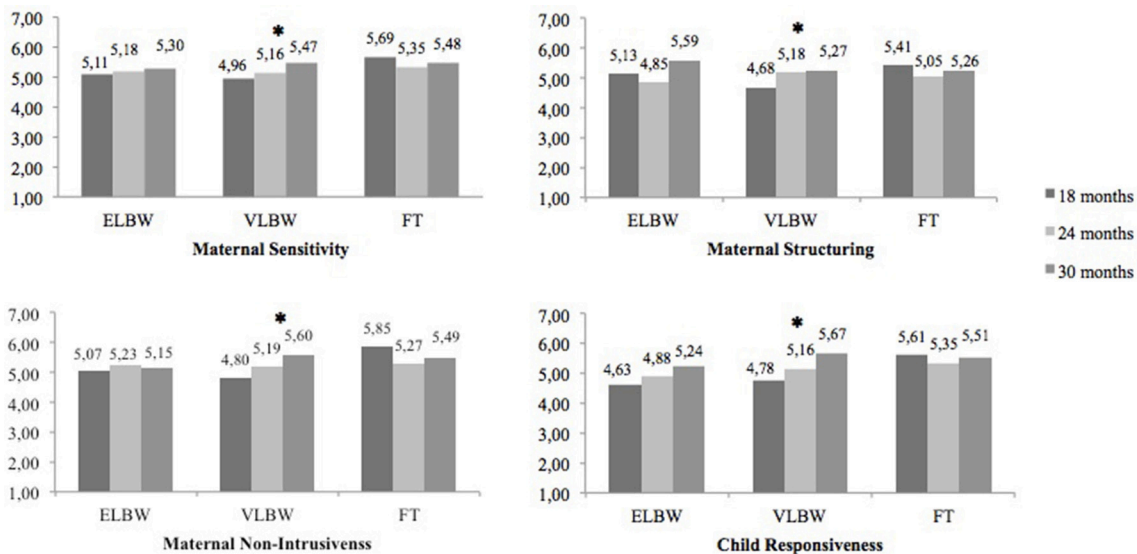
progressive development of a skilled play behavior (Piaget, 1972; Brazelton and Sparrow, 2006). Our results might reflect the natural evolution of the children's relational competences, which allow them to be more engaged during play. Considering the importance that age seems to play on child interactive behaviors, broader longitudinal studies should be carried out, to explore the evolution of child relational patterns across developmental stages, from infancy to toddlerhood.

Our second hypothesis was instead not confirmed in relation to EAS maternal dimensions. Maternal attitudes toward the child might characterize by a greater stability, as already highlighted by other studies (Bornstein et al., 2006; Stack et al., 2012).

Our findings related to the interaction between Child Age and Birth Weight, related to our third hypothesis, showed the presence of group differences in the development of mother-child interactions over time. Full-term group scores did not improve over time, in contrast to what we had hypothesized, although they remained higher than those of VLBW and ELBW dyads. Notably, a significant improvement in the overall level of mother-child emotional availability was instead seen in the VLBW and ELBW groups. Furthermore, we found an increase in maternal sensitivity, structuring, non-intrusiveness, and child's responsiveness in the VLBW group from 18 to 30 months. These results seem to indicate that, although, initially, VLBW and ELBW dyads experience more difficulties in mother-child interactions, in line with literature findings (Korja et al., 2012; Agostini et al., 2014; Neri et al., 2015), they seem to reach more adequate levels of emotional availability at the end of the second year of life. The second year of life might, therefore, represent a pivotal time for preterm dyads in their adjustment to the consequences of prematurity. Full-term dyads, instead, might have already found an adjustment, thus showing more stability in their behaviors throughout the second year of life. This explanation seems to be consistent with a recent Italian

study by Salerni and Suriano (2013). This study showed that preterm children increased their playing abilities from 18 to 24 months of corrected age, whereas full-term children did not show a significant improvement. The authors hypothesized that this phenomenon could be related to full-term children being advantaged by having already reached adequate interactive and play skills at 18 months. Preterm children, on the other hand, showing a delayed start compared to their full-term counterparts, had to catch up. Our study adds to these findings, by showing how the effect of prematurity might vary according to the child's birth weight, with only VLBW dyads showing an improvement in maternal sensitivity, structuring, non-intrusiveness, and child responsiveness. Furthermore, while VLBW dyads showed an improvement in overall mother-child emotional availability as early as between 18 and 24 months, ELBW dyads only showed this between 24 and 30 months. This might suggest that ELBW dyads need more time to adjust to the traumatic effect of premature birth, compared to VLBW. These findings seem to support the idea that ELBW dyads may struggle more than VLBW dyads, due to the greater fragility of these children. With regards to this, previous studies (Stern and Karraker, 1990; Stern et al., 2006; Patruno et al., 2015) have shown how mothers of preterm children tend to have a stereotyped perception of their infants, seeing them as weak and vulnerable. This perception, which can affect the quality of mother-child interactions, could be stronger, and more persistent in time, in mothers of ELBW children, compared to VLBW ones. Further investigations should be conducted to confirm this explanation, and future studies should consider maternal perception of the child when evaluating mother-child interactions in the context of prematurity.

With respect to the individual EA dimensions, it is interesting to note that Non-Hostility scores, in contrast to the other dimensions, were high for all groups and at all time points, and

variability was lower than in other scales. This could be due to several reasons: A first possible explanation is that a low-stress context of observation like the one used in our study may have reduced the possibility of detecting hostile maternal behaviors. This would be consistent with a recent review by Biringen et al. (2014), which highlighted the small number of studies reporting significant findings on Non-Hostility, due to the limited use of stressful contexts of observation, or of periods of observation long enough to capture moments of stress or loss of control in the adult. In relation to this, a second reason might be linked to the duration of mother-child interactions. In line with literature and the EAS guidelines (Biringen, 2008), mother-child interactions in our study were videotaped for 10–20 min, yet it is possible that this length of time was not enough to observe a stressful situation in a low-risk sample, such as the one examined. As shown in other studies, high levels of maternal hostility are often associated with high-risk contexts, such as disadvantaged communities, previous histories of abuse and maltreatment, or of substance abuse (Little and Carter, 2005; Bornstein et al., 2006; Moehler et al., 2007; Stack et al., 2012; Porreca et al., 2016). Our sample was mostly composed of middle-class women, living or cohabiting with their child's father, and without any diagnosed psychiatric disorder or major health issue. Hence, both the study setting and the characteristics of our sample might have limited the possibility of detecting significant differences and associations related to Non-Hostility scores. Compared to situations of higher risk, with low risk samples, a longer duration of the observation or the use of more specific instruments could help to better detect differences in the levels of hostility displayed by mothers.

Overall, these results seem to underline how VLBW and ELBW dyads reached more adequate levels of emotional availability at the end of the second year of life. However, it is noteworthy that the specific characteristics of the sample, which only included healthy preterm children (without cerebral damages or syndromes), may have biased these results. Moreover, all preterm dyads were recruited during the follow-up program of the Bufalini Hospital (Cesena, Italy), a non-structured intervention during which parent-child interactions were assessed and psycho-educational recommendations were given to promote adequate parental behaviors. Results on the Griffiths scales seem to support the positive effects of the program, given the absence of developmental difference among birth weight groups. Hence, this intervention might have positively influenced the quality of the dyadic play observed in this study. Future research should explore the direct effect of follow-up programs on mother-child play interactions.

Finally, our study detected an effect of maternal education on dyadic interactive behaviors. Although investigating the effect of education was not an objective of this study, this effect is consistent with literature findings (Holditch-Davis et al., 2007; Bigelow et al., 2010; Potharst et al., 2012), and underlines the need of considering maternal characteristics in future studies.

The present study has a number of strengths, including its focus on the effect of birth weight and on toddlerhood, a period so far poorly investigated, and its use of the Doll-Play methodology, with its rich evaluation of the relationship between the mother and the child. The structured context of play, in fact, elicits the expression of maternal and child internal representations during the interaction (Murray et al., 1999; Pass et al., 2012).

Although our study adds relevant and promising results to the literature, some limitations should be considered. First, due to the small sample size, further investigations on wider samples should be undertaken to confirm our findings. Moreover, while this study only focused on the role of mothers during play, recent literature on early interactions shows the relevance of fathers for child development. Therefore, future studies should extend our results by taking into consideration father-child interactions, during the second year of life. Finally, as maternal depression and anxiety could influence maternal interactive behaviors during the first year after preterm birth (Zelkowitz et al., 2009; Vigod et al., 2010; Neri et al., 2015), such variables should be taken into account and controlled for by future studies.

The findings here reported have important clinical implications, as they suggest how special attention should be paid to mother-child interactions in ELBW and VLBW dyads during the second year of life, a period that represent a pivotal time for the adjustment to preterm birth. Monitoring the quality of dyadic interactions is important to support and enhance the onset and structuring of the relationship between mother and child.

AUTHOR CONTRIBUTIONS

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Mother-Child Play: A Comparison of Autism Spectrum Disorder, Down Syndrome, and Typical Development

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The purpose of the present study was to analyze mother-child collaborative play in children with Autism Spectrum Disorders (ASD) compared to children with Down Syndrome (DS) and typical developing children (TD). Children with ASD are often described as having deficient play skills, particularly in the symbolic domain. Caregivers' involvement in child play activities increases the structural complexity of playing in both typically developing children and children with disabilities. Participants included 75 mothers and their children with ASD ($n = 25$), with down syndrome ($n = 25$) and with typical development ($n = 25$). Mother–child play sessions were analyzed using a coding system for exploratory and symbolic play. Results indicated that children with ASD showed more exploratory play compared to children in the other groups. No significant differences emerged between the three groups for child symbolic play or for mother play. These findings are discussed in relation to the debate about functional and symbolic play in children with ASD and in relation to the importance of setting and age for play assessment.

Keywords: Down Syndrome, Autism Spectrum Disorder, play skills, mother–child interaction

INTRODUCTION

The Development of Play

Play allows children to learn and practice new skills in supportive conditions and is essential for child development (Boucher, 1999). While engaging in play activities, children develop not only motor skills but also cognitive and social skills (e.g., Bornstein and O'Reilly, 1993; Venuti et al., 2008). Moreover, appropriate play behaviors provide the opportunity for social interaction and vice versa (Piaget, 1962; Bretherton, 1984; Hobson et al., 2009). Play shows a universal developmental path; from manipulative and functional exploration to symbolic and pretend play. Children at first typically involve in exploratory play activities which are tied more closely to the physical properties of toys, and later they engage in symbolic play actions which rely on representational abilities. More specifically, very young children's object play is characterized by exploratory sensorimotor manipulation whose aim is to extract information about objects characteristics. Successively, children's play shows symbolic qualities and begins to represent experiences.

The manifestation of symbolic representation in children's play has been observed to occur between 12 and 24 months of age (Cote and Bornstein, 2009; Lillard et al., 2012). Symbolic play repertoires include simple pretense about self and about others, sequences of pretense, and substitutions in pretense. Pretend play is when a child projects a mental representation onto reality in a spirit of fun. When children pretend, three different cognitive skills can be observed: attributing proprieties to objects, making references to absent objects or places, using objects as something

else (i.e., object substitution). The developmental trajectory of play is associated with the emergence of children new cognitive skills. Indeed, child play and developmental age tend to be strongly associated in typically and atypically developing children (Hill and McCune-Nicolich, 1981; Beeghly and Cicchetti, 1987; Tamis-Lemonda et al., 2002). Changes in play skills and cognitive development often co-occur, especially regarding the transition from concrete to symbolic functioning (El'Konin, 1999); language and symbolic play emerge concurrently, and important progresses in either domains emerge at similar points in the first 2 years of life (Spencer, 1996). Gould (1986) found that scores on the Bayley Scales of Infant Development were positively correlated with ratings of play and language abilities, concluding that while often overlapping greatly with non-verbal cognitive abilities, language represents a separate cognitive domain, and may have a unique role in the development of play. Several other studies have identified strong positive correlations between either receptive or expressive language and play in typical children and atypically developing children (e.g., Mundy et al., 1987; Lewis and Boucher, 1988; Spencer, 1996; Musatti et al., 1998).

Starting from the study of the developmental progression of play, Bornstein and O'Reilly (1993) operationalized a scale for play behavior that followed a progression from simple manipulation of toys, to recognition of conceptual relationships between objects (i.e., functional play and combinatory play), to increasingly decontextualized play (i.e., symbolic or pretend play). The results suggested that children's play was a valid and reliable way to evaluate progressively complex and cognitively demanding behaviors (Lifter et al., 1993; Lifter, 2000).

Play in Children with ASD

To date the specific characteristics of play behaviors of children with Autism Spectrum Disorder (ASD) have not been conclusively explored and are still at the center of a vivid scientific debate encompassing different and crucial topics such as diagnosis and intervention (Sigman and Ungerer, 1984; Williams et al., 2001; Hobson et al., 2009). Deviations in play behavior in children with ASD can be detected in the 1st year of life (Ungerer and Sigman, 1981; Van Berckelaer-Onnes, 2003) and are evident through all phases of play development. Pretend play deficits are so commonly recognized in ASD that a failure to use toys symbolically is considered in the main diagnostic systems for ASD (e.g., Autism Diagnostic Interview-Revised; Rutter et al., 2003) (Ungerer and Sigman, 1981; Sigman and Ungerer, 1984). Ungerer and Sigman (1981) and Sigman and Ungerer (1984) reported that children with ASD had lower occurrence and less variety of functional play acts, less pretend doll play and shorter play sequences; therefore, indicating a limited capacity of symbolic play in children with ASD. Williams et al. (2001) found that when children with ASD show symbolic play they miss the spontaneous and innovative components of symbolic play which is instead replayed in a learned routine.

However, scientific studies on ASD have demonstrated difficulties at various levels of play and not only in pretense. Some studies have described the first phase of play development in children with ASD as characterized by a number of unusual features. Play behaviors of children with ASD are often focused

on a limited selection of objects (Van Berckelaer-Onnes, 2003), or even on a specific part of a single object (Freeman et al., 1979). Some researches have shown that children with ASD produce the same number of functional acts as typically developing (TD) children under spontaneous as well as structured conditions (e.g., Baron-Cohen, 1987; Lewis and Boucher, 1988; Van Berckelaer-Onner, 1994; Charman and Baron-Cohen, 1997; Libby et al., 1998; Williams et al., 2001) but they spend significantly less time playing functionally than TD children (Sigman and Ungerer, 1984; Lewis and Boucher, 1988; Jarrold et al., 1996). Williams et al. (2001) found that children with ASD engaged in functional play acts on a small variety of objects compared to children with DS and TD children.

On the other hand, some studies found more similarities than differences in play of children with ASD when compared to typically and atypically developing peers. Dominguez et al. (2006) reported no differences in the proportions of functional or symbolic play in a group of children with ASD, related to TD children, matched on chronological age, however, children with ASD showed less interest in specific types of objects and more exploratory and sensorimotor play. Warreyn et al. (2005) examined spontaneous symbolic play in 3–6 years old children with ASD in interaction with their mothers compared to a control group (including children with language delay and children with a developmental delay) matched on age and IQ. They found similarities in the symbolic play level of children with ASD and mental-age matched children.

Some studies have found a relationship between language and symbolic play in children with ASD. For example, children with ASD who engaged in symbolic play had significantly higher verbal mental age than those who did not (Baron-Cohen, 1987). Sigman and Ungerer (1984) reported that receptive and expressive language were related to the play of children with ASD though only receptive language was related to play skills in children with typical development and children with intellectual disabilities.

Maternal Behaviors during Play

The mother may play an important role on the quantity and quality of child play behavior (Naber et al., 2008). Children can improve their play skills with more competent partners, such as parents, who can imitate and prompt their children's actions (Riquet et al., 1981; Sigman and Ungerer, 1984; Ginsburg, 2007).

Differences in children's maturing cognitions and behaviors are mediated by their parents' promotion of play and there is strong evidence that an adult partner's participation in child play enhances its complexity, duration, and frequency (Bornstein et al., 1996, 2002; Venuti et al., 2008). Children spontaneously initiate play sequences, but they also imitate and learn from the play they see (e.g., Užgiris et al., 1989). Indeed, adults engage in many different roles in shaping children's object and representational play; they themselves can play in ways children observe and learn from, they are able to induce play, and they can provide supports for play. Moreover, in demonstrating play, the mother provides her child with information about how to engage in particular activities by modeling the action. The mother can also use language to solicit the play of her child.

In soliciting, a mother places the onus for play on the child by verbally encouraging (but not modeling) the child's participation in specific play activities (Bornstein et al., 2002).

In spite of the limited social skills of children with ASD, mothers of children with ASD exhibit an equal number of social approaches to their child, and have been shown to be as sensitive and responsive as mothers of other intellectually delayed and TD children (Brooks-Gunn and Lewis, 1984; Doussard-Roosevelt et al., 2003; van Ijzendoorn et al., 2007). A relevant aspect emerging consistently in the literature on parental interaction with children with ADS is the directive style of the mothers. In line with this aspect, Kasari et al. (1988) examined parent–child interactions in children with ASD compared with children with other intellectual disabilities and developmentally matched typically developing children. The results showed that caregivers of ASD children were similar to the other caregivers in their responsiveness to child non-verbal communication bids and did not differ in their engagement in mutually sustained play. However, parents of children with ASD used control strategies more frequently than parents of TD children, and they held their children physically on task more often while mothers of children with intellectual disability pointed more often to objects. In this study (Kasari et al., 1988) individual differences within the ASD sample were found indicating that mothers regulated their children's behavior less and showed more mutual play and positive feedback to more communicatively able children with ASD. In other studies, Lemanek et al. (1993), Doussard-Roosevelt et al. (2003), observing mothers and their preschool children with ASD in play sessions, reported that the quantity of parental initiatives did not differ from what was observed in mothers of typically developing preschoolers. However, mothers of children with ASD used more physical contacts, more high intensity behaviors, and fewer social verbal approaches with their children with ASD.

The main purpose of the present study was to analyze mother-child collaborative play in children with ASD. We aimed to look at several features of exploratory and symbolic play in children with ASD compared to a group of mental age-matched typically developing children (TD) and children with Down Syndrome (DS). We had the following aims and hypotheses:

(1) We aimed to analyze child exploratory play according to the different levels of its complexity. We expected that children with ASD would engage more in exploratory play compared to the control groups and especially in unitary functional activity, in line with their tendency to engage in repetitive behaviors.

(2) We aimed to analyze child symbolic play according to the different levels of its complexity. We expected that children with ASD would show less complex symbolic play behaviors compared to the control groups.

(3) We aimed to compare maternal play in the three groups during play in terms of mothers' demonstrations and solicitations of the play. As mothers usually adapt their play to their children's level of play, we expected that mothers of each group of children would follow the play of their children. We expected mother of children with atypical developmental (ASD or DS) to show more solicitations than mothers of children with TD because mothers of children with atypical developmental are often reported to be more directive.

(4) We aimed to analyze the associations between maternal demonstrations and solicitations and child play. Considering the well documented scaffolding role of mothers during collaborative play, we expected positive correlations between maternal and children behaviors.

MATERIALS AND METHODS

Participants

A total of 75 children and their mothers participated in this study. The index group consisted of 25 children with ASD and their mothers. The control groups consisted of: (a) 25 mental-age-matched typically developing children and their mothers; (b) 25 children with DS and their mothers (See sociodemographic information in **Table 1**). All children with DS had the Trisomy 21 type, confirmed by chromosomal analysis. No mental age data were available for the control group, but interviews with parents, examination of health records, and observations during the study all indicated that they were developing typically. We also had two other converging kinds of data on children in the TD sample: (a) data on the Vineland Assessment of Behavioral Adaptation (Sparrow et al., 1984) showed that children fell within the normal range ($M = 102.72$, $SD = 11.66$), and (b) data from a longitudinal study showed that children had IQs in the normal range ($M = 103.48$, $SD = 7.07$) at 48 months. Multivariate analyses were conducted on chronological age, mental age and mother age. Only chronological age was significantly different between the three groups.

The diagnosis of participants with ASD was confirmed through clinical judgment by an independent clinician based on the DSM-IV-TR criteria (American Psychiatric and Association, 2000) for ASDs as well as through the Autism Diagnostic

TABLE 1 | Mean (M), standard deviation (SD), and coefficient of variation (CV) of the demographic characteristics.

Child and mother characteristics	Autism Spectrum Disorder			Down Syndrome			Typical development		
	M	*SD*	*VC*	*M*	*SD*	*VC*	*M*	*SD*	*VC*
Mental age (months)	24.21	9.82	0.38	21.12	4.39	0.22	20.01	0.21	0.01
Chronological age (months)	43.33	7.62	0.18	36.68	8.71	0.24	20.01	0.21	0.01
Mother's age (years)	36.81	3.73	0.10	35.43	6.18	0.17	25.43	6.12	0.24
Social economic status	37.80	13.26	0.35	20.84	10.04	0.48	21.48	5.59	0.26

Observation Schedule (ADOS – Lord et al., 2002). Modules 1 and 2 were used for all the subjects and all the children passed the cut-off for the ASD. The Griffith Mental Developmental Scale (2nd Ed., Griffiths, 1996) was used to determine the developmental ages of children with atypical development. The socio-economic status (SES) of the families, calculated with the Four-Factor Index of Social Status (Hollingshead, 1975), indicated a low status in family with children with TD and family with children with DS; family with children with ASD showed a middle-low status. A group effect emerged between groups in socio-economical level $F(2,72) = 4.2$ $p < 0.001$. Informed consent was obtained from all parents. The study was approved by the Ethic Committee for Experiments Involving Human Beings of the University of Trento.

Procedure

The present study followed a standardized protocol. Data were collected during 10-min play sessions video recorded continuously by a female observer. Observations took place at the Intervention Center in a small, quiet room, which was familiar to the participants. The findings of previous studies using 10-min observations of play lend credence to the validity of these temporal parameters (see Bornstein et al., 1996; Bornstein and Tamis-LeMonda, 1997; de Falco et al., 2008, 2010; Bentenuto, 2012).

During the session, the mother was asked to play with her child as she typically would with a set of standard, age-appropriate toys (doll, blanket, tea set, toy telephone, toy train, two small picture books, foam ball, and set of nesting barrels). This set of toys, used in previous researches (Bornstein et al., 2002; Tamis-Lemonda et al., 2002; de Falco et al., 2010) allows for different play behaviors ranging from exploration to pretense (see Bornstein and O'Reilly, 1993).

Play Code

As described in **Table 2**, the play code consisted of a mutually exclusive and exhaustive category system that included eight levels and a default (no play) category (see Bornstein and O'Reilly, 1993; Tamis-LeMonda and Bornstein, 1996); these play levels derived from previous researches on the progressive nature of play across the 1st years of life. Play was coded continuously by noting play levels as well as beginning times and end times (accurate to 1 s). Levels 1–4 constitute the macrocategory Exploratory play and Levels 5–8 constitute the macrocategory Symbolic play. For each level, four measures were calculated: the absolute frequency, the proportion frequency, the absolute duration, and the proportion duration. As these measures have been found to be consistently highly correlated in previous studies (see Bornstein et al., 1996), their mean standard score was used as a summary index representing the amount of each play level and each macrocategory (within each group of participants). The summary indexes, by considering frequencies and duration at the same time, controls the risk of results misinterpretation due to repetitive behaviors (high frequencies and short duration) or preservative behaviors (low frequency and long duration) known to occur in children with intellectual disabilities. Moreover, the use of the summary indexes, taking into account the proportion

TABLE 2 | Play coding scheme.

Play levels	Description
Exploratory play	
(1) Unitary functional activity	Production of effects to a single object (e.g., dialing a telephone)
(2) Inappropriate combinatorial activity	Inappropriate juxtaposition of two or more objects (e.g., putting the ball on the telephone)
(3) Appropriate combinatorial activity	Appropriate juxtaposition of two or more objects (e.g., putting the handset on the telephone base)
(4) Transitional play	Approximated pretense but without confirmatory evidence (e.g., putting the telephone handset to ear without vocalization)
Symbolic play	
(5) Self-directed pretense	Pretense activity directed toward self (drinking from an empty cup)
(6) Other-directed pretense	Pretense activity directed toward someone or something else (e.g., putting a doll to sleep)
(7) Sequential pretense	Linking two or more pretense actions (e.g., pouring into an empty cup from the teapot and then drinking)
(8) Substitution pretense	One or more object substitutions (e.g., pretending a cup is a telephone and talking into it)
Default	Not engaged in any of the above behaviors

of exploratory/symbolic play of the total duration of the session, controls for differences in the time each child spent engaged in play during the observed sessions (range: 480–600 s). The play code was applied to the child's play and also to the mother's demonstrations and solicitations of play. In demonstrating play, the mother offers to her child information about how to engage in specific activities by modeling the action.

Maternal Solicitations

In soliciting, the mother places the onus for play on the child by verbally encouraging (but not modeling) the child's participation in specific play activities. Solicitations are defined as utterances which encourage the child to engage in a specific play activity when the child and mother are playing together (Bornstein et al., 2002). Each solicitation is coded for its level of play sophistication using the levels defined in the play code. Because solicitations are verbalizations, frequency measures (absolute and proportional) were calculated: the mean standard score (within each group of participants) of these two indices was used as a summary index representing the amount of either mother solicitations of exploratory or symbolic play. However, for the most part, solicitations only occur at play levels 1, 3, 5, and 6. Rarely would mothers solicit their children to perform inappropriate combinations (level 2), transitional play (level 4), sequences (level 7) or substitutions (level 8).

Interobserver Agreement

For each of the two codes, coding was carried out by two professional research assistants who were blind to hypotheses and purposes of the study and to additional information about the dyads (however, DS was easily detectable by visual inspection). Each coder was first trained to reliability (kappa; Cohen, 1960) on consensus coding. Average *kappas* between each pair of coders

was calculated on 40% of the sessions and ranged from 0.74 to 0.81 for the Play code and from 0.75 to 0.82 for the Maternal Solicitations coding.

Analytic Plan

We first conducted preliminary analyses of the data. Then, we reported descriptive statistics for child and for mother play in the three groups. To test our hypotheses about child play and mother play, one-way analyses of variance ANOVAs with group (ASD vs. DS vs. TD) as between-subject factor were used on the summary indexes of mother play and child play macrogategories. *Tukey post hoc tests* were used as *post hoc* tests and follow-up analyses on the eight play levels were carried out via separate ANOVAs, using Bonferroni *p*-value adjustment. Pearson correlation analyses were carried out to investigate associations between mother solicitation and child play.

RESULTS

Preliminary Analyses

Prior to data analysis, all dependent variables and potential covariates were examined for normalcy, homogeneity of variance, outliers and correlations among variables (Fox, 1997). As noted in the description of the sample, group's differences emerged in chronological age and social economic status so these variables were evaluated as potential covariate by examining their correlations with all dependent variables. No consistent patterns of significant correlations were found.

Descriptive Statistics

Table 3 presents descriptive statistics of play's indexes for child play by group. **Table 4** present descriptive statistics for mother play by group. **Table 5** presents descriptive statistics for frequencies of maternal solicitation behaviors.

Child Play

Results showed a statistical difference among children for exploratory play, $F(2,72) = 3.9$; $p < 0.05$. Tukey HSD *post hoc*

TABLE 3 | Descriptive statistics for child play.

	Autism Spectrum Disorder M (SD)	Down Syndrome M (SD)	Typical development M (SD)
Exploratory play	0.29 (1.49)	−0.11 (0.66)	0.17 (0.83)
(1) Unitary functional activity	1.67 (2.09)	0.49 (0.78)	0.73 (0.86)
(2) Inappropriate combinatorial activity	−0.44 (0.30)	−0.38 (0.36)	−0.20 (0.62)
(3) Appropriate combinatorial activity	0.25 (1.3)	−0.15 (0.68)	0.36 (0.82)
(4) Transitional play	−0.31 (0.39)	−0.42 (0.28)	−0.19 (0.61)
Symbolic play	−0.18 (0.79)	−0.12 (0.68)	−0.05 (0.69)
(5) Self-directed pretense	0.07 (0.85)	0.02 (0.69)	0.23 (0.80)
(6) Other-directed pretense	−0.12 (0.92)	−0.29 (0.34)	−0.12 (0.42)
(7) Sequential pretense	−0.11 (0.74)	0.28 (0.96)	0.22 (0.86)
(8) Substitution pretense	−0.55 (0.00)	−0.52 (0.11)	−0.54 (0.09)

TABLE 4 | Descriptive statistics for mother play.

	Autism Spectrum Disorder M (SD)	Down Syndrome M (SD)	Typical development M (SD)
Exploratory play	0.27 (1.32)	−0.08 (0.79)	0.22 (1.04)
(1) Unitary functional activity	1.58 (1.27)	0.69 (0.94)	0.82 (1.01)
(2) Inappropriate combinatorial activity	−0.56 (0.01)	−0.55 (0.06)	−0.33 (0.42)
(3) Appropriate combinatorial activity	0.33 (1.36)	0.09 (0.75)	0.99 (1.19)
(4) Transitional play	−0.48 (0.19)	−0.55 (0.06)	−0.44 (0.25)
Symbolic play	−0.12 (0.77)	−0.08 (0.76)	−0.22 (0.65)
(5) Self-directed pretense	−0.40 (0.32)	−0.31 (0.50)	−0.33 (0.50)
(6) Other-directed pretense	0.38 (1.14)	0.24 (0.93)	0.07 (0.66)
(7) Sequential pretense	0.05 (0.67)	0.26 (0.89)	−0.11 (0.89)
(8) Substitution pretense	−0.50 (0.23)	−0.46 (0.22)	−0.51 (0.19)

TABLE 5 | Descriptive statistics for maternal solicitation behaviors.

	Autism Spectrum Disorder M (SD)	Down Syndrome M (SD)	Typical development M (SD)
Exploratory play			
(1) Unitary functional activity	3.68 (3.67)	5.88 (7.38)	4.24 (3.85)
(2) Inappropriate combinatorial activity	–	–	–
(3) Appropriate combinatorial activity	3.20 (4.91)	2.68 (4.85)	3.76 (6.52)
(4) Transitional play	–	–	–
Symbolic play			
(5) Self-directed pretense	4.76 (5.59)	4.68 (3.71)	8.68 (5.35)
(6) Other-directed pretense	5.96 (6.19)	7.24 (6.19)	4.28 (3.73)
(7) Sequential pretense	0.36 (0.76)	0.20 (0.50)	0.36 (0.86)
(8) Substitution pretense	–	–	–

indicated that children with ASD showed more exploratory play than TD children and children with DS (**Table 3**). No main effect of group emerged for symbolic play. Follow-up ANOVAs on the eight individual play levels did not yield any significant result after Bonferroni *p*-value adjustment. However, a tendency of children with ASD to display more Unitary Functional Activity than children in the control groups emerged; specifically, we found an effect of group on Unitary Functional Activity at a standard level of significance, $F(2,72) = 3.3$; $p < 0.05$), and Tukey HSD *post hoc* indicated that children with ASD performed more Unitary Functional Activity than both groups of control peers.

Maternal Play and Solicitation

Results showed a statistical difference among mothers for exploratory play, $F(2,72) = 3$; $p < 0.05$. Tukey HSD *post hoc* indicated that mothers of children with ASD showed more exploratory play than mothers of TD children and children with DS (**Table 4**). No significant differences between groups were found for maternal symbolic demonstration of the play.

ANOVAs yielded a significant group main effect for mother solicitation. Results showed that mothers of children with ASD

used less symbolic solicitation than mothers of children with TD (**Table 5**). No significant differences between the three groups of mothers emerged in exploratory solicitation.

Mother Solicitation/Demonstration and Child Play

Pearson correlation analyses showed strong positive associations between mother play and child play for all of the groups of children. More specifically, we found a high positive correlation between mother play and child play for exploratory play (TD: $r = 0.43$ $p < 0.01$; DS: $r = 0.66$ $p < 0.01$; ASD: $r = 0.69$ $p < 0.01$) and for symbolic play (TD: $r = 0.37$ $p < 0.01$; DS: $r = 0.39$ $p < 0.01$; ASD: $r = 0.40$ $p < 0.01$). Regarding the verbal solicitation a significant positive association emerged with exploratory index in normal developing children only ($r = 0.21$, $p < 0.05$) and with symbolic index in children with ASD only ($r = 0.36$ $p < 0.01$). No statistically significant associations were found between maternal solicitation and child play in children with DS.

DISCUSSION

Play is universally a crucial activity for the development of children. Through play, the child explores the physical characteristics of the objects and develops his/her cognitive skills (Bornstein and O'Reilly, 1993). Empirical studies of child objects and representational play have defined a normative trajectory of development: play activities of greater sophistication are gradually achieved in accordance with a normative developmental path that proceeds from exploration of objects to pretense with them (Belsky and Most, 1981; Tamis-LeMonda and Bornstein, 1996; Bornstein et al., 2002). To reach higher levels of sophistication, in addition to child developing cognitive abilities, the participation of a mature partner' in play is fundamental. The purpose of the present study was to investigate several features of play in children with ASD compared to a group of mental age-matched TD children and children with DS during mother–child interaction. Specifically, we aimed to compare the three groups of dyads in terms of the structure of child play, quantity and quality of maternal play, and the associations between mother solicitation and child play.

Considering our first aim, we found that children with ASD were more engaged in exploratory activity compared to children with DS and children with TD. This result is in accordance with a previous study of Dominguez et al. (2006) showing that children with ASD engaged in more exploratory play than children with typical development. In particular, our results showed a tendency in children with ASD to spend more time in a "unitary functional activity," that is the simplest exploratory play level, than the control groups. In other words, children with ASD engaged longer in simple activities including one object at the time, such as pushing the train or throwing a ball, compared to their peers. Unitary functional play activity requires a simple understanding of the objects' properties and is less dependent from learning by an adult as a model; therefore, it can be suggested that this kind of play is easier for children with social impairments such

as ASD (Thiemann-Bourque et al., 2011). On the other hand, this result can be explained with the tendency of children with ASD to engage with toys in repetitive ways, accordingly to the repetitive and stereotypical behaviors that characterize these disorders (Jarrold et al., 1993). Another possible explanation may rely on the sensory stimulation that these children get from some of these play activities (e.g., pushing the train); previous researches indicate that children with disabilities show preferences for toys that produce sensory feedback when used by a child. These preferences may be related to the ability of the toy to provide the child with structure through an external stimulus (Malone and Langone, 1994).

With respect to our second aim, we did not find any difference among the three groups of children concerning symbolic play. In our study children with ASD showed the same capacity for symbolic play of developmentally matched children with DS and TD children. This result is in contrast with traditional studies that showed abnormalities in symbolic play in children with ASD (Jarrold et al., 1993; Williams et al., 2001) and with the clinical evidence of affected symbolic play in children with ASD. As an example, Jarrold et al. (1996) in an experimental setting found that children with ASD aged 4–12 years produced less pretend play and, even when prompted, they produced pretend actions at a lower rate, compared to children with learning difficulties. The latter study differs from the current study for the older age range of the participants and for the structured setting. Mundy et al. (1986), who considered participants of about 24 months of mental age – similarly to or study – and tested free and structured play conditions, also reported abnormal symbolic play in children with ASD compared to mental age-matched children with intellectual disability, but the difference between groups was evident for structured symbolic acts only. On the other hand, our results accords with some more recent studies that have also indicated that children with ASD show the same pretend play abilities as typically developing children and children with other disorders matched on age and/or IQ (Warreyn et al., 2005; Dominguez et al., 2006). We believe that two main aspects contributed to the explanation of our findings: the developmental age of the children in our sample and the collaborative play situation we analyzed. First of all, the capacity for symbolization increases after 24 months of mental age; for this reason, the difficulties in symbolic play of children with ASD may become more evident at a developmental age of 2 years or more, whereas children in our sample had a developmental age of 21 months. Consistently, our code for the evaluation of symbolic play included also very simple acts of pretense directed to the self or to the others (drinking from a cup or make the mother drink from a cup) that could happen one at the time or chained into a sequence; object substitution, the highest level of symbolic activity had a very low frequency. In many other studies, instead, only imaginative and more spontaneous activity are considered. Also, qualitative indicators of fun and enjoyment were not accounted in our study. By the way, children with ASD in our study have a higher chronological age than typically developing children, therefore these children do present a limited capacity for symbolic play compared to their peers but we cannot ascribe it to a specific deficit that goes beyond

the intellectual delay (Naber et al., 2008). The simplest levels of symbolic play seems to be achieved by children with ASD of our sample, consistently with studies demonstrating that symbolic and pretend play can develop in children with ASD at a slower pace, but for many of them pretend play stays qualitatively different from that of their typically developing peers, lacking qualitative indicators of fun and enjoyment (Riquet et al., 1981; Lewis and Boucher, 1995; Jarrold et al., 1996; Charman and Baron-Cohen, 1997; Rutherford et al., 2006; Kasari et al., 2013). This result can be also connected with some literature which found that when children with ASD receive prompts to perform, they engage in the same level of pretend play as typically developing children at the same developmental level (Lewis and Boucher, 1995; Charman and Baron-Cohen, 1997; Lewis et al., 2000). It can be hypothesized that in this early stage of symbolic play emergence, the presence of an attuned and supportive partner allowed the children the perform at the higher level of they capabilities within the Zone of Proximal Development (Vygotsky, 1978). Indeed, in our study, no associations of chronological and mental age with child play level emerged within the three samples of participants. Other factors, related to the interactive play setting we analyzed, might better account for the individual differences in children's play, as described below.

Concerning the third aim, our expectations about mother play was confirmed: mothers adapted well their play activities to their child's play sophistication level. In fact, mothers in all groups showed more exploratory play than symbolic play, as their children did. Moreover, just like their children, mothers of children with ASD presented more exploratory play but the same amount of symbolic play than mothers in the control groups. Thus, all mothers preferred to reinforce the kind of play behaviors in which their children showed better abilities, i.e., exploratory play. However, considering maternal stimulation through verbal solicitation, we found that mothers of children with ASD used fewer symbolic solicitations than mothers of children with TD, indicating that they didn't encourage them to higher level of play, as mothers of typically developing children did. One possible explanation is that mothers of children with ASD already expected difficulties in the symbolic domain either for having experienced them at a different level or because they know they are diagnostic features of ASD. In contrast to the previous studies (Lemanek et al., 1993; Doussard-Roosevelt et al., 2003) our results did not show a greater verbal solicitation of mothers of children with ASD or DS.

Regarding the associations between maternal solicitation and child play, we found high correlations between mother and child play in all groups. These similarities, again, speaks for the ability of all mothers to appropriately adapt their play activity to child developmental level, independent from the child diagnostic condition (Kasari et al., 1988). Moreover, we found a strong positive correlation between maternal verbal solicitation of symbolic play and children actual symbolic play for mothers of children with ASD only. This result suggests that, like all mothers, mothers of children with ASD play a crucial role in their psychological development, but they might contribute even more to determine their actual achievements reducing the effect of the potential limitations imposed by their pervasive deficits (Flippin and Watson, 2011).

Future research is needed to examine more deeply the types of behaviors mothers use to match or scaffold their child's play. Several limitations of this study should be mentioned. First, having larger samples would allow a greater generalization of the data. Second in our study we used an observation at single point, so longitudinal studies are needed to follow the development of these children's play across time. Future work should also consider associations between parents' positive affect and sensitivity and the level of specific abilities child's play (Bornstein et al., 2002; Venuti et al., 2008; de Falco et al., 2010). However, this study has some important clinical implications. First of all, in a natural interactive setting, symbolic play of children with ASD was similar to that of developmentally matched children with DS and of TD children. It appears that simple levels of symbolic play skills are preserved in children with ASD with a developmental age of about 2 years and can be observed during a natural play interaction with a significant partner. Developmental age and context of testing condition appear therefore to be crucial variables for the comprehension of play skills development in children with ASD. Moreover, mothers of children with ASD were able to adapt to their children's play level and to efficiently prompt appropriate play behaviors through language. These results speak in favor of early interventions for ASD that involve parent-child dyads and promote the development of social and cognitive skills within play interactions.

AUTHOR CONTRIBUTIONS

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

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Predictors and Moderators of Spontaneous Pretend Play in Children with and without Autism Spectrum Disorder

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Although pretend play has long been linked to children's normative cognitive development, inconsistent findings call for greater rigor in examining this relation (Lillard et al., 2013). Spontaneous pretend play is often impacted in atypical development, notably in autism spectrum disorder (ASD). Since ASD traits exist along a continuum in the general population, investigating how pretend play varies across the range of ASD symptoms by indexing variations in ASD traits in both typically developing and ASD populations may provide insight into how ASD symptoms may influence the relation between pretend play and associated processes in cognitive development. This study used rigorous observational methods to assess spontaneous pretend play. Specifically, 5-min free-play sessions with two discrete toy sets were double-coded by blinded coders (coder assignment counterbalanced). Key facets of pretense development [attribution of pretend properties (APP), object substitution (OS), imaginary objects] were examined. These facets of pretend play production were then analyzed in relation to ASD symptoms, as well as plausible, long-theorized correlates [theory of mind (ToM), verbal ability, familiarity, and interest in specific toys]. Forty children ($M_{age} = 6;5$, $SD_{age} = 1.45$; 29 males), six of whom met the threshold for ASD diagnosis via parent-reported ASD symptoms, participated in play sessions and completed measures of verbal IQ and ToM. Besides the measure of child ASD symptoms, parents completed a survey of their child's interest in and familiarity with the play session toys. Overall, greater ToM predicted more APP, and more interest in the toys presented predicted more OS. In terms of overall pretend play production, two results were counterintuitive. First, among children with more ASD symptoms, verbal ability marginally negatively predicted pretend play production. Second, among children with fewer ASD symptoms, ToM negatively predicted pretend play production. Further probing revealed that the negative effect of ASD symptoms on pretend play was simultaneously moderated by both variables: low ToM and high verbal ability both related to less pretend play production among children with more ASD symptoms. Implications for assessment and subsequent treatment for pretend ability among children with varying degrees of ASD symptoms, as well as for future research, are discussed.

Keywords: autism spectrum disorder, spontaneous pretend play, assessment, cognitive development, observational coding

INTRODUCTION

Play is a common feature of childhood. While exploring the world around them, children begin to play with everyday objects (e.g., pots and pans), more typical objects (e.g., dolls and toy cars), and eventually with their peers. By the time they are 3 years old, most typically developing (TD) children independently and spontaneously engage in symbolic or pretend play, such as pretending a banana is a telephone (Lillard, 2015). Pretend play is a combination of play and pretense, or the "stretching (of) one reality over another" (Lillard, 1993). The ability to pretend requires a metarepresentational ability, or the ability to hold onto two mental representations in the mind (Leslie, 1987; Lillard, 1993). The first reflects the state of the real world, or the perceived situation (e.g., here is a cup, the cup is empty), and the second reflects the pretend situation (e.g., this cup that is really empty contains tea; Leslie, 1987) that the pretender needs to be able to map onto the contexts of the real world.

Although, increasingly sophisticated pretend naturally emerges in TD children in their second year of life (Haight and Miller, 1993), the development of pretend appears impaired for autism spectrum disorder (ASD) children, even for those who are "high-functioning" with intact verbal ability (Jarrold, 2003). Even though children with ASD might pretend less and differently, research consistently suggests that many children with ASD *do* still pretend (Baron-Cohen, 1987; Libby et al., 1998; Rutherford and Rogers, 2003). According to Jarrold (2003), individuals with ASD may have an underlying capacity to *understand* pretend, but fail to *engage in spontaneous* pretend. Several studies showing individuals with ASD as on par with controls at predicting the result of pretend sequences support the proposition of intact pretense comprehension in the ASD population (Jarrold et al., 1994; Kavanaugh and Harris, 1994).

In order to understand how pretend play varies across the range of ASD symptoms, it is useful to index variations in ASD traits in both TD and ASD populations (Russell-Smith et al., 2012), as ASD traits exist along a continuum in the general population (Constantino and Todd, 2003; Best et al., 2008). However, to date, little research has examined whether differences in pretend play production vary as a function of ASD symptoms dimensionally across TD and ASD populations. The sole exception is a recent study by Campbell et al. (2016), which found a negative correlation between ASD symptom severity and pretend play in toddlers. Moreover, little work has carefully explored the factors that contribute to spontaneous pretend among children with varying levels of ASD symptoms, the consideration of which will help better illuminate the factors that contribute to the development of the ability to pretend in children.

In addition to assessing how ASD symptoms might contribute to the ability to produce pretend, it is important to examine how various factors might directly influence different subtypes of pretend. Actions of pretend play often fall under one of three categories (Leslie, 1987): object substitution (OS; e.g., pretending a block is a car), attribution of pretend properties (APP; e.g., pretending dishes are dirty), and imaginary objects (IO; e.g., pretending to read a book when there is no book present). A small body of research suggests that it is not pretend as a whole, but certain types of pretend that are more challenging for individuals with ASD. For instance, Libby et al. (1998) demonstrated that children with ASD produced just as much OS as TD children, but produced significantly fewer acts of APP and IO, resulting in fewer acts of overall pretend compared to TD children. It is plausible that each of these categories of pretend may require slightly different child capacities and experiences (e.g., knowledge and understanding that a doll represents a human might lead a child to attribute the pretend property of talking, whereas knowledge and understanding that a doll is a vertical object that you can bang against things might lead a child to engage in OS and substitute the doll for a hammer), and may therefore represent categorically different styles of pretend play. Thus, assessing how certain predictors might influence pretend ability as a whole, as well as subtypes of pretend, may provide deeper insight into which elements of pretend (and associated mental representations) might contribute to difficulties with pretend among individuals with ASD. Moreover, researchers have not yet explored whether differences of pretend play subtypes produced would be evident among TD individuals with varying levels of ASD symptoms.

Associations between pretend play, ToM, and verbal ability are frequently found (Astington and Jenkins, 1995, 1999; Jenkins and Astington, 1996, 2000; Taylor and Carlson, 1997; Lewis et al., 2000; Bigham, 2010). Crucially, however, current research does not strongly support causal relations between engaging in pretend actions and the development of perspective-taking [theory of mind (ToM); Dore et al., 2015] and other developmental domains in TD children, calling for a greater rigor in clarifying relations of pretend play and these domains (Lillard et al., 2013). Therefore, carefully examining such links are helpful in understanding how pretend play normally develops, and how children with ASD symptoms might pretend differently.

ToM is the ability to understand others' mental states and how other individuals might perceive the world (Leslie, 1987; Baron-Cohen, 1995; Wellman, 2014). Taylor and Carlson (1997) found a link between ToM ability and individual differences in pretend among TD children, suggesting that TD children with greater ToM ability may be able to produce more actions of pretend. These findings have since been supported longitudinally (Jenkins and Astington, 2000). That is, the ability to understand others' perspectives may facilitate a greater ability to understand and produce pretend play. More recent evidence suggest that a third variable underpinning both ToM and pretend play, such as a more general symbolic capacity, may account for the link between ToM and pretend play (Lillard and Kavanaugh, 2014).

However, many individuals with ASD have difficulty understanding and interpreting others' mental states (Baron-Cohen, 1995, 2001). Concurrently, while some children with ASD understand others' actions of pretend, they still struggle to produce pretend (Jarrold, 2003). One explanation for these impaired abilities (ToM and pretend) among individuals with ASD might reflect difficulty in a symbolic substrate that underlies both pretend play and ToM development (e.g., Lillard and Kavanaugh, 2014).

Although, research supports a link between production of pretend and ToM ability (Taylor and Carlson, 1997) among TD children, this might represent a pathway typically used by TD individuals, and less often used by individuals with ASD. This might be because ToM appears not to develop organically among individuals with ASD. Instead, individuals with ASD may deliberately engage in a "hacked together" ToM, rather than intuitively engaging in a more "automatic" ToM (Dissanayake and Macintosh, 2003). The hacking hypothesis explains how individuals with high functioning ASD may pass ToM tasks via this less efficient, more deliberate route. Furthermore, those with ASD may engage in a "hacked together" ToM by learning specific rules that allow them to pass ToM tasks, rather than using social understanding and an understanding of other's perspectives (Dissanayake and Macintosh, 2003). Given that intuitive, "automatic" ToM might not develop naturally among those with ASD, it is plausible that the presence of ASD symptoms may weaken the relation between ToM and pretend production.

On the other hand, pretend comprehension does appear to be related to ToM when considered among a large group of children including those with ASD, TD children, and children with intellectual disabilities (IDs; Bigham, 2010). However, pretense comprehension bears no relation to pretend production in TD children (Lillard and Kavanaugh, 2014). While Bigham's (2010) findings suggest that ToM ability is linked to *understanding* pretend among individuals with ASD, no research has explored whether this link also exists when looking at the *production* of spontaneous pretend among this population. Additionally, no one has directly tested whether there would be a weaker relation between ToM ability and pretend play among individuals with more ASD symptoms compared to those with fewer symptoms. Furthermore, little research has explored differences in subtypes of pretend in relation to ToM ability.

A second suggested link with pretend play among TD children is with verbal ability (Lewis et al., 2000; Rutherford and Rogers, 2003; Bigham, 2010). Lewis et al. (2000) looked at the relation between language and pretend ability among verbal and non-verbal TD participants and assessed OS, APP, and IO. Lewis et al.'s (2000) findings indicated a relation between pretend play and language development. In addition, longitudinal studies have suggested that play and language may be developmentally related (e.g., Ungerer and Sigman, 1984; McCune, 1995; Lillard and Kavanaugh, 2014).

On the other hand, although verbal mental age seems to be correlated with pretend play production for both TD and children with other developmental disabilities (DDs) than ASD, such relation is not found in children with ASD (Rutherford and Rogers, 2003). This suggests that the link between verbal ability and pretend might be a pathway typically used by TD individuals and individuals with other DD, but one that individuals with ASD are less able to access. Individuals with ASD might be less able to access this pathway due to developmental deficits in communication, a diagnostic feature required for having an ASD (*DSM-5*, 2013). Similarly, those with more ASD symptoms might also experience some deficits in communication that make this pathway between verbal ability and pretend less accessible. Furthermore, given Rutherford and Rogers's (2003) findings,

one might predict that the relation between verbal ability and pretend would be weaker among TD children with greater levels of ASD symptoms; however, this has not been directly tested. Additionally, little research has explored differences in subtypes of pretend in relation to verbal ability.

If children with ASD are less able to use more typical pathways to pretend, like ToM and verbal ability, it is possible that individuals with ASD that are able to pretend use alternate pathways. Different factors may predict patterns of pretend in youth with ASD relative to TD and reflect the divergent developmental pathways used by children with ASD and TD children to arrive at the ability to produce actions of pretend. Two plausible factors are interest in and experience (familiarity) with specific toys. Although research studies have measured familiarity and interest to control for these factors when evaluating the effectiveness of pretend play interventions for youth with ASD (Murdock and Hobbs, 2010), little research has examined them as predictors of pretend play.

A child's interest in an object can be characterized by repeated voluntary engagement with that object, with no outside encouragement (Hidi et al., 2004; DeLoache et al., 2007). As children explore different ways that they can interact with and play with those toys due to personal interest, pretend is one type of play that might result from repeatedly engaging with toys. Research has demonstrated that interest appears to drive and motivate the behaviors in which TD individuals choose to engage and the objects with which they chose to play (Hidi et al., 2004). However, these motivational aspects might play a minimal role in driving the pretend behavior of TD children, given pretending's robust and seemingly spontaneous emergence in most TD children by the age of three (Lillard, 1993).

Presence of restricted, repetitive patterns of behavior, interests, or activities is a core feature of ASD (American Psychiatric Association [APA], 2013). Given that specialized interests (e.g., in toys or topics) are more common among ASD individuals (Baker et al., 1998; Vismara and Lyons, 2007), interest and motivation may play an especially crucial role in the play behaviors of youth with ASD (Koegel and Mentis, 1985). Even though children with ASD have been shown to engage in fewer actions of pretend and different subtypes of pretend (Libby et al., 1998), interest in objects might play an important role in initiating the actions of spontaneous pretend that these children can and do produce by motivating a child with ASD to repeatedly engage in actions of play with that toy. Due to a personal interest in a specific toy, children with ASD may have played with that toy frequently and already have an understanding of the typical functions of the toy. Hence, they might be more readily able to try out novel uses with it, such as pretend play. Such experiences may, in turn, facilitate basic metarepresentational capacities in a child with ASD.

Furthermore, familiarity with an object might also facilitate a child with ASD to produce actions of pretend. A child's level of familiarity with an object is based on how often that child has seen or been exposed to that object (Hidi et al., 2004). The more children (either TD or ASD) are exposed to a certain object, the better they apperceive the characteristics of that object. Perhaps it is easier for a child with ASD to go beyond the percept to attribute abstract (pretend) characteristics to an object once they become

more familiar with it. Conversely, as some youth with ASD tend to engage in repetitive behavioral routines with familiar objects (Leekam et al., 2011), they may in fact be more likely to engage in novel play routines (e.g., pretend) with less familiar objects. In this sense, familiarity could be seen to relate to more *or* less pretend in this population; crucially, though, it could plausibly be *more* related to pretend production in ASD relative to TD children.

Despite the proposed relation of interest in and familiarity with objects to spontaneous pretend play, and the theorized differences in this relation between TD and ASD youth, no previous research has explored this connection directly. Furthermore, no research has explored differences in subtypes of pretend in relation to interest in and familiarity with toys.

Using rigorous observational methods to assess spontaneous pretend play, the current study examined the relation between overall quantity and well-established subtypes of pretend play (OS, APP, and IO) spontaneously produced by TD and ASD children and measures of ASD symptoms, verbal ability, ToM, and interest in and familiar with presented toys. We hypothesized that (1) children reported to have more ASD symptoms would engage in less spontaneous pretend play overall, fewer acts of APP and IO, and comparable levels of OS relative to those with fewer ASD symptoms (Libby et al., 1998). Second, we hypothesized that (2a) both well-established (verbal ability and ToM) and novel (interest and familiarity) predictors of pretend would relate positively to overall pretend play. We also considered sub-hypotheses regarding the relation between ToM, verbal ability, and interest and familiarity, and subtypes of pretend. Given Libby et al.'s (1998) finding that individuals with ASD produced fewer acts of APP and IO, and the conjecture that certain pathways to pretend might be less (ToM and verbal ability) or more (interest and familiarity) accessible to individuals with more ASD symptoms, we hypothesized that (2b) better ToM and verbal ability would relate to more instances of APP and IO and that more interest in and familiarity with the presented toys would relate to more instances of OS. Furthermore, we hypothesized that (3a) ToM and verbal ability would show stronger relations to pretend quantity among individuals with fewer reported ASD symptoms compared to those with more symptoms. In a sub-hypothesis, we hypothesized that (3b) better ToM and verbal ability would result in more instances of APP and IO for those with fewer ASD symptoms. Finally, we hypothesized that (4a) levels of familiarity and interest in presented toys would show stronger relations to pretend quantity among individuals reported to have more ASD symptoms compared to those with fewer symptoms. In a sub-hypothesis, we hypothesized that (4b) more interest in and familiarity with the presented toys would result in more instances of OS for those with more symptoms of ASD compared to those with fewer symptoms.

MATERIALS AND METHODS

Participants

Participants were thirty-four TD children (M_{age} = 6;1, SD_{age} = 2.0; 23 males) and six with ASD (M_{age} = 5;2, SD_{age} = 1.0;

six males). Participants were recruited using the University of Virginia Babypool database, which is comprised of names and numbers of local Charlottesville families willing to be contacted to participate in research (see **Table 1** for demographic information). This study was carried out in accordance with the recommendations of University of Virginia Institutional Review Board for the Social and Behavioral Sciences, with written informed consent from parents of all subjects.

Procedure

Each participant completed two visits. During their first visit, participants completed a measure of cognitive ability, including verbal ability (the Kaufman Brief Intelligence Test 2; KBIT-2; Kaufman and Kaufman, 2004). Parents completed a measure of ASD symptoms throughout their child's development [Social Communication Questionnaire (SCQ); Rutter et al., 2005], a standard developmental history form, and a questionnaire regarding their child's experience with and interest in specific toys.

At the beginning of the second visit (usually completed by the same research assistant as visit 1), ToM measure(s) were administered, followed by two 5-min free-play sessions with toys. One play session involved a set of six conventional objects (toy car, female doll, male doll, pan, spoon, and bowl) and the other involved a set of six "junk" objects (piece of string, piece of cardboard, butter tub, margarine tub, empty spool, and empty matchbox), consistent with the work of Libby et al.'s (1998) study. Both conventional and junk objects were used given that "high structured" conventional objects have been shown to elicit more pretend play than "low structured" junk objects (McLoyd, 1983). Having both toy sets allowed for gathering more data regarding how children pretend with different toys, and allowed for estimation of each child's "average" spontaneous pretending across situations that may tend to elicit more or less pretense. The order in which object sets were presented was randomized.

TABLE 1 | Participant descriptive statistics (N = 40).

Variable	Mean (SD)	Range
Age	5.98 (1.46)	4.00–8.92
Sex	29 male	
Overall IQ	116.58 (15.46)	58–141
Social Communication Questionnaire	6.38 (7.12)	0–26
Verbal IQ	113.68 (15.17)	86–138
ToM	6.50 (3.56)	0–13
Familiarity	3.79 (0.57)	2.67–4.83
Interest	2.68 (0.66)	1.75–4.33
No Play	6.91 (4.13)	0.25–15.75
Non-Symbolic Play	8.93 (3.32)	3.25–16.25
Pretend Play	4.11 (3.45)	0–12.25
Pretend Play – Object Substitution	0.84 (1.22)	0–6.75
Pretend Play – Attribution of Pretend Properties	2.10 (3.05)	0–11.75
Pretend Play – Imaginary Objects	1.24 (2.41)	0–10.25

ToM = Combined Theory of Mind score (Theory of Mind Scale plus Strange Stories).

When introducing a toy set, the six objects were arranged in a semicircle around the child, ensuring that each toy had an equal opportunity of being selected (Servin et al., 1999). While placing the toys, the research assistant recited the following script (similar to McLoyd, 1983; Baron-Cohen, 1987): "I have some work to finish up. I will be back in a few minutes. Here, are some toys for you to play with while I'm working. You can do anything you like with them." After 5 min of free-play with the first set of objects, the next set was introduced in the same manner, and the procedure repeated. All play sessions were videotaped to allow for independent blinded subsequent coding of play content by separate raters.

Measures

SCQ (Rutter et al., 2005)

This parent-report questionnaire is a widely used screener for ASD. This measure examines the presence or absence of specific ASD symptoms across a child's development thus far, and was used to compare ASD symptom levels across participants. The subscales of the SCQ are reciprocal interactions (example item: Does your child have any particular friends or a best friend?), communication (example item: Did your child ever spontaneously point at things around him/her just to show you things [not because she/he wanted them]?), and restrictive repetitive behaviors (example item: Did your child seem unusually interested in the sight, feel, sound, taste, or smell of things or people?; Rutter et al., 2005). These subscales represent the three core deficits among individuals with ASD. SCQ scores can range from 0 to 40 and scores above the threshold of 15 suggest a high likelihood of meeting criteria for ASD.

Theory of Mind Scale (ToM Scale; Wellman and Liu, 2004)

This ToM Scale was used, because it is a standardized instrument designed to measure ToM development among TD individuals up through the mental age of 5 (Peterson et al., 2005). To maximize the sensitivity of these scales to diverse forms of ToM we used the original six-items version. The scale is comprised of six tasks, with each task increasing in level of difficulty. The tasks are: diverse desires, diverse beliefs, knowledge access, contents false belief, explicit false belief, and real-apparent emotion (Wellman and Liu, 2004). All six tasks were administered due to the finding that no task alone can account for the progressive development of ToM capabilities (Wellman and Liu, 2004). Participants were awarded zero points for incorrect answers and one point for correct. Total points awarded could range from 0 to 6.

Strange Stories (Happé, 1994)

This advanced ToM battery is able to effectively measure ToM capabilities among TD individuals ranging in age from 5 to 12 years old (O'Hare et al., 2009). There were 10 stories, nine of which were measures of ToM ability, and one was a control story that only asked questions regarding physical events to ensure that there was no comprehension deficit. The stories were either read aloud to the participant by the experimenter or the child read the story aloud. Administration of Strange Stories allowed for a deeper examination of a child's ToM development by looking at whether or not the child was able to provide mental state explanations for why a story's character might have acted a certain way (Happé, 1994). In order to test for higher levels of ToM, Strange Stories was administered to any participant that passed all six of the tasks presented in the Wellman and Liu (2004) ToM scale. Participants received a score of 1 (successfully provided the correct mental state explanation for a character's behavior) or 0 (failed to provide correct mental state explanation) for each story, yielding overall scores ranging from 0 to 9 on this measure. Scores on the ToM Scale and Strange Stories were summed to create a composite ToM score for youth across the given age range, ranging from 0 to 15.

KBIT-2 (Kaufman and Kaufman, 2004)

The KBIT-2 is a measure of verbal IQ, non-verbal IQ, and Full Scale IQ scores. It produces standard scores ($M = 100$, $SD = 15$). The verbal IQ score was used to assess participant's verbal ability and ensure that each participant was of normally developed intelligence (IQ > 85) and verbal ability (verbal IQ > 85). The benefit of using the KBIT-2 is that it is faster to administer than the more common Wechsler intelligence scales, while still measuring both verbal and non-verbal cognitive functions and providing a composite IQ score (Naugle et al., 1993). Furthermore, research findings (Naugle et al., 1993) indicate that scores from the KBIT are comparable to the Wechsler scales in this age range, and construct validity was supported.

Toy Survey

Parents completed a survey in which they indicated their child's interest in and familiarity with each of the toys presented during the play sessions. Parents rated interest and familiarity for all of the toys on a 1 (not at all) to 5 (extremely) scale. This resulted in 12 ratings of familiarity and 12 ratings of interest (given the six junk and six conventional toys). These ratings were averaged in order to get an overall measure and gross approximation of each participant's familiarity and interest with these sets of toys.

Pretend Play Coding Scheme

The pretend play coding scheme was designed to code for different types of play (No Play, Non-Symbolic Play, Pretend Play) and, if pretending, subtype (OS, APP, IO; Libby et al., 1998). No Play meant that a child was engaging in various types of behavior, but that he or she was not playing (e.g., not attending to objects, labeling objects, and looking at objects without acting on them). Any type of play that could not be categorized as one of the three types of pretend was coded as Non-Symbolic Play (e.g., piling and stacking objects, spinning objects, tossing objects, and banging objects). OS was defined as clearly using an object as if it was another *specific* item (e.g., using the doll as a spoon, using the car as a piece of food). APP was defined as indicating the presence of features (i.e., color, size, abilities to talk) to an object that deviated from the true features an object actually had. These features could represent actual characteristics the object *could* have or *imaginary* characteristics (e.g., walking the female or male, and claiming the toy pan was hot). IO was defined as acting as if an actual item that was *not* present in the room was

in fact present. IO required the behavior to involve the presented toys (i.e., could not involve talking to an imaginary friend), and be explicit such that the coder could clearly identify each absent object (e.g., eating imaginary food, stirring "something" in pan or bowl). These definitions were chosen to maximize clarity that target behaviors were observed, yielding conservative estimates of each play type.

Pairs of coders, blind to each other's scores as well as the scores of the observed child on other measures, watched 5-min play sessions and coded the play in 15-s intervals, similar to the procedure of Libby et al. (1998). The coding team consisted of three undergraduate students naïve to study hypotheses. Over a 2-month period, the team was trained by reading the pretend play coding manual, attending weekly meetings, practicing coding using training tapes, and reviewing and discussing specific training intervals. ICCs were calculated to assess reliability according to standards specified by Cicchetti (1994). Coders were "certified" for coding once their ratings, as a group, achieved acceptable scale level interrater reliability [ICC(2,4) > 0.60] relative to master codes on 20 separate practice tapes of child interactions with a variety of toys. Once coding began, reliability assessments were performed and discussed at weekly meetings to minimize coder drift (Margolin et al., 1998).

All sessions were observed and double-coded for play type (no play, non-symbolic play, pretend play) and, if pretending, subtype (OS, APP, IO; Libby et al., 1998), yielding 62 pairs of ratings. For each 15-s interval, play was coded for the highest level of play in which participants engaged (From lowest to highest; No Play, Non-Symbolic Play, Pretend Play). If Pretend Play was selected, the subtype of pretend was also coded. Subtype of pretend was based on which type of pretend best characterized the interval. Each participant could have engaged in any type of play, or subtype of pretend, yielding scores of 0 to 20 for each play type and subtype, given the 15-s intervals and the 5-min play session. We averaged across the two 5-min play sessions (conventional and junk) in order to obtain a sample of spontaneous pretend from situations shown to elicit lesser and greater quantities and qualities of pretend (McLoyd, 1983). This was then used to determine each child's "average" ability to produce actions of pretend. Interrater reliability ICC(1,2) was excellent for No Play (0.85), Non-Symbolic Play (0.83), Pretend Play (0.90), APP (0.89), and IO (0.97), and was good for OS (0.63) (Cicchetti, 1994).

Data Analytic Plan

We first used descriptive analyses to assess amount of play types and pretend play subtypes produced (No Play, Non-Symbolic Play, Pretend Play, OS, APP, and IO), number of ASD symptoms, verbal ability, ToM ability, and interest in and familiarity with the toys. We then used bivariate correlations to explore relations between continuous variables. To test hypothesis 1, that children with more ASD symptoms would engage in less spontaneous pretend overall, fewer acts of APP and IO, and more acts of OS relative to lower scoring participants, we examined the correlations

between play types and pretend subtypes compared to SCQ scores.

To test hypothesis 2, that both well-established (verbal and ToM abilities) and novel (interest and familiarity) factors would relate positively to amount of overall pretend play, we looked at the correlations between each factor and overall pretend. To examine the sub-hypothesis that better ToM and verbal ability would result in more instances of APP and IO and that more interest in and familiarity with presented toys would result in more instances of OS, we examined correlations between these predictors and the respective pretend subtypes.

Our third hypothesis was that ToM and verbal ability would show stronger relations to overall pretend among individuals with fewer ASD symptoms compared to those with more symptoms. The sub-hypothesis was that better ToM and verbal ability would predict more instances of APP and IO for those with fewer ASD symptoms compared to those with more symptoms. To test these hypotheses, we ran hierarchical multiple regressions predicting overall pretend, APP, and IO, with age and ASD status on step 1, predictors (SCQ scores, ToM, verbal ability) on step 2, and the interactions between SCQ scores and age, ToM, and verbal ability on step 3. Interactions were investigated with *post hoc* probing (Holmbeck, 2002).

Our fourth hypothesis was that levels of interest in and familiarity with presented toys would show stronger relations to overall pretend among individuals with more ASD symptoms compared to those with fewer symptoms. The sub-hypothesis was that more interest in and familiarity with the presented toys would result in more instances of OS for those participants with more symptoms of ASD compared to those with fewer symptoms. To test these hypotheses, we used the same overall pretend regression model as for the third hypothesis (and ran an identical model predicting OS), except we examined interactions between interest, familiarity, and SCQ scores. Interactions were again probed. For hypotheses 1, 3, and 4, significant effects were probed by re-running analyses with the SCQ score replacing each of its 3 subscales to determine which, if any, were driving the effect.

RESULTS

Descriptives

Table 1 presents descriptive statistics. Participants displayed normal intelligence and verbal ability, and a wide range of interest in and familiarity with the toys. Participants also displayed developmentally-appropriate ToM ability. Participants ranged from having a history of 0 ASD symptoms to 26 ASD symptoms; 15 symptoms is the screening cutoff for ASD. Play scores indicate that participants' play was characterized by No Play about a third of the time, Non-Symbolic Play about half the time, and Pretend Play about a fifth of the time. However, most participants (±1 *SD*) engaged in 0–7 instances of Pretend Play. In terms of subtypes of pretend, APP was the most common and although OS was rare, it still made up roughly a quarter of the observed instances of Pretend Play.

Bivariate Correlations

Table 2 presents correlations between continuous variables. Older participants had better ToM, fewer instances of No Play, and more instances of Non-Symbolic Play and APP. Older participants also displayed more familiarity with the toys.

Participants with higher overall IQ and verbal IQ had less ASD symptoms and better ToM. Participants with higher verbal IQ (only) had more Non-Symbolic Play.

More ASD symptoms predicted less ToM, less familiarity with the toys, more No Play, and less Non-Symbolic Play. Among all participants, better ToM predicted less No Play and more Non-Symbolic Play. Finally, more interest in the toys predicted more OS. Subtypes of pretend play were *not* significantly correlated with each other.

Hypothesis 1 – ASD Symptoms and Pretend

No significant correlations were found between SCQ scores and the amount of overall pretend produced or subtypes of pretend produced (**Table 2**).

Hypothesis 2 – ToM, Verbal Ability, and Interest and Familiarity and Pretend

Theory of mind, verbal ability, and interest and familiarity were not shown to be predictors of overall pretend. However, better ToM predicted more APP to the toys and more interest in the toys predicted more OS with the toys. Familiarity and verbal ability were not shown to be predictors of any pretend play subtypes (**Table 2**).

Hypothesis 3 – ToM, Verbal ability, ASD Symptoms and Pretend

Significant interactions were found between ASD symptoms and VIQ ($B = -0.014$, $p = 0.034$), and ASD symptoms and ToM ($B = 0.18$, $p = 0.004$) in predicting overall pretend play (**Table 3**). An interaction was found between ASD symptoms and ToM ($B = 0.10$, $p = 0.021$) in predicting IO (**Table 4**). Probing indicated a negative relation between ToM and pretend play among those with low SCQ ($B = -1.74$, $p < 0.05$; **Figure 1**) and a marginally negative relation between VIQ and pretend play among those with high SCQ ($B = -0.13$, $p < 0.10$). Effects were consistent across subdomains of the SCQ, and were reduced when excluding ASD participants.

Hypothesis 4 – Interest and Familiarity, ASD Symptoms and Pretend

There was no interaction between SCQ scores and familiarity in predicting overall pretend play or OS (both $p > 0.56$), or between SCQ scores and interest in predicting overall pretend play ($p = 0.09$). However, there was an interaction such that the relation between interest and OS differed based on participants' SCQ scores (**Table 5**, Model 2). *Post hoc* probing of this interaction suggests that there was a positive relation between interest and OS when SCQ scores were low ($B = 1.35$, $p < 0.01$) and average ($B = 0.57$, $p < 0.05$; **Figure 2**).

Post hoc Analyses

Previous studies have reliably found that VIQ and ToM each play a role in pretend play production. In the present study, interactions were found between ASD symptoms and VIQ and between ASD symptoms and ToM, indicating a negative relation between VIQ and pretend play among those with more ASD symptoms and a negative relation between ToM and pretend play among those with fewer ASD symptoms. Given the surprising relation in the opposite directions between ASD symptoms and pretend play when taking into account these variables separately, characterizing how these processes impact pretend play outcomes may require one level of complexity higher than typically analyzed. That is, jointly operating to influence the relation between ASD symptoms and pretend play production. Further probing of these effects while controlling for age revealed that the effect of ASD symptoms on pretend play was moderated *simultaneously* (i.e., double moderation) by VIQ ($B = -0.01$, $p = 0.03$) and ToM ($B = 0.18$, $p = 0.003$). *Post hoc* analyses showed that the negative relation between ASD symptoms and pretend play was present *only* in those with low ToM and average or high VIQ ($B = -0.29$, $p = 0.005$ and $B = -0.49$, $p = 0.006$, respectively), as well as those with average ToM and high VIQ ($B = -0.25$, $p = 0.04$; **Figure 3**). That is, lower ToM and higher VIQ both related to less pretend play production among children with more ASD symptoms.

DISCUSSION

The current study examined ASD symptoms, as well as ToM, verbal ability, and interest in and familiarity with presented toys, as potential predictors or moderators of overall pretend and subtypes of pretend play spontaneously produced by children.

First, we hypothesized that measures of ASD symptoms would correlate with overall pretend and subtypes of pretend spontaneously produced, such that those with more ASD symptoms would engage in fewer actions of overall pretend, less APP and IO, and more OS. However, findings did not support this hypothesis, as ASD symptoms did not correlate with overall pretend or subtypes of pretend. Although, previous studies have shown that the overall pretend and subtypes of pretend differ between TD individuals and individuals with ASD (Libby et al., 1998), these differences in pretend production were not seen across children with varying degrees of ASD symptoms. This suggests that although the number of ASD symptoms may vary among TD children, this variance alone did not result in differences in either the amount of overall pretend or subtypes of pretend produced. It may be that a sufficient quantity of ASD-related deficits is required before ASD symptoms influence pretend ability.

Second, we hypothesized that established (ToM, verbal ability) and novel (interest in and familiarity with the presented toys) predictors of pretend would positively correlate with overall pretend. Additionally, we hypothesized that better ToM and verbal ability would result in more instances of APP and IO, and that more interest in and familiarity with the presented toys would result in more instances of OS.

TABLE 2 | Correlations among continuous variables.

	Age	IQ	SCQ	VIQ	ToM	FAM	INT	NP	NSP	PP	PP-OS	PP-APP	PP-IO
Age	1	0.27	−0.31	0.21	0.57**	0.38*	−0.21	−0.49**	0.36*	0.26	−0.08	0.289	0.03
IQ		1	−0.38*	0.81**	0.52**	0.15	0.10	−0.20	0.13	0.11	−0.14	0.13	0.06
SCQ			1	−0.53**	−0.42**	−0.46**	−0.20	0.34*	−0.41**	−0.01	−0.01	0.19	−0.22
VIQ				1	0.57**	0.19	0.16	−0.31	0.37*	0.01	−0.05	−0.06	0.12
ToM					1	0.11	−0.08	−0.53**	0.41**	0.24	−0.14	0.32*	0.03
FAM						1	0.24	−0.12	0.15	−0.003	0.14	−0.25	0.23
INT							1	0.10	0.11	−0.24	0.37*	−0.25	−0.20
NP								1	−0.59**	−0.63**	−0.23	−0.41**	−0.27
NSP									1	−0.26	0.05	−0.18	−0.16
PP										1	0.22	0.68**	0.46**
PP- OS											1	−0.10	−0.03
PP- APP												1	−0.25
PP- IO													1

*p < 0.05, two-tailed; **p < 0.01, two-tailed. SCQ, Social Communication Questionnaire; VIQ, Verbal IQ; FAM, Familiarity; INT, Interest; ToM, Combined Theory of Mind score (Theory of Mind Scale plus Strange Stories); NP, No Play; NSP, Non-Symbolic Play; PP, Pretend Play; PP-APP, Pretend Play-Attribution of Pretend Properties; PP-OS, Pretend Play-Object Substitution; PP-IO, Pretend Play-Imaginary Objects.

TABLE 3 | Hierarchical multiple regression predicting amount of observed spontaneous pretend play.

	Model 1			Model 2			Model 3		
	B	**SE B**	**β**	**B**	**SE B**	**β**	**B**	**SE B**	**B**
Age	0.69	0.38	0.29	0.72	0.43	0.30	0.73	0.51	0.31
ASD status	0.83	1.55	0.09	0.52	4.43	0.06	−1.78	4.71	−0.19
SCQ VIQ				0.01	0.20	0.02	0.80	0.76	1.64
ToM				0.00	0.05	0.01	0.07	0.06	0.29
				−0.12	0.53	−0.05	−1.61	0.67	−0.60*
SCQ × age							0.02	0.06	0.16
SCQ × VIQ							−0.01	0.01	−2.72*
SCQ × ToM							0.18	0.06	1.30**
Total R^2		0.08			0.08			0.35	
F for ΔR^2		1.63			0.02			4.23*	

*p < 0.05, **p < 0.01. ASD status, binary variable, confirmed using Autism Diagnostic Observation Schedule (Lord et al., 1999); SCQ, Social Communication Questionnaire (Rutter et al., 2005); VIQ, Verbal Intelligence Quotient (from KBIT-2; Kaufman and Kaufman, 2004); ToM, Theory of Mind Scale (Wellman and Liu, 2004).

TABLE 4 | Hierarchical multiple regression predicting imaginary objects subtype of pretend play.

	Model 1			Model 2			Model 3		
	B	**SE B**	**β**	**B**	**SE B**	**β**	**B**	**SE B**	**B**
Age	−0.02	0.28	−0.01	0.09	0.28	0.06	0.3	0.36	0.20
ASD status	−1.19	1.11	−18.0	−0.42	2.90	−0.06	−0.37	3.35	−0.06
SCQ VIQ				−0.09	0.13	−0.27	0.18	0.54	0.54
ToM				0.02	0.03	0.11	0.04	0.04	0.23
				−0.83	0.35	−0.44	−1.65	0.48	−0.88**
SCQ × age							−0.04	0.04	−0.56
SCQ × VIQ							−0.004	0.005	−1.17
SCQ × ToM							0.10	0.04	1.03*
Total R^2		0.03			0.19			0.32	
F for ΔR^2		0.59			2.28			1.99	

*p < 0.05, **p < 0.01. ASD status, binary variable, confirmed using Autism Diagnostic Observation Schedule (Lord et al., 1999); SCQ, Social Communication Questionnaire (Rutter et al., 2005); VIQ, Verbal Intelligence Quotient (from KBIT-2; Kaufman and Kaufman, 2004); ToM, Theory of Mind Scale (Wellman and Liu, 2004).

FIGURE 1 | Values below 0 are model-predicted values. Interaction between Social Communication Questionnaire [SCQ; i.e., history of many versus few autism spectrum disorder (ASD) symptoms] and theory of mind (ToM) Scale scores predicting amount of observed pretend play. Among those with low SCQ, a negative relation was found between ToM and pretend play. *$p < 0.05$. Low = 1 SD below sample mean. High = 1 SD above sample mean.
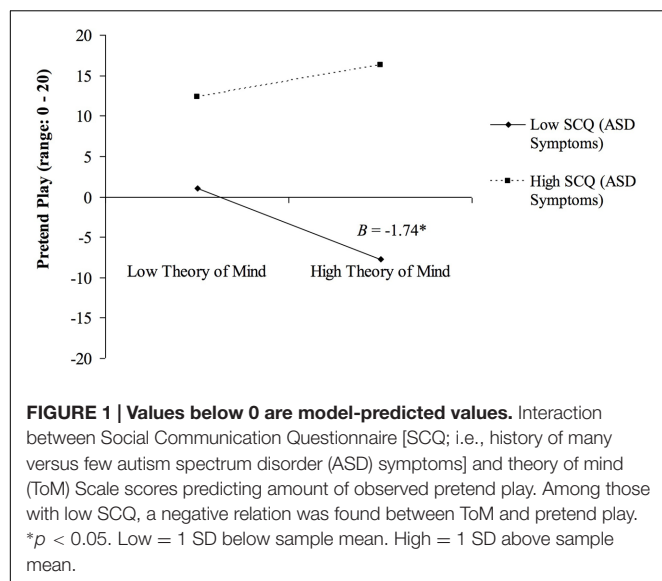
While previous studies have found compelling links between ToM ability and pretend (Taylor and Carlson, 1997), the current study found that, whereas better ToM was *not* correlated with overall pretending, it *was* linked to more instances of APP. This finding suggests that ToM ability might contribute more to engaging in and understanding certain types pretend. Furthermore, it is interesting that this link was only found with APP and not IO or OS. When engaging in actions of APP, children explore what else an object can do. Thus, both ToM and APP involve ascribing novel capacities to people (i.e., ability to know something they might otherwise not) and to objects (i.e., the ability to do something that they might otherwise not). This suggests that rather than emanating from a basic *metarepresentation* ability (Leslie, 1987), both ToM ability and the ability to attribute pretend properties may stem from a common *metaattribution* ability.

Additionally, more interest in the toys was linked to more OS. Interest in the toys was explored as a novel predictor of pretend and pretend subtypes on the basis that children might be more motivated to engage in higher levels of play, like pretend, if they were more motivated to play with the presented toys. Past literature suggests that interest in objects drives the play behaviors in which children choose to engage (Hidi et al., 2004). The finding that interest correlated with more OS suggests that those with more interest in the presented toys may engage in more *holistic* exploration of them. Holistic exploration means that children explore the characteristics of the entire object (e.g., toy car) rather than focusing on individual features of that object (e.g., wheels). OS may reflect such holistic exploration, as it is a subtype of pretend that involves exploring what else the whole object can be (in contrast to the other two types, which involve exploration of what else an object can do [APP] and what outside associations can be made [IO]). Whole OS is also more likely to be related to its shape (Smith and Jones, 2011), which translates to sensitivity to its spatial characteristics. This finding also indicates that interest in toys might play a previously unexamined role in the development of the ability to pretend among children. Interestingly, our results suggest that although interest may relate to the ability to engage in OS, the influence of interest may vary across different ASD symptomatology. Contrary to our hypothesis, while more interest in the presented toy is related to more OS among those with few or average ASD symptoms, no such relation was found between interest and OS among those with more ASD symptoms. High interest in specific toys may be related to broader cognitive rigidity (e.g., insistence on sameness, resistance to change) in children with greater ASD symptomatology (Carcani-Rathwell et al., 2006) and may interfere with the ability to consider the toy as a different object.

Thus, ToM and interest in the toys predicted distinct, hypothesized subtypes of pretend. These findings highlight the importance of directly examining and understanding different

TABLE 5 | Hierarchical multiple regression predicting object substitution subtype of pretend play.

	Model 1			Model 2		
	B	*SE B*	β	*B*	*SE B*	β
SCQ	−0.01	0.04	−0.05	−0.20	0.43	−1.16
ToM	−0.03	0.07	−0.08	0.05	0.10	0.13
VIQ	−0.01	0.02	−0.10	−0.03	0.03	−0.36
FAM	0.12	0.39	0.06	−0.16	0.53	−0.7
INT	0.66	0.31	0.36*	1.45	0.51	0.79**
SCQ × ToM				−0.01	0.02	−0.32
SCQ × VIQ				0.004	0.003	1.95
SCQ × FAM				0.08	0.11	1.52
SCQ × INT				−0.16	0.07	−2.21*
Total R^2	0.40			0.54		
F for ΔR^2	1.31			1.35		

*$p < 0.05$, **$p < 0.01$. ASD status, binary variable, confirmed using Autism Diagnostic Observation Schedule (Lord et al., 1999); SCQ, Social Communication Questionnaire (Rutter et al., 2005); VIQ, Verbal Intelligence Quotient (from KBIT-2; Kaufman and Kaufman, 2004); ToM, Theory of Mind Scale (Wellman and Liu, 2004); FAM, Familiarity; INT, Interest; SCQ × FAM, Interaction between familiarity with toys and SCQ; SCQ × INT, Interaction between interest in toys and SCQ.
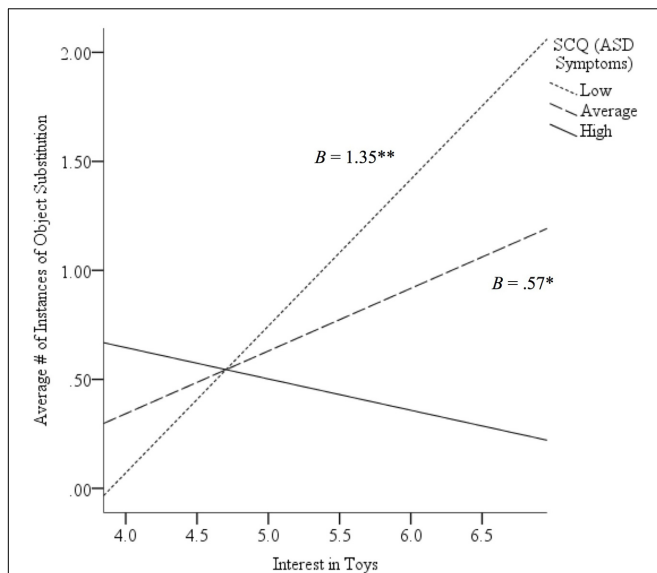
FIGURE 2 | Relation between level of interest in toys and observed instances of object substitution (OS) based on high, average, or low scores on the Social Communication Questionnaire [SCQ; i.e., autism spectrum disorder (ASD) symptoms]. While there was a positive relation between interest and quantity of OS for those with a history of few or average ASD symptoms, this relation was not found for those with a history of more ASD symptoms. $*p < 0.05$, $**p < 0.01$. Low = 1 SD below sample mean. Average = sample mean. High = 1 SD above sample mean.

FIGURE 3 | Simultaneous moderation by ToM and verbal ability (VIQ) on the relation between ASD symptoms and pretend play. More ASD symptoms related to less pretend play production when ToM was low and VIQ was average or high, and when ToM was average and VIQ was high. All other relations were non-significant. The negative relation between ASD symptoms and pretend play was especially pronounced among those with low ToM and high verbal ability. $*p < 0.05$, $**p < 0.01$. Low = 1 SD below sample mean. Average = sample mean. High = 1 SD above sample mean.

types of pretend. This, in conjunction with our finding that pretend subtypes were not significantly correlated *with each other,* further stresses the importance of dissociating subtypes of pretend.

Conversely, although previous literature has suggested a link between verbal ability and pretend among TD individuals (Lewis et al., 2000; Rutherford and Rogers, 2003) findings from the current study indicated that verbal ability did not predict overall pretend or subtypes of pretend produced. However, previous literature has used much younger samples of TD participants; for example, all of Rutherford and Rogers' (2003) participants were younger than 4 years old and Lewis et al.'s (2000) ranged in age from 1 to 6. Furthermore, our findings are consistent with previous literature that did not find a relation between verbal ability and pretend production among certain samples, such as individuals with ASD (Rutherford and Rogers, 2003). This suggests that although verbal ability may relate to the ability to produce actions of pretend it is possible that verbal ability's influence varies across populations and diminishes with age. Additionally, the current study used a more conservative measure to code pretend in order to ensure that coders were certain that each instance of pretend coded was in fact pretend. Thus, it is possible that the link between verbal ability and pretend disappears when more rigorous, conservative measures are used to assess pretend play (Lillard et al., 2013).

Familiarity with the toys was also not shown to predict either overall pretend or pretend subtypes. Whereas past literature has suggested that more familiarity with toys indicates better
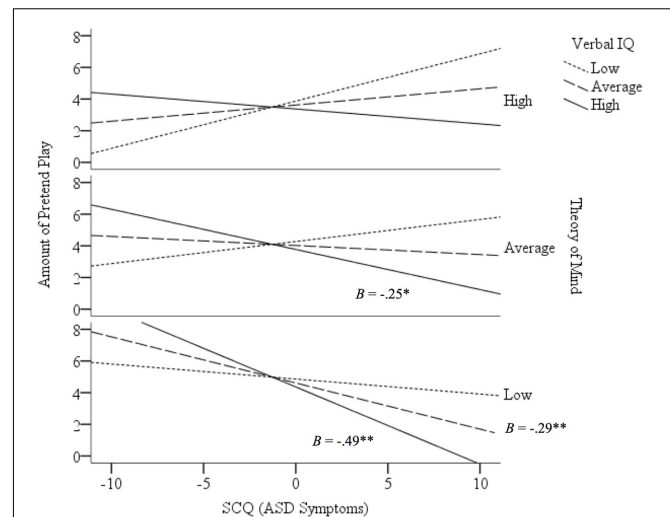
knowledge and understanding of the characteristics of those toys (Hidi et al., 2004), the current study's findings suggest that perhaps familiarity does not induce participants to engage in pretend with presented toys. That is, knowing what a toy is may not be sufficient to prompt greater exploration of it as an object with which to pretend.

Third, we hypothesized that the links between ToM, verbal ability and overall pretend produced would be stronger for those with fewer ASD symptoms compared to those with more symptoms. We also hypothesized that better ToM and verbal ability would result in more instances of APP and IO for those with fewer ASD symptoms compared to those with more symptoms. However, no significant interaction was found. Perhaps this was because the current study looked at ASD symptoms within TD children rather than conducting a direct comparison between TD children and children with ASD. Again, it may be that it takes a sufficient quantity of ASD-related deficits before these ASD symptoms are able to highlight distinct differences in the way ToM and verbal ability influence production of pretend.

Finally, we hypothesized that the links between interest in and familiarity with toys and overall pretend produced would differ based on ASD symptoms, such that these relations would be stronger for those with more ASD symptoms compared to those with fewer symptoms. We also hypothesized that more interest in and familiarity with the presented toys would result in more instances of OS for those with more symptoms of ASD compared to those with fewer symptoms. Although we again found no effect for familiarity, there was an interaction such that the relation between interest and OS differed based on SCQ scores. Contrary

to our hypothesis, while there was a positive relation between interest and OS across the sample, this relation was stronger when SCQ scores were low. As noted by the weak central coherence (WCC) theory, youth with ASD (as well as TD youth with more ASD symptoms) tend to demonstrate a detail-focused cognitive style, and have consequent difficulty seeing the "big picture" in various contexts (Happe and Frith, 2006). More holistic exploration (i.e., OS) with a toy may be seen as a play-based behavioral indicator of such "big picture" engagement. Thus, this finding is consistent with the WCC theory, as it suggests that individuals with more ASD symptoms might tend toward relatively more detail-focused engagement with toys rather than the holistic type of play reflected in OS. This is also consistent with recent work (Russell-Smith et al., 2012) indicating a relation between detail-focused cognitive style and ASD-like impairments in social development in TD individuals. This result further highlights the importance of considering subtypes of pretend play when examining its relation to cognitive development, and future work should explore this intriguing link between OS and features related to ASD.

Additionally, *post hoc* analyses indicated that developmental delays in communication, but not reciprocal interaction or restrictive repetitive behaviors, seemed to drive this relation. This finding, along with the finding of no interaction between verbal ability and SCQ scores in predicting pretend, suggests that historical (rather than current) impairments in development of communication ability might prevent children from being able to connect their interest in toys to pretending in very sophisticated ways with the toys (i.e., OS). However, while the interaction effect for communication was larger than either reciprocal interaction or restrictive repetitive behaviors, it is important to note that the interaction was only marginally significant. Thus, it appears that aggregate ASD symptoms appear to best account for this effect.

Results suggest that, while ASD symptoms are not a predictor of spontaneous pretend play on their own, there are unexpected negative relations between ToM and pretend play associated with ASD symptoms, as well as between VIQ and pretend play associated with ASD symptoms. Given the reliable findings in previous studies of relations between each of these variables, it is important to consider the role that ToM and VIQ can play *simultaneously* in pretend play production in children with varying degree of ASD symptoms. Specifically, the predicted negative relation between ASD symptoms and pretend play was more pronounced in those with low ToM ability and high verbal ability. Previous inconsistent findings in relations of VIQ, ToM, and pretend play may be related to variability in ASD symptoms in sampled populations, and it is notable that the relation between ASD symptoms and pretend play was clarified in the current study only by examining effects of ToM and VIQ together on such relation. Whereas, ability to pretend are both require the ability to be metarepresentational (Leslie, 1987), verbal ability may not require metarepresentational capacity (Breheny, 2001) and may involve non-metarepresentational diversion of cognitive resources. For example, this may help explain the pattern of play seen in children with ASD who presents with good verbal ability (e.g., those who are hyperlexic or hyperverbal; Grigorenko et al.,

2002) but show poor ToM and show difficulties with pretend play production.

Limitations and Future Directions

Although this study provided a novel inquiry into predictors of spontaneous pretend play in children with and without ASD, there are (as always) several limitations. First, the sample size was relatively small, and while this study examined ASD symptoms in TD youth and ASD youth, the ASD sub-sample was very small. Thus, it cannot strongly support any contention that observed findings relate to ASD symptoms and not other factors (e.g., delays in communication development) to which the employed measures may be sensitive. Likewise, if deficits in pretend play are truly specific to those who meet diagnostic criteria for ASD (i.e., are pathognomonic), then this study would be underpowered to detect the hypothesized severity-related effects, even if they were present. Thus, future studies should explore the same predictors (ToM, verbal ability, familiarity, and interest) with a bigger sample with greater variability in ASD symptoms in order to reveal the relations between these variables more clearly.

Second, the age of participants was fairly broad, ranging from age 4 to age 8. Indeed, the types of play that children engage in across these ages do tend to vary (Johnson, 1998). Because of the relatively wide age range, and consequently diverse forms of play emerging across the age range, there is a possibility that different play behaviors were categorized similarly by the coding system. Future studies should examine narrower age ranges in larger samples in order to develop richer picture of how and what pretend play looks like in this paradigm at specific points in development.

Third, we used a measure that provided only a rough approximation of past history of ASD symptoms. The SCQ is a measure of historical ASD symptoms, not present. Thus, future studies should employ continuous measures of contemporaneous ASD symptoms, such as the Autism Spectrum Quotient – Children's Version (AQ-Child; Auyeung et al., 2008) or the Social Responsiveness Scale-2 (SRS-2; Constantino and Gruber, 2012) to obtain a current measure of ASD symptoms.

Fourth, the pretend play coding scheme was a novel system for coding pretend play and play type. While the system proved to be reliable and rigorous, it is difficult to make direct comparisons to past studies that also looked at production of pretend play but used different measures. Future studies should use similar systems when coding actions of pretend play and play type with toys to determine if similar findings occur. Future studies should also examine differences in pretend play patterns as driven by interest and familiarity in a specific toy. This will not only serve as a validity check for the procedure itself (i.e., do children whose parents identify dolls as toy with highest interested and familiarity show pretend play with dolls the most) but also augment the utility of this novel paradigm.

Finally, the system we created for coding pretend play and play type also used a very conservative estimate of pretend. We chose to take a more conservative approach to coding pretend to ensure that coders were absolutely certain an action with the toys was pretend before coding it. However, by taking this more conservative approach, it is possible that certain instances

of pretend were missed, especially for subtypes of pretend with low frequency of occurrence like OS. Taken together, this study would benefit from replication to further support the unexpected findings.

Clinical and Theoretical Implications

This was the first study to examine the relation between ASD symptoms in children across typical and atypical development and observed spontaneous pretend play. It was the first to examine the relation between novel predictors (interest in and familiarity with presented toys) and pretend play. Finally, it was one of the first to carefully consider predictors of differences in subtypes of pretend.

One of the strengths of the current study was that it presented a new system for coding and assessing pretend play and play types with different toys. This coding system, while novel, proved to be a rigorous, conservative, reliable measure of play type using blinded raters (a crucial, under-represented approach in this literature; see Lillard et al., 2013), and may prove to be a useful measure for future research studies aiming to code play type with objects. Indeed, based on the methodological strengths of this measure, these results can be seen to shed new light on the prediction of pretend.

This study suggests that ASD symptoms are *not*, on their own, a predictor of spontaneous play with toys in children. However, our results highlight the importance of how varying degree of ASD symptoms may interact with child's verbal ability and ToM to influence production of pretend play. It also suggests that abnormal play behaviors may be truly unique to those meeting criteria for ASD at differing levels of ToM and verbal ability, and may thus provide a valuable indicator of deficits and treatment response within this population based on individual profile of cognitive abilities.

This study also suggests that supposedly established predictors of pretend (verbal ability and ToM) do not appear to relate to pretending when a more rigorous measure is applied, indicating that these relations in previous studies may be due to experimenter effects (as suggested by Lillard et al., 2013). On the other hand, that ToM related to a theoretically-similar subtype of pretend (APP) suggests that pretending may be a more complex, multifaceted construct, and that consideration of subtypes may provide a better window into play.

Additionally, this study suggests that interest in toys might be an important predictor of certain subtypes of pretend, specifically OS, that until now have gone unexamined. Furthermore, the finding that interest was a strong predictor of OS among participants, and that this relation differed based on number of ASD symptoms, suggests that interest might prove to be a predictor of pretend among individuals with ASD.

Finally, that interest in toys predicts OS suggests possible implications regarding how certain types of pretend might develop among children. For instance, interest in an object might lead to holistic exploration of that object, which in turn may result in a child exploring (and pretending) what else that object can be (OS). Findings regarding the subtypes of pretend provide deeper insight into the factors that influence the development of the ability to pretend. By gaining a better understanding of what factors contribute to the development of pretend among both TD children and ASD populations, we are better able to understand why some individuals (such as those with ASD) might have difficulty with certain types of pretend and how pretend might develop differently among these individuals.

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Find the Hidden Object. Understanding Play in Psychological Assessments

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Standardized psychological assessments are extensively used by practitioners to determine rate and level of development in different domains of ability in both typical and atypical children. The younger the children, the more likely the trials will resemble play activities. However, mode of administration, timing and use of objects involved are constrained. The purpose of this study is to explore what kind of play is play in psychological assessments, what are the expectations about children's performance and what are the abilities supporting the test activities. Conversation Analysis (CA) was applied to the videorecording of an interaction between a child and a practitioner during the administration of the Bayley Scale of Infant and Toddler Development, III edition. The analysis focuses on a 2′07″ long sequence relative to the administration of the test item "Find the hidden object" to a 23 months old child with Down syndrome. The analysis of the sequence shows that the assessor promotes the child's engagement by couching the actions required to administer the item in utterances with marked child-directed features. The analysis also shows that the objects constituting the test item did not suggest to the child a unique course of action, leading to the assessor's modeling of the successful sequence. We argue that when a play frame is activated by an interactional partner, the relational aspect of the activity is foregrounded and the co-player becomes a source of cues for ways in which playing can develop. We discuss the assessment interaction as orienting the child toward a right-or-wrong interpretation, leaving the realm of play, which is inherently exploratory and inventive, to enter that of instructional activities. Finally, we argue that the sequential analysis of the interaction and of the mutual sense-making procedures that partners put in place during the administration of an assessment could be used in the design and evaluation of tests for a finer understanding of the abilities involved.

Keywords: play, psychological assessments, down syndrome, conversation analysis, learning disability

INTRODUCTION

This paper looks at play within standardized psychological assessments. It analyses in detail the administration of the test item "Find the hidden object" of the Bayley Scale for Infant and Toddler Development, 3rd edition, to a 2 year old child. The scale is designed to determine developmental delay; the child observed has Down syndrome.

The study will explore what kind of play is play in a psychological assessment, what are the embedded expectations about children's performance and what is the interactional infrastructure supporting the assessment activities.

The study is conducted within an ethnomethodological framework and considers the full ecology of the activity under scrutiny, including the multimodal components of communication and the material features of the setting.

ASSESSING DIFFERENT CHILDREN

Assessing the nature and extent of children's difficulties is key to a number of highly consequential decisions for children and their families: whether they need speech and language therapy or learning support, whether they can be included in mainstream schools, whether parents and teachers need to be involved in the children's care.

Psychological assessments vary from standardized tests to less structured forms of evaluation, such as interviews or observation of free play. The latter types are based on specific behavioral indicators but also on more holistic perceptions of the assessor about a child's abilities, reactivity, and social and emotional adjustment. Standardized assessments, on the other hand, have the advantage of giving quantified descriptions of a child's level of (dis) ability that are more easily communicable and transferable, as well as allowing to measure change at different time points.

Some assessments are designed for testing particular deficits in specific populations, such as the False Belief Test that examines Theory of Mind in children with Autism (Baron-Cohen et al., 1985), whereas others, like the Bayley we examine here, measure a broader umbrella of abilities and is administered to children with very different types of difficulties or conditions. This second type of test positions the child on a variety of dimensions measured through the scoring they achieve on different subscales. Very often test-items included in the sub-scales do not descend from clearly specified developmental theories, or the experiments that may have been carried out to confirm those; instead, like in the Bayley, they may have been assembled from previous tests, and rearranged for order and features of trials. These tests therefore rely on an eclectic theorization, as well as on general ideas about the way children function, to inform the choice of particular test-objects and trial administration techniques.

The robustness of standardized assessments lies in the procedures aimed to establish their validity. Such procedures include administering them to large samples of individuals and correlating scores with other existing scales. These are accepted procedures in psychology, but they also means that the world of tests lives in and of itself, being able to produce new measuring tools but progressively losing connection with the research around determinate clinical conditions (Millon, 1987; Cicchetti, 1994).

A recurrent observation about standardized assessments is that full standardization is very difficult to achieve (Marlaire and Maynard, 1990; Antaki et al., 2002; Maynard et al., 2002). Assessments are administered in and through interactions; human interaction, in its verbal and non-verbal components, is organized to its more minute details and comprises largely automatic and habitual communicative patterns (Sacks, 1992). The behavior of the tester is unlikely to fully resist acts suggested by the interactional organization despite the test's manual recommending it. Test administrators, for example, have been shown to give feedback, and also different feedback after success or failure, when it is not supposed to happen. This may impact the motivation of the person under examination, and also induce inferences about right and wrong answers, causing "learning within the task" (Maynard, 2005) and uncontrollable effects on the overall performance.

The interactional organization can impinge on tests in other ways, independently from the violation of the test rules. For example, if a question is asked twice in ordinary conversation, speakers understand it as a request for repair, namely that the first answer needs to be in some way amended because it was not right or had not been understood or heard properly; a person under test requested to perform the same behavior twice (as many test do to confirm that a skill is actually possessed) may instead do something different, under the interpretation of having got it wrong the first time. Maynard and Marlaire (1992) refer to these occurrences as part of the "interactional substrate" of assessments, and notice the scarce attention they are accorded to within the world of test design and use.

Our study falls within an area of research in Conversation Analysis (CA), substantially shaped by the work of Maynard and Marlaire cited above, that examines the interaction occurring in the course of established assessment practices in clinical work. Research in this area focuses on how participants cooperate in the achievement of the assessments' outcomes and identifies the sense-making procedures made relevant there and then by participants for each other. Interactional studies of assessment, while at times highlighting the limitations of these tools, do not aim to undermine them but rather to provide a broader understanding of how they function, for both interactionist researcher and practitioners to build on to. Following the terminology used in Hasson and Botting (2010), Muskett et al. (2012) propose that "static" standardized assessments can be complemented by "dynamic" ones that take into account the interactional vicissitudes of the test administration, highlighting competences that the fixed scoring systems would not pick up. As recalled elsewhere (Fasulo, 2015), a rounder evaluation which would engage the child and also gather information from other sources was a default procedure in the early decades of psychological testing, even for the IQ test, so integrating different evaluations is not necessarily disruptive of the ethos of psychological assessments.

The present study looks at a test that, being addressed to young children, is designed as a series of play activities. The analysis will thus attend to the way a play framework is implemented through the test procedures, both those prescribed

to assessors and those spontaneously mobilized to carry out the activities.

WHAT IS PLAY FOR YOUNG CHILDREN?

Definitions of play abound and are constantly updated, as none can exhaust the infinite variety this activity can embody. Classic and broad definitions include lack of immediate utility (Huizinga, 1992/1938) and voluntary participation (Caillois, 2001), although there may be exceptions to those as well (Sicart, 2014).

Benefits of play have been recognized across different domains, developmental and psychological in general. The benefits are linked to different characteristics of play. For children, they are seen to stem from play including both structure and improvisation (Sawyer, 1997), allowing children to be creative and elaborate their experience along predefined routes. Perspective-taking is notoriously one of the most important functions GH Mead (1934) saw in playing games, i.e., structured social event built around a set of rules and roles; through playing games, he argued, children understand that social roles are positional and learn to imagine the world from another person-role perspective.

Some see a socialization benefit in the rehearsal and familiarization with activities of the adult world (Lancy, 1996); this kind of benefit, it is also argued, is not unique to humans. Animal play has been recognized many functions, including that of exercising flexibility rather than learning repetitive patterns of behavior (Bekoff and Byers, 1998). Generally, following Bateson's insight about play as happening within a communicative *frame* (Bateson, 1956), it is rather safe to say that play develops tools for the fine layering and articulation of meaning, bestowing on intra- and interspecific communication a wider range of possibilities[1].

Rules are central in play as they are constitutive of the alternative sphere of reality play lives in. However, first, in the classic distinction between play and games it pertains only to the latter to be *dependant* on rules for their existence; secondly, even within games, players are seen to bend, or recreate rules and develop different games from within the original ones. True play, in other words, has always the power to reinvent itself (Sicart, 2014). A fundamental characteristic of play is in fact *appropriation* (Henricks, 2006), i.e., the capacity to invest of new meaning any setting or object at hand and make it become what the players wish it to be. The appropriative nature of play makes game design or play scripts subservient to playing itself: those can support and extend players' imaginative capabilities, but play can happen without pre-designed artifacts or can put them to different use than they were originally designed for.

The characteristics of play described above are in various degrees related to the fact that play is an instrument for self-creation and self-expression through shared semiotic means, in this similar to language (Sutton-Smith, 1997). Without the freedom to interpret a play situation, the essence of play would be gone, although the situation can retain formal play features. In the same vein, toys can cue certain actions or cue play as such,

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[1]The notion of frame was later elaborated by Goffman (1974) into an encompassing theory of communication.

but they are not to be seen as imposing limits to play; as Sicart (2014: 44) argues, toys can be used as a starting point to *filtering* the reality around them to create an apt play environment. The toys' own physicality, on the other hand, is crucial in orienting the shape and experience of play.

It is difficult to ascertain to what extent young children, especially if pre-verbal or with low verbal capabilities, distinguish play from other activities they are involved in. Observations of children in the first year of life show that caregivers and children participate in play routines - such as nursery rhymes, interactive songs and the like–that engage simultaneously multiple senses and modalities (for example associating singing with touching and moving the body) and have recognizable trajectories (Fantasia et al., 2014); at the same time, many functional activities, such as feeding (Costantini, 2015) or nappy changing (Nomikou et al., 2016) are suffused with play and present similar characteristics of regularity and multimodality.

Objects enter the world of children since the early days, initially designed to stimulate children in rather passive ways, with their sound and tactile properties, –like with like infants' books (Rossmanith et al., 2014)–then increasingly imbued with "narrative programmes" (Greimas and Courtés, 1982) that comprise a diversified range of actions. Objects that children can engage with are not limited to toys: sheets, clothes, care products, feeding accessories and the like can also be manipulated and explored. Non-functional, explorative manipulation of objects is a spontaneous activity in children and can be picked up by caregivers to extend the child's repertoires of actions and favor participation in mediated interactions (van Oers, 1998).

The research on play summarized above will inform our analysis of the administration of the Bayley's item "Find the hidden object," particularly as concerns explorative aspects of play and the role of objects in the activity.

CHILDREN WITH DOWN SYNDROME AS INTERACTANTS

In the following we will briefly summarize only the characteristics of children with Down syndrome that are relevant for their ability to partake in social interaction.

Children with Down syndrome tend to be delayed in language development, for a combination of reasons, including hearing deficits due to congestion of the middle ear ("glue ear") and issues with working memory that may make long sentences difficult to deal with. Their receptive vocabulary is closer to typical levels than their productive one: they often present limited syntactic abilities, so their utterances may often be incomplete; finally they may have difficulties in articulation due to morphology of the mouth (Chapman and Hesketh, 2000).

Conversational skills in children with Down syndrome are higher than those of children with the same level of expressive linguistic development; the quality of their social relationship is similar to that of typical children and higher on average than observed in children with Williams syndrome or Specific Language Impairment (Laws and Bishop, 2004). As the children grow older, the linguistic performance can be lower than the

cognitive ability would allow, suggesting the effect of restricted opportunities for interactions in the first years compared to typical children (Gullberg et al., 2008).

Overall, children with Down syndrome appear well equipped to engage in prolonged social interactions, provided that the speech addressed to them is not overly complex and the interlocutors learn to overcome occasional disfluencies in their speech.

THE BAYLEY-III TEST AND THE ITEM "FIND THE HIDDEN OBJECT"

The first Bayley Scales of Infant and Toddler Development was designed by Nancy Bayley in 1969, on the basis of several experiments she herself conducted in the early 60s. Two more editions were since published, one in 1993 and one in 2005 (Bayley, 2005); the last edition includes more sub-tests with the aim of distinguishing more clearly between cognitive, linguistic and social-emotional abilities (Albers and Grieve, 2007; Maccow, 2008).

The Bayley-III can assess children from 1 to 42 months and can take 30–90 min to administer, depending upon the age of the child. The main declared purposes of the Bayley-III are to identify children with developmental delay[2] and to provide information for intervention planning; however, there is not much evidence supporting the utility of the Bayley III for intervention (Albers and Grieve, 2007). The assessment is derivative of several scales based on older and newer concepts in developmental studies and has therefore an eclectic theoretical foundation (Albers and Grieve, 2007).

The Bayley is a so called power test, i.e., one in which items are ordered according to their degree of difficulty. Children start at an age-specific point and have to pass three consecutive items on that level to go further, otherwise they are made to start again at a lower age level. The administration is stopped when the child has scored 0 in five consecutive items (Maccow, 2008). The Bayley-III comes with a thick manual containing detailed instructions, and adherence to the standardized procedures is recommended to enable use of the quantitative results of the test.

The task "Find the hidden object" is part of the Cognitive Scale, which assesses children's play skills as part of their cognitive abilities (Maccow, 2008). This test item was present in older version but used different materials, i.e., children had to find an object hidden under rather large cups. In the new version, they need to find a pink plastic bracelet under one of two pale yellow facecloths. The change was introduced because of observed difficulties in manipulating the cups.

This study, building on Shukla's (2010) finding that several children in her sample failed this task for reasons seemingly unrelated to a lack of the abilities the item is supposed to measure, apply sequential analysis according to CA procedures to one

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[2]The delay is established according to following criteria: 25% delay in functioning when compared to same age peers, standard deviation units below the mean of a reference group and performing a certain number of months below chronological age (Maccow, 2008).

complete episode of "Find the hidden object," with the following aims:

(a) To investigate the nature of play within the assessment, both as a framework for the test activities and as a set of skills measured by them;

(b) To identify the interactional details leading to different outcomes across repeated trials;

(c) To explore to what extent this kind of assessments can contribute to the understanding of individual children, or of a condition like Down syndrome more generally.

DATA AND METHODS

The filmed data on which this study is based comes from a center for the support of children with Down syndrome and their families in the south of England. The administration of the Bayley was video-recorded as part of the standard practice of the center; for this study the selected families were contacted again for authorizing further analysis on the data.

Within a corpus of 40 children recorded doing the Bayley at two different ages (one around 12 and one around 24 months), 6 were originally selected on the basis of selected items of the MCHAT scale (Modified Checklist for Autism in Toddlers; Robins et al., 2001). This scale is compiled by parents of toddlers and asks them to report presence/absence of behaviors that may be relevant for a diagnosis of autism. Responses from 11 out of 23 questions, pertaining to range of movements and communication abilities, were used to in order to have a varied group of children for the interactional analysis (Shukla, 2010). The study led to the identification of the item "Find the hidden object" as particularly useful to illustrate the functioning of play within assessments and the interactional resources mobilized in the assessment situation.

In this paper we examine the administration of the test-item to one child, Kevin, 23 months old at the time. Like most of the studies cited in the introduction for this research area, this work uses a single-case approach in order to ground the analysis in numerous conversational episodes and throughout unfolding interactional events.

The sub-sample of MCHAT responses indicated that Kevin had difficulties in walking and hearing and did not frequently engage in active practices of joint attention.

The assessment was conducted by a woman professional. Kevin's father was also present and in this particular trial was keeping him on his lap. Assessor and parents are often visible in the recordings, but they have been purposefully cut out from the frame grabs used in this paper.

The section of the video analyzed lasts 2′07″ and includes four trials, the first three of which will be presented in the results section. The whole section was watched repeatedly and fully transcribed according to Jeffersonian conventions (Jefferson, 2004a; see Appendix for a legend of the symbols; the child's name used in the transcript is a pseudonym). Transcripts include descriptions of most gestures, expression and postural changes, as well as features of voice quality that are not captured by transcription symbols. Frame-grabs illustrating action at relevant analytical points have been added as photo-strips, each single

photo referred to in the transcript as G. 1a, G.1b etc., with G indicating grab, numbers referring to the Figure which includes the grab and a, b, c indicating the specific grab in the strip.

RESULTS

As explained above, we will examine the first three of four trials that the administration of the item "Find the hidden object" was comprised of. By 'trial' we mean a cycle of activity that starts with hiding the object and ends after the child performs an action upon the object or its cover. The child did not succeed within the first two attempts, so technically he did not pass this item, but it is customary in assessments to try to achieve success anyway; the third and fourth trials see Kevin consecutively succeeding in finding the object hidden on different sides, as per the test requirements.

The child had encountered the same materials—bracelet and facecloths–in the previous round of testing, on the same day, for the lower age level; the task at that level only requires finding the bracelet under the cloth right after it is put there, whereas in the second round the cloths are swapped around before letting the child attempt to find it. Kevin had succeeded uncovering the bracelet at the first trial during the first testing round, but had failed to do so twice consecutively on opposite sides. This is why the assessor comments on this item being a "tricky one" at the beginning of the new presentation.

The extract below shows how the activity is set up. The child is sitting on his father's lap with the chest touching the edge of the empty table in front of him. He is restricted in his movements apart from the arms and head, his position maximizing his access and focus on what happens right in front of him, namely what the assessor does and what she puts on the table.

Extract 1 [Figure 1]

Figure 1(a), Figure 1(b), Figure 1(c).
((*The assessor (A) is leafing through the manual; Kevin (K) looks at her then bangs the palms on the table*)) **G. 1a**

1 Assess: Whe:re are we ↑<u>no</u>:w= ((*reading manual, K looks up*)) **G. 1b**
2   =oh this a tricky <u>o</u>:ne,
3   (1.5) ((*A gets up to take the material – K follows her with his gaze*))
4 Assess: ((*sits down*)) <This <u>i</u>:s a <u>t</u>ricky <u>o</u>:ne.> ((*K looks at the objects*)) **G. 1c**
5 Kevin: Uhduh<u>dh</u>u:dhu,
6 Assess: Yeah:, ((*smile voice*))

Extract 1a begins with the assessor who, after consulting the manual to check what the next test item will be, comments loudly on that "=oh this a tricky <u>o</u>:ne,", apparently addressing both parent and child. She then gets up to fetch bracelet and cloths. Kevin follows her with his gaze and bangs his hands on the table, then keeps his hands flat open there. His demeanor indicates engagement with the situation and the expectation that the assessor will make something happen, most likely with objects appearing on the table as she has been doing regularly for the last 20 minutes or so.

The assessor sits back at the table and repeats the sentence with more accentuated child-directed communication features, i.e., louder, more staccato and slow, with more emphasis (Baron, 1990). After this, Kevin produces a rather long vocalization (line 5) followed by the assessor's "Yeah:" (line 6) in "smile voice" (Jefferson, 2004b). Both assessor and child seem thus to be orienting to the situation as an interactional one, an object-mediated playing together, introduced by this vocal exchange. In the continuation of the sequence, in **Extract 2**, we can see how the play frame is sustained by the assessor throughout the delivery of the trial.

At the beginning of **Extract 2**, the assessor shows the bracelet to Kevin, with verbal and gestural highlighting (Goodwin, 2003[3]), and he immediately reaches for it. When the assessor then covers it with the cloth and starts moving it, the child's touching and pinching the cloth looks like an attempt to keep track of it and take it from under the cloth (G. 2a,b). The rest of the sequence shows the child shifting his gaze to the hand that has crossed over to the right, then looking at the assessor when she asks him to find the bracelet, then down again at the cloths now free from the assessor's hands. At this point Kevin gleefully brings both cloths up toward his face, with a vocal comment (line 30) and pays no attention to the bracelet he has thereby uncovered. The combination of gesture and vocalization makes the picking up of the cloth an interactional move, with "response" properties with regard to the the assessor's questioning in lines 26 and 28. The assessor takes up the child's utterance with a "=<u>Y</u>:e⌈ah" (line 31) then comments that the child had "wanted" to do something else entirely (line 31 "you want to take [both at the same t:ime,=)[4].

This sequence could be interpreted as showing the child's failure in keeping the focus on the bracelet and identify its position after it was moved. The analysis, however, makes at least plausible that Kevin is playing a different game here, one centered on the human interactant rather than on the bracelet. The child's attention appears mostly focused on the assessor throughout the episode: when he attempts to grasp the bracelet initially, it is after she has offered it to him. When she then rests her hands on the cloths, it is the cloths that Kevin tries to grab, her resistance to let go of it possibly making it even more playful. Finally he picks up the now free cloths vocalizing and smiling. In essence the assessor, by talking in a playful voice throughout

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[3]Goodwin defines highlighting "a way of re-organizing a domain of scrutiny in terms of the tasks of the moment" (2003, p.245).

[4]This comment is addressed to the father despite the second person pronoun is indexing the child, and the father laughs. It is common for test administrators to take care of the parents' accountability about their child's performance.

Extract 2 [Figures 2 and 3]

Figure 2(a), Figure 2(b), Figure 2(c).

Figure 3(a), Figure 3(b), Figure 3(c).

7	Assess:	You <u>wat</u>ching <u>th</u>is one again?
8		ready::?.phhhh [oo:ooh
9		[((A places cloths on the table))
10		(0.7) ((A refolds one of the cloths))
11	Assess::	[You watching?
12		[((A holds bracelet vertical in front of K))
13		I'm gonna hi::de the bracelet,.oh::
		[under he:re-you w↑atchin?
14		[((A slowly hides bracelet under cloth
15		[((K reaches out for the bracelet))
16	Assess::	.Hhhh [w↑atchin?
17		[((A presses the palms of her hand on top of the cloth))
18		[((K puts his fingers on the edge of the cloth)) **G. 2a**
19	Kevin:	[Hhhe=
20	Assess:	=[Ohooooooo:::!
21		[((A begins swapping the cloths crossing her arms))
22		((K, pinches and pulls at the edge of the bracelet-cloth when it passes in front of him)), **G. 2b**
23		A keeps the cloth down.
24		K's gaze stays in the middle, where the non-bracelet cloth comes into vision)) **G. 2c**
25	Assess:	°U.h:. ((K gazes at her))
26	Assess:	Where is the <u>bra</u>:celet?
27		(.3)
28	Assess:	°Where [<u>i</u>:s it?°
29		[((K reaches for both cloths)) **G. 3a**
30	Kevin:	Hehethe:::= ((brings both cloths toward face, deep smile) **G. 3b**
31	Assess:	=<u>Y</u>:e[ah you want to take [both at the same t:ime,= **G. 3c**
32		[((A takes cloth from K))
33	Father:	[Hehehehehe

and accompanying each small part of the trial with utterances addressed to the child, might have been creating a framework in which the child was relating primarily to her and engaging

with the objects she had also been physically engaged with[5]. Furthermore, because many of the previous test items involved the child imitating what she did, Kevin might have monitored her actions in order to do the same thing again, which in this case would have been manipulating both cloths together with the two hands.

For what concerns his focus on the target object, it can be hypothesized that the soft and warm facecloths were equally interesting to him than the plastic rigid bangle; indeed, Kevin does not seem to be interested in the bracelet once its connection with the assessor is lost, but shows evident pleasure in manipulating the cloths. So, it can at least be said that the "failure" of the child to keep track of the bracelet and uncover it might be due to the very mild attraction the object exerts upon him. Whatever the case, and possibly a combination of both, namely the child might have "forgotten" the bracelet or been unable to discover its position, while also having found a new object of interest, the sequence shows that the child is engaged primarily with the human interactant and responsive to her.

Before the next trial (**Extract 3**), the assessor spends some time enhancing the salience that the bracelet–or the grabbing of it–has for Kevin. She offers him the bracelet, and, when he takes hold of it, she marks the action with effusive praising.

Before reiterating the trial, the assessor models "success" by letting Kevin grab the bracelet, loudly praising him as he does that, and letting him hold and manipulate the toy for a few seconds (lines 34–39). She then announces she is going to hide the bracelet again, takes it from him and holds it up at his eye level before hiding it. The act of hiding the bracelet is also accompanied for its entire duration by utterances in a playful, breathy voice, typical of the expression of amazement or surprise; she keeps the same affective tone in the non-verbal vocalizations she utters while swapping the cloths around (line 48).

The continuous and affectively loaded voicing of the assessors is effective in keeping the child engaged, although by the same token she makes herself more salient. Kevin follows her gestures closely; as she slowly makes the cloth with the bracelet pass in front of him, he rests the fingertips of both hands on it (G. 5a). When she takes her hands off the cloths and addresses the child with the utterance °Where i:(h)s (h)<u>i</u>:t?°, one of his hands is still on the cloth with the bracelet, but he then vocalizes in response and stretches the other arm toward the left where the bracelet had been last seen (G. 5b). At this point he grabs the "wrong" cloth, lifts and inspects it, and extends it toward the assessor with a loud and seemingly expectant "UH::!" (line 51).What follows in conversational terms is akin to a dispreferred second assessment (Pomerantz, 1984): there is a gap after the end of the child's vocalization, then a "Yeah" markedly less loud then her previous one, ending with descending intonation and with no playful vibrancy to it. This low intensity reply, while taking up the child's utterance, withholds praise or acceptance for his act; it

[5]True, the assessor asked verbally to find the bracelet, however the verbal instruction is only accessory to the test, which is supposed to work independently of the language instructions.
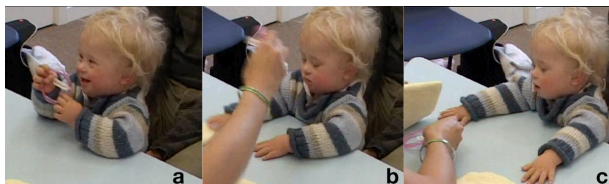
Extract 3 [Figures 4–6]
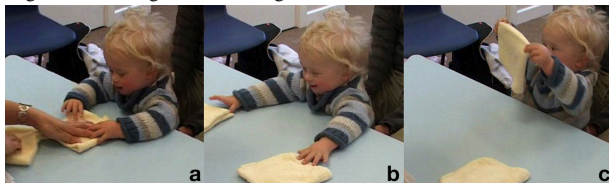

Figure 4(a), Figure 4(b), Figure 4(c).
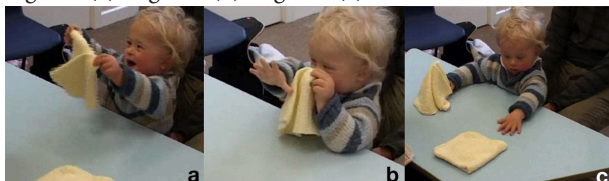

Figure 5(a), Figure 5(b), Figure 5(c).

Figure 6(a), Figure 6(b), Figure 6(c).

34	Assess:	=↑<u>H</u>ere it is! ((*lifts bracelet for K to grasp*))
35		(.2) ((*K takes bracelet*))
36	Assess:	YAE:::::[Y:= ((*clapping*))
37		[((*K smiles*)) **G. 4a**
38	Assess:	=You <u>f</u>ound [it!
39		[((*K looks at her and tighten both fists around the bracelet*))
40	Assess:	<u>V</u>ery clever=['r you watching?
41		[((*A takes bracelet from K's hands*)) **G. 4b**
42	Assess:	.Hh I'm gonna h:ide it <u>ag</u>ain= [you watching?
43		[((*A holds the bracelet up*))
44		.h hu:hh I'm gonna [hide it under <u>he</u>:re,
45		[((*A puts bracelet under left cloth, K looks there*)) **G. 4c**
46	Assess:	[you watching?
47		[((*A puts hands on cloths*))
48	Assess:	.Hs:[s::: oo:oo:::h ((*swaps the cloths*))
49		[((*K puts hands on the bracelet-cloth as it passes in front of him*)) **G. 5a**
50		.hhh °Where i:(h)s (h)<u>i</u>:t?° ((*breathy*))
51	Kevin:	Hu::: ((*reaches for both cloths, arms spread*)) **G. 5b**
52	Assess:	Where is the <u>bra</u>:celet? ((*smile voice*))
53	Kevin:	Ehhh ((*picks up the 'wrong' cloth and lifts it up*)) **G. 5c**
54	Assess:	Oh:h you like the <u>cl</u>oths don't you?
55	Kevin:	UH::! ((*holds cloth up with both hands, moves it toward A, smiling*)) **G. 6a**
56		(.2)

(Continued)

57	Assess:	Yea:h. ((*unenthusiastic*))
58		(1.5)
59	Kevin:	Uhuhuhuh? ((*bow his face to touch the cloth*)) **G. 6b**
60		(6.0) ((*K looks at A, moves the cloth around and shakes it,*
61		*then reaches for the other one*)) **G. 6c**

thus constitute implicit negative modeling by communicating to the child that the cloth is not what the game is about. In the six seconds of silence that follow, the assessor lets Kevin manipulate the cloth, until he drops it down and reaches for the other one. Conversationally, this act is akin to a repair, in which there is an attempt at redressing a previous exchange that had not achieved a positive completion (Schegloff et al., 1977).

While it seems that this time Kevin was more clearly trying to find the bracelet, we can also see that he attempted to pull at the cloth in the course of the swapping: he responded to the assessor sliding the cloth toward him as an invitation to grabbing (line 49), just as she had done with the bracelet at the beginning this trial. In other words, Kevin might not be attending to the activity as a fixed hide-swap-find sequence in which he is supposed to act at the end, but rather as one having multiple entry points for him, in response to each assessor's move.

The task for the child is then to make up the rules as he goes along; the fact that there are rules and this is not free play is indexed by the reactions of the assessor to what he does. Despite, therefore, the Bayley's intent to assess "play skills," the child's performance is geared toward making sense of the assessor's verbal and non-verbal conduct in relation to his actions. The type of play that is set up in the test is not auto-telic, i.e., is not independent from the interactional frame that first encourages the child to engage with the test material and then evaluates his actions or reiterates the task, but it is not "playing together" either, because the child is left alone at the point in which he has to demonstrate his "skill." Each item administration resemble thus in format an instructional sequence (Marlaire and Maynard, 1990), in which a performance enacted upon request (like a school pupil's answering of a teacher's question) is followed by its evaluation, and where withholding of the follow up and/or the reiteration of the question can represent negative feedback.

At the end of the previous sequence, the assessor again commented on the child's lack of success, this time identifying his interest in the cloths as impeding a successful completion of the task (line 54). Before the subsequent trial (**Extract 4**), she does some more facilitating activities, but this time marks out the act of *uncovering* the bracelet from beneath the cloth, rather than the bracelet as such.

The assessor, before starting the trial proper, covers and uncovers the bracelet twice, first producing a continuous inhaling sound, the second time a shorter, louder and more marked aspirated sound, ".HHU!." To this, the child stays still, while keeping the gaze on the cloth (G. 7a). The assessor then lifts the cloth up again, producing sounds, keeps it lifted and slides it forward so to invite Kevin to take hold of the bracelet. As he does it, she utters a loud, high pitch and smiling "YEAH:::!" then continues

Extract 4 [Figures 7 and 8]

Figure 7(a), Figure 7(b), Figure 7(c).

Figure 8(a), Figure 8(b), Figure 8(c).

62	Assess:	((takes cloth [from K's hand)),
63		[>°How about under this one=
64		[=ready?
65		[((K pinches a corner of the cloth with the bracelet))
66	Assess:	[.HHU!
67		[((A lifts the corner up exposing the bracelet, K looks)) **G. 7a**
68		(2.0) ((A covers the bracelet again and looks at K.))
69		((K looks at the cloth without moving))
70	Assess:	°Oh:h[h::: ((lifts the cloth higher))
71	Kevin:	[°Ehh:: °
72		(0.5)
73		° Look.° °there it is.° ((A keeps cloth lifted up and slides the bracelet toward K))
74	Kevin:	Eheeh ((grabs the bracelet)) **G 7b**
75	Assess:	YEAH:::! YOU'VE GO:T IT!
76		((K smiles broadly, grasps the bracelet with fisted hands)) **G. 7c**
77		HA<u>HA</u>:HA! VERY <u>clever</u> ri:ght.
78		(1.8) ((A folds the cloths in four preparing for the next trial))
79	Assess:	[Watchin' agai:n, (.) rea:dy::?
80		[((Reaches over and seizes the bracelet, K keeps its grip)) **G. 8a**
81		I'm gonna hide i:t, ((pulls the bracelet toward her))
82		under [here, you watching?
83		[((taps bracelet on K's hand on the way to hiding it))
84		(1.0) ((A hides bracelet under the right cloth))
85	Assess:	There it goe:s, hah go <u>on</u>.
86		[watchin=watchin=watchin=watchin=watchin,
87		[((A switches positions of the cloths, bracelet goes to left hand side))
88		[((K grab the s edge of the bracelet-cloth and holds it)) **G. 8b**

(Continued)

89	Assess:	.<u>H</u>hhhhu (.) >where is i:t [go:ne?< ((smile voice))
90		[((A takes hand off the cloth))
91	Kevin:	(0.5) ((K pinches then lifts the cloth hiding the bracelet)) **G. 8c**
92	Assess:	[GOOD <u>BO</u>:Y VERY GOO:D=<u>WELL</u> <u>DO</u>:NE that's it.
93		[((K holds the cloth up then puts it aside and takes the bracelet))
94	Assess:	There it i:s?
95		(0.8)
96	Assess:	[VERY GOODH!
97		[((K lifts the bracelet and stares at it))
98		(1.0)
99	Assess:	Ready?=we've got o:ne <u>mo:re</u> to do::, ((low mock voice))

on with more words of praise in the same affective quality (line 77). In stark contrast with the child unresponsive attitude toward the bracelet in the first part of the sequence, the assessor with her reaction retrospectively constructs taking the bracelet as a highly positive and praiseworthy action, which in turn has the child displaying positive affect by smiling to her.

This did not count as success because the bracelet was in sight of Kevin when he took it; the assessor then goes on with the next trial. For the duration of the hiding and moving the cloths she keeps talking to Kevin, and taps the bracelet softly on his hand just before making it disappear under the cloth. The utterances are again delivered with a breathy, smiling voice, and those features become even more prominent when she addresses Kevin the question ".Hhhhu (.) >where is i:t [go:ne?<." The boy, who had kept the tips of his finger on the cloth with the bracelet while it was being swapped, lets go briefly of it just to grasp it with his other hand and lifts it up, finally completing the task. This provokes again a prolonged and loud praise by the assessor. As before, she lets him play with the bracelet for a short time; she then takes it away for the last trial (with the bracelet on the opposite side), which will be successful as well. This last sequence shows what seems a more single-minded approach to the task, which has the child keep track of the bracelet, lift the cloth as soon as it is free and then take the bracelet in his hand. Once, in other words, the expectations of the adult interactant were more transparent to him, he was able to mobilize a strategy to comply with them.

DISCUSSION

The analysis of the administration of the Bayley-III "Find the hidden object" showed two systems at work in the course of the test administration: the conversational organization, visible in the turn-taking exchange between assessor and child, and the play framework, activated by the quality of the assessor's communication and by the presence and use of the toys.

Both Henricks (2006) and Sicart (2014) stress that the experiential value of play is the connection it allows with other

humans and the new possibilities it opens for that connection to be explored; our analysis aligns with those claims by illustrating how, if play is activated by an interactional partner, the relational aspect of the activity is foregrounded; once play is set off, the co-player becomes a source of cues for ways in which playing can develop. We have described the intent gaze of the child on the assessor, and his bit-by-bit reactions to her moves, showing that her conduct was for the child a very prominent component of the situation. We have seen the assessor sustaining the child's engagement by accompanying the physical actions required for the administration of the item with conversational moves with child-directed communication features, as well as play markers, thus investing the objects with interactional significance while inviting the child to act on them.

After the child's initial failure, the assessor relied on the established interactional frame for what we have described as *modeling*, i.e. selecting and marking out through intense positive affect parts of the successful sequence, i.e., first the grabbing of the bracelet then the uncovering of it. The child was seen to orient to those sequels of his actions until he was able to induce the more positive reaction consistently. Apparently, the hidden object to be found in this section of the test was the rule of the game itself, after which the child had enough resources to perform successfully. Without deciphering the verbal of the part communication (the "where is it"? of the assessor), what the child had at his disposal were the paraverbal features, such as intonation, volume and sound play; the assessor increased her use of them throughout the episode until the two of them seemingly reached a state of intersubjectivity about the matter at hand.

Maynard (2005) discusses interactional practices in terms of Gestalt configurations, and argues that, in the disembedded tasks used in tests, "local," more detailed interpretations can prevail for children with difficulties over more "global" ones, which would identify the conventional type of action requested by their interactant. Local forms of interpretations are still rooted in ordinary interactional resources, but less likely to be used in the same context by children with typical development. Kevin thus might have been initially following a local move-countermove pattern, instead of responding to the full structure of the game, and only later, after some support, aligning with the task as proposed by this test item. On the other hand, we may be confronted with a specificity of this child, perhaps linked to Down syndrome, as the inclination to attend to the social component of a situation rather than the physical one, and tune in with the affective rather than semantic level of communication, as research in social skills observed in children with the condition may suggest.

We have also observed how the objects constituting the test item, expected to trigger certain behaviors on the basis of their physical characteristics, did not in fact suggest to the child a unique course of action. The cloths, designed to be neutral tools for hiding the bracelet to sight, were treated by him as having a variety of affordances, and appeared pleasant to manipulate, whereas the bracelet did not generate an immediate interest[6].

We know that the cloths had been introduced to replace the inconveniently heavy cups used in previous versions, and that any objects included or changed in the test were reviewed by panels of experts and pilot-tested (Albers and Grieve, 2007). Still, it may be difficult even for expert adults to predict the preferences of young children, even more so if the children have an atypical psycho-physical set-up. Furthermore, as discussed earlier, it is inherent in the nature of play to embed exploratory activities, and to allow improvised and innovative uses of objects. Children in an assessment situation, therefore, can find themselves involved in an activity that sports familiar features of play as they experience it at home or at the nursery, but where there are stricter constraints to the repertoires of actions that can be tried out. The assessor's behavior orients the child toward a right-or-wrong interpretation of his own actions, thus leaving the realm of play to enter that of instructional activities. This hybridization of activity frameworks might also be in the way of children's grasping the relevant level of response between local and global, as discussed above.

There may be more specific causes of confusion regarding the design of the activity. It has been argued that very young children understand the purpose of directives before being able to interpret what the directive is asking (Reddy, forthcoming). We have seen the child in this study responding regularly with both vocalizations and actions to the assessor's requests to find the bracelet, but without complying with the specific content of the request: if verbal comprehension is not fully present, the verbal part of the item administration may represent just a generic–and misleading–prompt for the child to act. As concerns requests of the "find the hidden object" type specifically, it has been observed that younger typical children, when the act of hiding is accompanied by verbal communication, do more "perseverative search errors"–i.e., searching for an object where it was last seen–than when there is no communication going with it, suggesting a systematic pragmatic misunderstanding of what the talk is doing in relation to the object [7] (Topál et al., 2008, cit. in Csibra and Gergely, 2009). These observations together suggest that the combination of verbal stimuli and object manipulation constituting "play" in assessments may put young and verbally delayed children onto a very different action trajectory compared to children with higher language competences.

In essence, we would like to argue that the way in which "play" unfolded in the interaction developing around the test item diverged substantially from the "play" that was embedded in this test item according to its designers. The assessor's competent direction in cueing the right acts is involuntary testimony to this discrepancy between a definition of play as a scripted manipulation of objects and one in which it is the product of interactional possibilities opened in a shared domain of action.

An obvious point is that the failure of a child to perform the required behavior cannot be unambiguously attributed

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[6]Shukla (2010) reports that it was common for the children she observed to show interest in the cloths during 'Find the hidden object.

[7]Csibra and Gergely (2009:152) argue that the child could see "the experimenter's hiding actions as a communicative demonstration of some generalizable information (e.g. that container A is 'for' storing the kind of objects being hidden) rather than an interactive hiding–finding game."

to a deficit of the relative cognitive skills, and that the narrow range of actions allowed by the test, their imposed repetition, and the quick succession of different trials throughout the test are likely to trigger behavioral heuristics aimed at cutting down the task's repetition or conquering most praise. However, it is not our intention to undermine the Bayley III or psychological assessments in general[8]. Our interest lies in showing that extricating a child's performance from the bundles of interactional events happening in the course of a test administration can only be done by disciplinary practices with the power to retain selected features of a situation and erase the conditions of their coming into being. Such practices, that Foucault (1975) saw as the exertion of disciplinary authority, and that ethnomethodologists since Garfinkel (1967) have been out to discover (Housley and Fitzgerald, 2006) have the power to create "second nature," (Gramsci, 1971; Pizza, 2012), namely to represent socially produced human traits and qualities as originated by natural causes. Societal and clinical understanding of conditions such as the Down syndrome are largely constituted via specialized instruments, like the Bayley-III, that set definitions and boundaries of adequate performance, limiting the knowledge that can derive from letting diversity have its way.

CONCLUSIONS

The study illustrated that play in assessment loses some of the core features of play, such as free exploration and novel uses of objects, and instead, being structured as small single tasks ending with implicit or explicit evaluations, borders with verification-type instructional activities. The range of play skills the assessment aims at measuring is therefore limited to a diminutive version of "play."

The study also suggests that a better understanding of the way verbal communication and object manipulation combine during the administration of test items could be beneficial in the design and evaluation of tasks: assessments designed to be language-free but which nonetheless involve language as a support to engagement can become very different entities from what the test designer might have envisioned. In such cases, it is not standardization that would help determine what skills come into play, but rather the systematic microanalysis of actual episodes of test administrations, in order to reconstruct the sense-making procedures occurring between the interactants in relation to the tasks.

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[8]As for the Bayley III in particular, there are indications that, in correcting bias identified for the previous versions, it may now in fact overestimate children's capabilities (Johnson et al., 2014).

As concerns the choices made in this study, while focusing on a single episode was instrumental to follow closely the trajectory from failure to success, and unpick the moment- by-moment procedures supporting mutual understanding, it could have also been informative to examine the whole assessment and explore the types of interactional trajectories set out by different types of tasks. A promising path of investigation would be to follow the same children at home and in different institutional settings, for a more robust interpretation of the kind of resources a child is drawing from, and to ascertain whether the competences developed in familiar settings are transferred across when children find themselves in testing situations.

ETHICS STATEMENT

AUTHOR CONTRIBUTIONS

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APPENDIX

Transcription Symbols

The transcription used in this paper is the standard for Conversation Analysis and is based on Jefferson (2004a).

Mea::t	Colon(s): Extended or stretched sound.
<u>Fresh</u>	Underline: Emphasis.
(.)	Micropause, pause of less than (0.2).
(1.2)	Timed Pause: Intervals occurring within and between same or different speaker's utterances in tenths of seconds.
(())	Double Parentheses: Contextual information.
() (we're)	Single Parentheses: non hearable speech (empty) or uncertain interpretation (with words)
Yeah.	Period: Falling vocal pitch.
Yeah?	Question mark: Rising vocal pitch.
Yeah!	Exclamation mark: animated tone.
HE DID	Caps: Marked loudness compared to surrounding talk.
[	Square bracket: Marks the beginning point at which current talk is overlapped by another speaker's talk.
[	Bracket in italics mark simultaneous onset of movements or gestures with talk of same or other speaker
↓↑	Pitch resets; marked rising and falling shifts in intonation.
=	Latching of contiguous utterances, fast succession of the spates of talk united by =
°Well	A passage of talk noticeably softer than surrounding talk.
> <, < >	Less Than/Greater Than Signs: Portions of an utterance delivered at a pace noticeably quicker (> <) or slower than surrounding talk.
But-	Hyphen: Halting, abrupt cut off of sound or word.
.hhh	Single or multiple 'h' letter preceded by dot: audible inbreaths.
h (h)	Single or multiple 'h' letter alone or in brackets: audible stand alone outbreaths, sighing; within words: breath emission through (like laughter or pfh-ing).

Check for updates

Change during Psychotherapy through Sand Play Tray in Children That Have Been Sexually Abused

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This paper presents the results of a qualitative study on the use of sandplay, or sand tray therapy, in the psychotherapeutic process of children who have been sexually abused. A longitudinal study was carried out with seven participants between the ages of 7 and 10 years old. Data was produced during observation of the therapeutic activity over the course of three different phases of treatment, using a rubric created especially for this observation. Three sandplay sessions were recorded: one at the start of therapy, one at the 3-month mark, and the third and final session after 6 months of treatment. Sessions were then transcribed for later analysis. A rubric was developed in order to help researchers identify central themes, behaviors and content of creative play, as well as the therapeutic relationship. Transcribed sessions and observation rubrics were evaluated using qualitative content analysis, and information was categorized according to verbal and behavioral characteristics of the game. Results of the present study reveal common and transversal forms of playful expression among this group of children shown by their engagement with sandplay. During this activity, participants elaborate personal stories that feature violence as a central theme, often involving aggression between two or more individuals. They also express their need for care and protection and work to resolve conflicts using fantasy. The shifting dynamics of sandplay at each stage of therapeutic treatment is an important finding that reveals the progress made during psychotherapy. In the third phase of treatment, sandplay encouraged movement among children, allowing them to act out meaningful scenarios and create structured situations with positive outcomes. Finally, the value of sandplay as an important therapeutic tool is discussed, primarily its role in supporting processes of change and allowing participants to assign new meanings to traumatic experiences. Its application to the field of clinical psychology, particularly when working with victims of sexual abuse, is also explored.

Keywords: psychotherapy, sexual abuse, children, play, sandplay

INTRODUCTION

Child sexual assault is a serious issue which has drawn increasing international attention in recent years. Studies show that nearly 150 million girls and 73 million boys under 18 years have experienced sexual abuse (United Nations Children's Fund [UNICEF], 2006). In Chile, studies show that around 7% of boys and girls between 11 and 17 years old have suffered from sexual abuse at some point in their lives (Ministerio del Interior [Home Office], 2013). These statistics have prompted debates from diverse sectors of society on how to best analyze and strengthen legislation toward eradicating child abuse.

Many different authors from across the world have argued that sexual assault may profoundly impact the life of a child by interfering with their psychological functioning and development (Echeburúa and Corral, 2006; Cutajar et al., 2010). Thus, one of the most widely used models applied to cases of sexual assault and their consequences, proposed by Finkelhor and Browne (1985), posits four specific traumagenic dynamics: powerlessness, betrayal, stigmatization, and traumatic sexualization. Given the severity and consequences of sexual assault, it is essential that child victims of abuse receive prompt treatment (Centro de Asistencia a Víctimas de Atentados Sexuales [CAVAS], 2011). Specialized treatment options have been proposed in order to address the complexity of this problem. An eco-systemic approach, for example, brings together different therapeutic actions aimed at reestablishing overall functioning of children, allowing them to elaborate the traumatic experience (Gómez et al., 2010; Centro de Asistencia a Víctimas de Atentados Sexuales [CAVAS], 2011), being this kind of psychotherapy one of the ways of treatment.

In psychotherapy with children who have been sexually assaulted, therapeutic approaches must constantly adapt and adjust to the patient's own rhythm—incorporating and reaffirming his or her needs while also adhering to the goals of treatment (Cattanach, 2004). Inside this, play is regarded as a key therapeutic activity for children because it stimulates communication and the symbolization of lived experiences using non-verbal methods of expression. This is especially important when working with victims of sexual assault who may find it difficult to speak about their experiences (Gil, 2006; Esquivel y Ancona et al., 2007). Play also supports general development and creativity in children (West, 2000; Cattanach, 2004); it provides a safe and protected space where children may experiment with different ways of acting and understanding the world and articulate and integrate traumatic experiences (West, 2000; Oaklander, 2001).

Symbolic play is a form of expression in which the comprehension of self and reality are transformed using symbolic language (Piaget and Inhendler, 2000), enabling children to return to past experiences and take control over them (Piaget, 2010). In this way, a child may act out traumatic experiences using repetition compulsion of an event in order to assimilate their experience—referred to as post-traumatic play (Gil, 2006). Aspects of trauma are acted out in a more direct and less imaginative way than in typical child's play, and involve the repetition of a specific troubling outcome (Terr, 1990). Nonetheless, as children take control over how they relive a traumatic experience in a safe and contained environment they may then externalize the event, moving from passive receptor to active agent (Ogawa, 2004). As a result, they are able to develop their own account of the experience and create new meaning (Freeman et al., 1997).

Sand tray therapy, a symbolic mode of play, is commonly applied within clinical settings. Here, children use a sand tray to create their own fantasy worlds. Through the use of different figurines (miniature animals, people and plants, among other items), children depict their understanding of the world and aspects of their reality (Amman, 1991; Dale and Lyddon, 2000), providing the clinician with a symbolic representation of their inner world (Cunningham and Macfarlane, 1996). This playful approach provides children with a contained and protected space for where they may share facets of their experience (Labovitz and Goodwin, 2000).

During the sandplay it is important to pay attention to both behaviors as well as the content of the game, which provides a deeper understanding of the activity for further analysis an therapeutic use. Such observations may include how children handle sand, the number of miniatures utilized, the ways in which children engage in play, as well as any changes or revisions made to the game. Content refers to emerging themes played out in the fantasy world and any connections between them (Sjolund and Schaefer, 1994).

In this way, a number of authors have shown the benefits of sand tray therapy, or sandplay, in young patients' progress during psychotherapeutic treatment (O'Connor and Schaefer, 1994; Oaklander, 2001). In particular, research on the use of sandplay with child victims of sexual assault (Grubbs, 1994; Dripchak, 2007) reveals that by using sandplay children may externalize conflict and take control over negative experiences, opening the possibility to portray, manipulate, alter and destroy facets of the traumatic experience. These are all crucial to psychotherapeutic work in the sense that they allow individuals to resignify events (Labovitz and Goodwin, 2000).

On the other hand's the effectiveness of different forms of play therapy for child victims of sexual abuse has been studied (Hetzel-Riggin et al., 2007; Sanchez-Meca et al., 2011). Nonetheless, research often fails to describe the characteristics of these activities during different stages of treatment (Mathis, 2001). Moreover, despite a surge in international research on the use of play during therapy (Harper, 1991; Zinni, 1997; Homeyer and Landreth, 1998), researchers often comparing play in children to other clinical samples or control groups, allowing the analysis of differential indicators, such as sexuality, safety, and care, that emerge in play. Despite the relevance of these research findings, indicators are isolated from the larger context of psychotherapy, in which sand tray therapy is limited to evaluating a specific moment of the therapeutic process.

Few studies employ methodologies that allow for a deeper analysis of aspects of play therapy and their progression over the course of psychotherapy (Mathis, 2001; Herane, 2005). In one case, Mathis (2001) analyzes the progression of sand tray therapy among children during 10 months of treatment. Results show a positive change in how children engage in sand play.

Considering all these, limited research on the topic of therapeutic treatment with victims of sexual assault, particularly play therapy and children, demonstrates the need for further qualitative studies concerned with the subjectivity of participants involved in treatment. The present study therefore seeks to analyze characteristics of play during therapy among child victims of sexual assault between the ages of 7 and 10. Three particular moments of the therapeutic process are observed using sand tray therapy.

METHODOLOGY

Sample

The research sample consists of children between 7 and 10 years old. Participants were selected using inclusion criteria of both girls and boys who have suffered from sexual abuse and who, at the time of study, were enrolled in psychotherapeutic treatment in a specialized center for the treatment of child sexual assault. The sample was obtained at the Center for the Treatment of Sexual Abuse (CAVAS), an organization affiliated with the Policía de Investigaciones de Chile (Civil Police Department) which serves child victims of sexual assault in the city of Santiago, Chile.

In order to obtain and establish the sample, authorization was secured by the Institute of Criminology which oversees CAVAS, specifically by the project team coordinator which provided researchers with access to clinical records of the children who agreed to participate in the study.

Therapists were asked to present the option of participating in the study to patients and their legal guardians. They were then informed of the research study, as well as ethical implications of participating voluntarily and anonymously. After agreeing to participate, the parents or legal guardians were asked to sign an informed consent form, and children's verbal assent was obtained by the therapist once they confirmed their desire to participate. The total number of participants was determined using the criterion of data saturation (Rodríguez et al., 1999), which considers participants until all information has been sufficiently collected. Cases of sexual abuse among the sample population were either extra- or intrafamilial and differ in terms of incidence and duration, particularly in terms of chronic and repeated exposure. This criteria is consistent with literature on sexual assault and the cases share similar characteristics (Finkelhor, 1994; Cantón and Cortés, 2004; Pereda et al., 2009). In addition, differential criteria were included, specifically regarding gender and participants with varied symptomatology. It is important to note that cases involving serious psychological disorders, such as psychosis and organicity, were omitted from the sample. Accordingly, the primary characteristics of the sample population are presented in **Table 1**.

All children participating in the study had completed psychodiagnostic phase, which identifies clinical indicators of sexual abuse prior to starting treatment, and were in the beginning stages of psychotherapy. Participants attended sessions on a regular basis and, according to information reported by therapists for each case, children had no contact with the perpetrators.

With regards to the treatment method, sand tray therapy was used prior to the study in order to familiarize participants with the activity, but wasn't the only technique used in therapy. It is important to note that the type of sand tray and miniatures utilized in the present study are consistent with the technical references established by specialists (Cunningham and Macfarlane, 1996; Gil, 2006).

On the other hand, about the sample of therapists, one selection criteria in the present study was that therapist uses implementation of a constructivist approach to psychotherapy. Therapists were also expected to have had previous experience or

TABLE 1 | Sample characteristics.

Characteristics	Category	Number
Gender	Girl	5
	Boy	2
Relation to perpetrator	Paternal figure (father, stepfather)	2
	Other family member (brother, grandfather, uncle, great uncle)	3
	Acquaintance (family friend, other)	2
Type of aggression	Sexual abuse	3
	Rape	4
Incidence	Repeated	5
	Chronic	2
Primary symptomatology (could be more than one)	Depressive	5
	Anxious	7
	Behavioral	4
	Somatic	2

prior training with sand tray therapy in a clinical setting. This was important for standardizing the application of techniques and interventions employed in the study. Finally, a total of six psychologists participated in the study, all of whom took part in a theoretical and practical training course on standardizing criteria related to the application and engagement with sand tray therapy.

It is relevant to note that the present study was an investigation carried out in the context of a Master of Clinical Psychology Program at the University of Chile (Tornero, 2014). Thus, the ethical aspects of this research, along with other aspects, was fully assessed, reviewed, and approved by a specialized review committee at this Program, which uses guidelines of the Ethics Committee for the Investigation in Social Sciences and Humanities of the University of Chile.

Techniques

One of the main methods for collecting qualitative data was observation. This involves the detailed and systematic description of behaviors, artifacts, and events in the social setting under study (Marshall and Rossman, 1989; Banister et al., 2004) in order to record both verbal and non-verbal behaviors of the subject in his or her specific context (Banister et al., 2004). Observation, when paired with play therapy, provides insight into this phenomenon because it looks specifically at narrative and behavioral components of creative play. This is consistent with the key objectives of the present study.

Observation is beneficial in cases where subjects have difficulty expressing themselves verbally and emotionally, thereby allowing researchers to access a variety of topics, unlike other techniques (Rodríguez et al., 1999). It is a minimally invasive method of study for this specific sample population, which requires an approach that is attentive to the psychological impact of sexual assault and protects the psychosocial well-being of participants.

Moreover, this technique draws on recording methods that help to structure and guide the process and specify the content and length of time under observation (Banister et al., 2004).

In the present study, observation was structured using two primary methods: video recordings and an observation rubric or assessment.

Prior to beginning, a rubric was developed in order to provide a framework with which to observe and evaluate behaviors, content of the activity and the therapeutic relationship. A theoretical review of the literature on sand tray therapy was conducted and relevant aspects of the activity and the relationship between therapist and patient were identified and systematized in the rubric. Behaviors and content of sandplay served as a primary focus for understanding the various activities and narratives developed during the activity. With regards to the therapeutic relationship, verbal and non-verbal interactions, as well as displays of emotion and exchanges between patient and therapist, were considered. This was a way to essentially grasp the relational context within which sandplay was developed, providing an additional perspective in order to advance understanding of this therapeutic tool. Within each of these three aspects (content, behavior, and relationship), more precise aspects of observation were identified. Nonetheless, for the purpose of this article, only behaviors and content of sandplay are explored.

It is important to note that the observation rubric was reviewed by a professional psychologist specialized in psychotherapy with child victims of sexual abuse, and all suggestions were incorporated. Similarly, the rubric was applied to a pilot case independent of this study, allowing researchers to make changes prior to implementation. This rubric has the objective of guiding observation (for example, to observe use of sand, story development, etc.) and not to code behaviors.

In the second phase of study, therapeutic sessions for seven children receiving treatment at CAVAS were videotaped. Video recordings are essential for analyzing the actions and interactions of participants, and they allow researchers to observe a situation more than once (Secrist et al., 2002). Moreover, a photo digital camera was used to obtain a visual image of the sand tray and the final product. Images are not analyzed in the present study, however, they are used as an example.

To adhere to the normal course of treatment for ethical reasons, children's own therapists were therefore responsible for introducing the activity into their therapeutic sessions. Therapists presented each child with material components of the play and then provided them with the following instructions (based on guidelines by O'Connor and Schaefer, 1994; Homeyer and Sweeney, 2011): "Create your own world or story in the sand, exactly how you would like to, using the miniatures provided. Once you have finished, we will take a picture of the sand tray." The materials used were a plastic container. According to the guidelines provided by authors such as Mathis (2001), they were ideally, blue so that when sand is shifted within the box it gives the impression of water or the sky (Mathis, 2001). Moreover, the recommended size of the box was used, which is 46 cm × 69 cm with a 5 cm border allowing for easy observation of the activity (Lowenfeld, 1979; Oaklander, 2001).

Video Recordings were taken at three different points in time during the psychotherapeutic process: in the beginning, after 3 months of treatment and finally, after 6 months of treatment. This allowed for a span of six to nine regular sessions between each activity, which complied with long-term treatment goals while also minimizing the number of sessions between recordings. The timeline was implemented at the start of treatment, as clinical manifestations of the activity in the beginning stages of treatment were shown to provide key information on the progression and psycho-affective state of each child. At the same time, the activity was recorded during the initial session and in two other points of treatment in order to gauge the activity's progression (see **Table 2**).

It should be noted that during the research process, some cases withdrawn from the study. As a result, there are seven recordings from the first phase, seven from the second and five from the third and final phase.

Recordings were scheduled together with the therapist, informing to the child and legal guardians of this prior to the session. Practice recordings were performed in order to ensure proper positioning of the camera without interfering with the session. In between recordings, participant's progress (attendance and general emotional state) was monitored by the therapist as to determine the best time to schedule a future video recording of the sandplay session. In this way, the researcher was able to access relevant information about the therapeutic process and the child's own history, and to gain a deeper understanding of the particular case.

Therapeutic sessions were approximately 50 min long, and the duration of the activity itself ranged anywhere from a fraction of the time allotted to the full session. Recordings were taken of the entire session, regardless of the time spent on the activity, in order to ensure the normal order of the psychotherapeutic session. The sand tray was photographed prior to disassembly. Finally, observations were made by researchers using recordings of therapeutic sessions, the transcription of the videos and the observation rubric. All steps of the process were repeated for each phase.

Analysis

Data gathered through observation was analyzed using qualitative content analysis, one research method concerned with subjective interpretation. This is important given the present study's focus on play as a form of expression among children. Content analysis is used for textual material produced by a number of data gathering methods, thereby allowing the researcher to access content of any communicative act. It also outlines a set of procedures for organizing both verbal and behavioral information (Abela, 1998; Pérez Serrano, 1998).

Content analysis was employed using guidelines proposed by Strauss and Corbin (1990). This method involves selecting relevant parts of a text and identifying primary units of meaning which are related to phenomena under study. These units of meaning are then qualitatively coded and categorized using specific criteria (shared characteristics and meanings) in order to later develop an interpretive understanding of data, making comparisons of theoretical information while further developing the research question (Strauss and Corbin, 1990; Hernández et al., 2006).

TABLE 2 | Timeline of video recordings.

Participant	Sex	Age	Number of recordings during the initial phase	Number of sessions from beginning to month 3 of treatment	Number of recordings at month 3 of treatment	Number of sessions in months 3–6 of treatment	Number of recordings at month 6 of treatment
M	F	10	1	6	1	6	1
I	F	8	1	8	1	7	1
J	F	9	1	7	1	8	1
F	F	8	1	8	1	–	0
W	F	7	1	8	1	8	1
V	M	8	1	6	1	7	1
B	M	8	1	9	1	–	0

In the present study, videos and their transcriptions were observed using the rubric. Given the variety of data sources in terms of both digital and analog language, it was key to develop a form of qualitative coding which would allow the research to carry out a detailed analysis and consistently work with information in order to clarify observations. Coding was done identifying portions of the text, that were selected and grouped according to thematic criteria presented in the rubric (for example, identifying feelings in the play, which were of anger, fear, etc.). These were directly related to the objectives of the present study, and some were eventually designated as categories.

In the second stage, a cross-sectional analysis was carried out for each phase of sand tray therapy. Results led to the development of a conceptual map for interpreting content, and a document, or memo, was developed for each of the phases. In the third and final stage, and once the conceptual map was created for phase, characteristics of categories present in the transcriptions were examined and compared. Categories were evaluated and reformulated based on emerging meanings in order to identify similarities and differences between phases. It is important to note that two researchers were involved in reviewing recordings and defining categories, using intersubjectivity in order to verify observations and analysis, presenting generally, important similarities in the analysis. Thus, the triangulation of data analysis among researchers was a significant criteria of rigor in this study.

RESULTS

Results are organized according to the behaviors and content of sandplay observed in psychotherapeutic sessions. In the first section of each content or behavior, commonly observed aspects which appear at different phases of treatment are presented. Differences between the three phases are then identified. Main results are shown in **Tables 3**, **4**. Excerpts from video recordings as well as photographs of the sand tray help to illustrate aspects described in the categories of analysis and provide concrete examples of elements described in the paper, while respecting the confidentiality of all participants at all times.[1]

Play Behavior
Use of Sand
Sand plays an important role in all three phases of treatment, particularly in the development of a story's setting. Four characteristic behaviors were observed among participants: shaping, pouring, burying or hiding, and digging.

Participants initially shape sand in order to even out the surface of the sand tray, which they can then use to construct elements resembling their natural environment or structures, such as mounds or hills. The act of pouring sand is primarily a sensory activity (especially in children with risk-taking behaviors), and registers different levels of intensity depending on whether sand is moved with force or lightly sprinkled. Participants may bury objects or parts of the body (hands or fingers) partially or completely only to later reveal them. Finally, digging in the sand allows participants to create small furrows in the sand with their hands or objects, which serve as waterways (lagoons, rivers, the ocean), hiding or storage places or spaces to bury fallen soldiers.

During the more advanced phases of treatment, changes in behavior include prolonged contact with objects, which grows in intensity when participants expresses sadness over one aspect of game. This may manifest, for example, in an altercation between two people within the game who threaten or hurt each other or exhibit distress.

Categories Employed in the Activity
In order to create their own worlds out of sand, participants drew on human miniatures, fantasy characters and animals of different sizes and species with varied identities, abilities, and duties. Moreover, one important observation was the repeated use of certain categories in all three phases of treatment.

Humans employed in the activity were often family members (grandparents, men, women, teenagers, and young children), public servants (police) and service members (soldiers, warriors, or fighters). Fantasy characters were mostly male and rarely female. While heterogeneous in form, fantasy characters generally possessed special powers and were engaged in fighting. In particular, superheroes and magicians had a dominating presence and were able to exercise control over others.

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[1]In the excepts presented here, "N" is used to identify the child or participant's response, while "T" is used for the therapist's response. Hyphens signal observations or clarifications to the text. Finally, at the end of the excerpt, a series

of letters is used to identify the participant, which corresponds to the participants identification presented in **Table 2**. Videos are marked "V" and are followed by a number (1, 2, and 3) depending on the phase of treatment.

TABLE 3 | Main results of play behavior.

Aspects of sandplay	Play Behavior		
	Phase 1: Beginning of treatment	**Phase 2: After 3 months of treatment**	**Phase 3: After 6 months of treatment**
Use of sand	Sustained contact with the sand: Sensorial activity/Anxious when explaining conflicts. Behavioral characteristics: Shaping-pouring-burying-digging. Sand plays an important role in creating the backdrop of the story.		Sustained contact with the sand, which intensifies when child is in distress.
Categories employed in the activity	People: Family members, police, soldiers and/or warriors. Fantasy characters: Superheroes, bad guys, ghosts, and monsters. Animals: wild and domesticated	Similar to those found in phase 1. Gradual inclusion of reptiles, especially snakes, who appear to be menacing and dangerous.	
Characteristics of the activity	Prevalence of symbolic play Predominance of rigid play	Symbolic play Predominance of mobile play	
Use of time	Predominantly spent building the fantasy world, followed by story development. Delays and interruptions associated with content of the game.		Sporadic interruptions during the game.
Composition	Two major types: Meaningful and consistent scenarios; Increasingly chaotic and disorganized.		Worlds that are predominantly composed in a meaningful and coherent manner.

With regards to the use of animals, participants employed both wild and domestic creatures in families, with each individual carrying out a particular function. From the second phase onward, many participants began to employ reptiles, particularly snakes—a threatening and dangerous element of the game. In the same vein, the incorporation of mythological creatures such as dragons, which play a prominent role in participants' stories, is suggestive as they represent both power and evil.

Characteristics of the Activity

Generally, throughout the treatment process, participants developed a symbolic game involving complex story lines that integrate aspects of reality and fantasy. Here, there are two primary modes of playing. The first involves selecting and arranging figures within the sand tray until a scene is completed. These figures remain in a fixed position throughout the game (see **Figure 1**).

The second mode involves movement or action, whereby the development of a story line is coupled with movements. Here, scenes are active and accompanied by speech, emotional responses, and sounds (see **Figure 2**).

In the initial phase of treatment, participants demonstrated stagnant play, whereby objects are arranged in a static manner despite changes in the story. This contrasts with the later stages of treatment, which were dominated by dynamic play, whereby miniatures and their respective personalities interact with each other and move in different directions, even extending beyond the limits of the sand tray with the development of the story.

Use of Time

Participants dedicated a majority of their time to constructing physical aspects of the play world and then spent the remaining time developing a storyline. These moments were clearly demarcated and communicated to the therapists. In addition, the presence of delays or interruptions is one important aspect of sandplay and was a central component observed among participants in this study. This is associated with a number of interrelated factors, such as content of the game and moments of introspection in response to therapeutic interventions.

Interruptions during play were common and particularly recurrent in the first two phases of treatment, while in the third phase, interruptions were more sporadic. The following excerpt shows the relationship between a desire to pause the game and one's own biological functions. Here, the child expresses her need to use the restroom and physically remove herself from the space. This may be related to emerging feelings of anxiety based on the progression of the game: The child turns toward the box, searching for new objects and says: N: "I have to go to the bathroom" –using a quiet voice (V−V1).

Composition

With regards to the composition of the sand tray, participants organized their worlds in two ways: first, developing meaningful and consistent scenarios where miniatures and other elements in the sand tray are directly implicated in the child's story and second, progressively creating a scenario that becomes more chaotic, disorganized and filled with toys. In the second case, stories began to lose their logical sequence, making them difficult to understand. This is shown by the following excerpt, or observation of this type of disorganization:

T: "Ok, what is the story of this world you've created?" N: "it has to do with, um, with a birthday" N: "both of their birthdays" – she takes up the princess and moves its closer to the prince, then turns to face the sand tray N: "Ah!" – she says, taking the duck out of the sand and quickly placing it on the edge of the sandbox, which represents the ocean – N: "the duck was leaving, I don't know" (W−V3).

TABLE 4 | Main results of play content.

Aspects of sandplay	Play content		
	Phase 1: Beginning of treatment	Phase 2: After 3 months of treatment	Phase 3: After 6 months of treatment
Emerging topics	Violence	Violence	Changes in central themes of participants' stories: Reduced widespread violence, which becomes more specific to certain interactions or behaviors. External support when encountering physical danger.
Character identity	Central focus: good and evil; good characters protect and provide support to others when faced with dangerous situations or aggressors, providing direct assistance; bad characters: unlawful behaviors.		
Surroundings and environment	Hostile and dangerous: threatening and/or threats to public order, between animals, humans or natural disasters, which put all characters at risk.		More organized and less destructive. Presence of safe zones where characters may seek refuge and access personal resources.
Needs	Need for protection and care from threats in one's immediate environment.		Needs are generally met as a result of one's own personal resources or the actions of others.
Feelings and emotional atmosphere	Predominantly marked by fear, which all characters experience in specific contexts or interactions.	Predominantly marked by fear, which all characters experience in specific contexts and interactions; however, progressive inclusion of positive feelings (affection, hapiness, trust).	
Traumagenic dynamics	Predominantly marked by feelings of defenselessness and fear associated with not having control over harmful external events.	Predominantly marked by feelings of defenselessness and fear associated with not having control over harmful external events. Also other dynamics are present: betrayal, traumatic sexualization and stigmatization.	
Story development	Imaginative outcomes with atypical and eccentric or ambiguous features.		Predominantly happy endings, where threats are brought under control and protagonists find a safe space.

In contrast, phase three of treatment is generally marked by more composed scenarios and coherent and meaningful worlds.

Content
Emerging Topics

Among the many topics that emerged during sandplay, violence served as a key organizing theme. Here, content related to experiences of victimization referred to both individuals and groups of people who act in ways that cause physical, psychological, and social harm. Violence in its various forms serves as a guide for the stories that participants develop throughout the course of treatment, whether it be widespread or an individual act that threatens the welfare of others.

During these scenes of aggression, the position of victim and perpetrator are clearly defined, sometimes shifting as the child's story develops. The perpetrator appears as a powerful and all-knowing figure who uses a variety of strategies in order to subdue the victim, using trust as a manipulation tactic, as well as physical harm, deceit, and persecution. The victim, however, suffers from physical harm by others, feeling defenseless and fearful as a result.

With regards to the wide range of negative interactions observed during sandplay, participants referred to three specific types of asymmetrical relationships: aggressive, abuse, and degrading. These relationships are interrelated and marked by an attack on part of the perpetrator, who employs both verbal

and physical violence such as killing, hitting, and biting. This is demonstrated in **Figure 3**, where one participant develops a scenario in which an aggressor (characterized as a spider) kills a man by the venom of its bite.

During play sessions, participants' stories often allude to serious offenses toward female figures or between male figures and others who are typically the most vulnerable due to their size, gender (men–women), stage of development (children–adults) and category (animals–humans). For example, the following excerpt provides insight into the aggressive interaction between a father and his daughter, involving both physical and psychological violence: N: "And she started to cry" T: "mmm" N: "honey, don't cry" –sound of hitting N: "don't cry" – another hit – N: "don't cry, he was hitting her" T: "And why?" N: "because he didn't want her to cry (…) you're stupid" – sounds of fighting (F−V2).

The third phase of treatment shows marked changes in the ways in which violence is presented, mainly the shift from widespread violence to particular violent interactions or behaviors. In some cases, miniatures that were previously used to attack or defend against others do not engage in violence. In addition, stories feature more positive interactions involving collaboration, care and safety. These are often intended to protect characters from violence or to provide support to characters that have been hurt.

FIGURE 1 | Example of rigid play (I−V2).

FIGURE 2 | Example of mobile play (W−V2).

FIGURE 3 | Example of violence in play (V−V1).

Additional emerging themes in participants' stories include threatening environments (hostile and dangerous surroundings), safety measures (to defend against threats or danger), social control (authority and public order), transformation (characters that shift from bad to good or that die and are reborn), family (dynamics and social roles) and nourishment (feeling full or hungry).

Character Identity

In general, throughout all phases of treatment, participants' stories involve plot lines where evil and good are central to identifying characters in the game. On the one hand, "good" individuals are characterized by their ability to protect and provide aid to others in the face of aggressors or dangerous situations. For example, a policeman reports and imprisons those who commit crimes. On the other hand, "bad" individuals are identified by their unlawful behaviors and violent actions toward others, such as physical attacks, theft, destruction of property and harassment.

Environmental Conditions and Personal Needs

Environmental conditions present in the participants' stories are typically dangerous and hostile, and involve various forms of threat and aggression on part of animals, humans, and natural disasters. In particular, tornados and tsunamis appear to create chaos and destruction, resulting in death and material losses and negatively impacting the community. The following excerpt provides an example of the destruction and fatalities caused by a natural disaster: N: "I am searching for survivors!" T: Survivors from what? "N: The tsunami" T: Ahh N: Instead of water there was only sand and all the sand swelled up" T: And the monkeys that were there (...) N: "buried" (V−V3).

In the third phase of treatment, stories draw on environmental conditions that while still threatening and harmful, are noticeably more organized and less destructive than in previous phases. In addition, there is the presence of safe zones, where characters may take shelter or access personal resources that allow them to continue on with their life.

With regards to personal needs, children refer to a lack of protection and care in their stories and draw on feelings of insecurity in the wake of environmental disaster. Here, individuals within their immediate circle (family or friends), as well as law enforcement, play an important role. Moreover, during the third phase of treatment, children's stories involve characters whose needs are met either by themselves or by others. For example, a character's need for protection is met with a safe space to stay, or a character is rescued from danger.

Feelings and Emotional Atmosphere

Participants' stories developed through sandplay at different stages of the therapeutic process are dominated by feelings of fear. Here, characters experience fear when they come into contact with external, hurtful events that are out of their control. As a result, the characters develop a number of psycho-affective and physical responses which vary, even including loss of consciousness and fainting:

N: "she got scared because a girl was walking by with her grandmother" T: "and what happened with the girl and her grandmother?" N: "they fainted" T: they fainted! N: "yes, because the car drove by really fast" T: "mmm, so they got scared." N: "Yes" (I–V2).

Furthermore, feelings that emerge while playing include anger, confusion, sadness, self-reproach, shame, loneliness, hopelessness, and anxiety, all of which refer to catastrophic thinking. Physical feelings of illness and pain related to bodily injury are also present. With the progression of therapeutic treatment, participants' stories involve more circumscribed, positive feelings associated with particular interactions, most notably affection, happiness and trust, which are grounded by an emotional connection to their environment.

In terms of the consequences of sexual assault, or traumagenic dynamics articulated by Finkelhor and Browne (1985), feelings of defenselessness and fear are present in participants' stories. These are often associated with a lack of control over harmful external events. In some cases, characters in the story struggle to remain safe and protected. Despite their search to find a place to hide, threats from their immediate environment are overwhelming: T: "some are trying to steal, others want to raze the building" N: Over there, the girls are hiding (...) N: "There are bad people everywhere" (V–V2).

On the one hand, betrayal appears as a theme in the first and second phases of treatment. Participants' stories speak to a feeling of mistrust between individuals, which is characterized by low credibility, hostility and aggression and which acts as survival mechanisms (fight or flight) in their interactions.

On the other hand, traumatic sexualization is observed in phases two and three of treatment in some participants' stories. This involves an eroticized interpersonal relationship between figures of the same or opposite sex. Some children who suffered from sexual assault at the hands of someone in their immediate family acted out abusive and humiliating moments between characters. In these cases, individuals were treated as commodities or objects to be exchanged and were seduced (particularly through gift-giving) by another individual. This is reflected in the following excerpt:

N: "I'll give you my little duck from ule if you dance with me" T: (laughs) "but you already told him that you would go to the dance with him" N: (laughs) "I'll give you, I'll give you to my girl cousin" T: "How are you going to give me to your cousin?" N: "I'll give you to her" T: "You can't give me to another person" N: "I'll give you to, I'll give you to my boy cousin" (W—V2).

In phase one, stigmatization is present only in the cases of children who have suffered from sexual assault committed by individuals outside of the family (acquaintances). Throughout the course of therapy, however, an increasing number of participants (the majority of children) allude to stigma in their stories in phases two and three. Contents of the play session include characters that are isolated and have feelings of inadequacy, shame, and social exclusion. For example, one child says N: "it feels bad because it's different from all the other animals" (M—V1).

FIGURE 4 | Example of fantasy in stories (F—V2).

Story Development

In the majority of cases, participants create a fantasy world with atypical and eccentric features. Accompanying stories are often ambiguous and incomplete, ultimately lacking an end or a final close. For example, **Figure 4** illustrates one imaginative turn in the story where a flying child appears, without any relation to the prior storyline.

In phase three of treatment, changes in story development were positive in most of the participants: threats were taken under control and protagonists of the stories were able to find a safe space. At the same time, the development of support networks among characters signaled a shift in the ways in which characters behaved. Originally faced with social isolation, characters received help by others in order to move elsewhere or reach their own goals.

CONCLUSION

The present study explores the topic of creative play in therapy with child victims of sexual assault. In particular, it examines their therapeutic progress through the use of sandplay, or sand tray therapy, using a qualitative approach. These allows us to explore how children narrate and rewrite their lived experiences and how therapists serve as co-participants in the process of metaphorical reconstruction (Dale and Lyddon, 2000). Key findings show a common set of behaviors during play that are related to violence: characters involved in the game act in an aggressive manner, they require care and safety and act out imaginative endings to conflict. Moreover, there are marked differences in the different stages of treatment, showing a gradual progression toward the third stage, where the activity involved mobile play and the creation of meaningful worlds with more organized environments and an overall positive outcome.

Results are consistent with international studies on the subject (Cunningham and Macfarlane, 1996; Zinni, 1997; Homeyer and Landreth, 1998). Specifically, the use of digging or hiding

objects while playing with sand has been widely observed among children who have suffered from sexual abuse, which serves as a metaphorical representation of the secrecy surrounding such experiences (Cunningham and Macfarlane, 1996; Homeyer and Landreth, 1998). Nevertheless, it is important to analyze the specific meanings assigned by each child.

Creative materials employed during sandplay include people, fantasy figures and animals, all of which have been described by other authors during the use of therapy with child victims of sexual assault, specifically wild and domesticated animals, boyfriends, magicians, and superheroes (Cunningham and Macfarlane, 1996). In the present study, participants predominantly referred to male figures in their games, which may refer to an association between masculinity and authority or power. This is one aspect that may be explored in future studies.

One of the most relevant miniatures employed during the activity is the snake, which was progressively incorporated in child's narratives over the course of treatment. This has been detailed in previous studies on the symbolism of animals in therapeutic treatment of child victims of sexual assault (Cunningham and Macfarlane, 1996). During play sessions, snakes carry the connotation of causing harm and generating fear, and they are incorporated and taken away throughout the game. From an analytical perspective, the snake may be a phallic symbol over which the individual assumes control (Bettelheim, 2010). On this basis, and considering the presence of the snake as a prominent character in the third phase of therapeutic treatment under study, we may speculate that children begin to symbolically address sexualized aspects and feelings associated with experiences of abuse. Here, disassociated memories may emerge through metaphors employed during play once the child feels that the therapeutic space is safe and contained (Colombo and Beigbeder, 2005).

The composition of the game, which gradually becomes less chaotic over time, is similar to other experiences in past research on the presence of disorganization in sandplay with victims of sexual assault (Zinni, 1997). In these cases, the development of chaotic worlds reveals distortions in how children perceive their reality during an emotional crisis caused by a traumatic experience – a topic that would benefit from further analysis (Sjolund and Schaefer, 1994). In the present study, it is important to note that the composition of sandplay becomes more organized as treatment progresses.

Additional behaviors present during sandplay include sustained contact with the sand, particularly during the advanced phases of treatment. When children become distressed, handling sand may serve as a control mechanism for their emotions as they act out conflicts in the game. Many authors have regarded sandplay as a way to provide children with a sensorial experience that has therapeutic benefits by promoting relief and relaxation (Oaklander, 2001; Gil, 2006). Results of the present study as well as past research may speak about the important role that sand plays in the therapeutic process of children who have suffered from sexual assault. Sand provides them with a contrasting tactile experience where they may reconnect with their own body and experience positive and pleasurable sensations that promote physical and psychological wellbeing. Moreover, this activity

allows children to freely build and destroy their own creations, providing them with a sense of control that was taken away from them as a result of sexual abuse (Gil, 2006). Finally, the therapist may serve as both an observer and supportive figure, guiding the child in his or her own search for meaning.

With regards to game or play content, the topic of violence plays a central role in participants' stories. This has been also shown by previous studies (Zinni, 1997; Herane, 2005; Sandoval, 2005). Moreover, these findings are consistent with other studies using projective techniques, specifically Rorschach, which suggest that violence plays a central role for sexual abuse victims, affecting their inner world (Armstrong and Loewenstein, 1990; Kamphuis et al., 2008; Scimeca et al., 2015). These studies show that victims of sexual abuse tend to experience intrusion of traumatic memories into consciousness, as well as a negative perception of the world. They also tend to show a more disorganized perception of causality in the understanding of human relationships (Armstrong and Loewenstein, 1990; Kamphuis et al., 2008; Scimeca et al., 2015). Thus, it is possible to think that both, sandplay and projective techniques for personality assessment, share the common characteristic of allowing individuals to freely reproduce their inner world.

Similarly, the worlds that children create during sandplay invoke both fear and distress; the emotional atmosphere is reflected in content of the game, which reveals a traumagenic dynamic of defenselessness associated with experiences of sexual abuse (Finkelhor and Browne, 1985). As a result, children draw on the need for protection and care in their stories, and authority figures such as law enforcement (police) play a vital role, which is consistent with other research studies (Homeyer and Landreth, 1998).

Moreover, when taken together, results of the present study on behaviors and content are consistent with those presented in the literature on post-traumatic play—a ludic form of therapy observed with child victims of sexual assault (Terr, 1990; Cunningham and Macfarlane, 1996; Gil, 2006, among others). In this way, it is clear that traumatic events associated with violence are reproduced during treatment in terms of the level of engagement with certain topics and play objects, as well as stories associated with feelings of risk and threat, or more generally, an emotional state of fear and defenselessness. Unpleasant emotions experienced during the game, such as anxiety, are accompanied by analog movements such as delays, silences, and interruptions. These findings are consistent with clinical descriptions of post-traumatic play, and they underscore the value of monitoring and providing follow-up to ludic processes in a rigorous and systematic way (Terr, 1990) in order to promote approaches that respond to the changing needs of children.

At the same time, differences across categories in all three stages of the process provide insight into the evolution or progression of post-traumatic play over the course of psychotherapeutic treatment for child victims of sexual assault. Content of sandplay reveals a shift in terms of violence; in later phases, worlds developed during sandplay feature safer and more organized environments, as well as individuals who have the capacity to confront threats in their environment and arrive to a positive conclusion. Behavioral aspects of the game include

mobile play and the development of meaningful and coherent worlds. Fewer disruptions demonstrate a more integrated and less fragmented game.

These results are consistent with previous studies by scholars such as Gil (2006), who argue that the transition from stagnant to dynamic play is representative of a child's ability to slowly integrate emotions and thoughts affiliated with a traumatic experience and assign meaning to and assimilate the experience. While conflict and unpleasant emotions may still be present despite these transformations, the progression of post-traumatic play is clear. The game becomes more dynamic and encourages the child to approach the topic in a symbolic manner, empowering and providing him or her with an emotional release.

In general, while children may experience the pain and consequences of sexual abuse in different ways, study results show that there are certain common ludic expressions among child victims, which are demonstrated through sandplay at various points in time during psychotherapy. These expressions are consistent with findings from previous studies, and are representative of the primary challenges faced by this population. In addition, there are certain characteristics of sandplay which evolve over the course of psychotherapy, and which demonstrate key changes in play that may support children in redefining and assigning new meaning to their experiences.

The present study contributes to the literature by providing new insights on the application of sandplay as a therapeutic tool for child victims of sexual assault, opening up new lines of work on the process of overcoming abuse. In this sense, it is a major contribution to research which foregrounds children's perspectives and means of expression.

Findings of the present study reaffirm the value of therapeutic play in cases of sexual abuse, which can provide rich insight into the psychological resources of children that help to facilitate a positive emotional change. In this way, it may help the therapist to delve into the meanings that children develop and assign to their experiences and monitor their engagement with symbolic elaboration. Since the present study follows participants during 6 months of treatment and not necessarily to completion, future studies are needed to explore the evolution of creative play in terms of the entire psychotherapeutic process. Additional studies may benefit from a comparative analysis of the characteristics of sandplay in both the initial and concluding phases of treatment.

In methodological terms, the present study employs a longitudinal research approach to therapeutic treatment. Here, the researcher had direct access to medical records. It presents a focus the evolution of creative play and the value of exploring changes in play throughout the course of treatment, which is a research design that may be explored in more detail in future study. By conducting a general analysis of heterogeneous cases, researchers were unable to explore the particularities of each case in depth, which is considered to be a limitation of the present study. In addition, employing a conceptual framework such as sexual trauma may present a bias when interpreting results, thereby limiting understanding of different traumatic experiences or developmental challenges made visible through sandplay. Here, further study is needed. Moreover, the utilization of cameras in the therapeutic space was met with mixed reactions. It would valuable to further analyze the use of recordings as both a research tool and a therapeutic technique. Future research may draw on mixed methodologies (including verbal reporting) to complement results obtained by sandplay, and also evaluate other ludic techniques. It is also possible to explore this phenomenon at different developmental stages with children who have experienced other types of abuse and emotional distress in order to identify similarities and differences that provide greater insight into the phenomenon of creative play.

With regards to the practical implications of study results in clinical practice, sand tray therapy emerges as a useful tool for the treatment of child victims of sexual assault. In this study, it promotes an in-depth analysis of cases over an extended period of time, thereby providing clinicians with a tool that could give insight into how children resignify their experiences and transform and overcome sexual abuse. Finally, we may hypothesize that the creative potential of sand tray therapy is reached once a therapeutic bond is established – a hypothesis that should be addressed in future studies.

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The work was developed by MT and supervised by CC. CC also contributed to the process of analysis and triangulation of information and the article writing.

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The Non-linear Trajectory of Change in Play Profiles of Three Children in Psychodynamic Play Therapy

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Aim: Even though there is substantial evidence that play based therapies produce significant change, the specific play processes in treatment remain unexamined. For that purpose, processes of change in long-term psychodynamic play therapy are assessed through a repeated systematic assessment of three children's "play profiles," which reflect patterns of organization among play variables that contribute to play activity in therapy, indicative of the children's coping strategies, and an expression of their internal world. The main aims of the study are to investigate the kinds of play profiles expressed in treatment, and to test whether there is emergence of new and more adaptive play profiles using dynamic systems theory as a methodological framework.

Methods and Procedures: Each session from the long-term psychodynamic treatment (mean number of sessions = 55) of three 6-year-old good outcome cases presenting with Separation Anxiety were recorded, transcribed and coded using items from the Children's Play Therapy Instrument (CPTI), created to assess the play activity of children in psychotherapy, generating discrete and measurable units of play activity arranged along a continuum of four play profiles: "Adaptive," "Inhibited," "Impulsive," and "Disorganized." The play profiles were clustered through K-means Algorithm, generating seven discrete states characterizing the course of treatment and the transitions between these states were analyzed by Markov Transition Matrix, Recurrence Quantification Analysis (RQA) and odds ratios comparing the first and second halves of psychotherapy.

Results: The Markov Transitions between the states scaled almost perfectly and also showed the ergodicity of the system, meaning that the child can reach any state or shift to another one in play. The RQA and odds ratios showed two trends of change, first concerning the decrease in the use of "less adaptive" strategies, second regarding the reduction of play interruptions.

Conclusion: The results support that these children express different psychic states in play, which can be captured through the lens of play profiles, and begin to modify less dysfunctional profiles over the course of treatment. The methodology employed showed the productivity of treating psychodynamic play therapy as a complex system, taking advantage of non-linear methods to study psychotherapeutic play activity.

Keywords: psychodynamic play therapy, play assessment, play profiles, complexity science, non-linear dynamics

INTRODUCTION

The aim of this article is to demonstrate how a comprehensive method of play assessment can be applied to long-term psychodynamic play therapy sessions and to illustrate how this method can enhance the understanding of psychotherapy process. The process of change in psychotherapy is assessed through a repeated systematic assessment of the "play profiles" of three children who share similar demographic, diagnostic characteristics, and treatment courses. Play profiles summarize each child's pattern of play in each session using items from the Children's Play Therapy Instrument (CPTI; Kernberg et al., 1998) created to assess the play activity of children in psychotherapy. Each profile reflects coping and adaptive strategies used by children and reveals an understanding of their social and internal world. The profiles include discrete and measurable units of play activity arranged along a continuum of four clusters: "Adaptive," "Inhibited," "Impulsive," and "Disorganized." In line with the principles of therapeutic change in psychodynamic therapy, the evolution of the play profiles in treatment are studied through a complex system design which analyzes the non-linear and non-stationary trajectory of clinical improvement across time. The main hypothesis is to test whether there is a decrease in the "dysfunctional" play profiles around the middle of the treatment followed by a more functional reorganization in the last phase of psychotherapy. A further question concerns how this reorganization takes place and the indexes (if any) predicting it.

Shirk and Burwell (2010), in a recent review of core change mechanisms in psychodynamic process research, indicated that the changes in the child's capacity to play represent important targets for investigation. In this view, playing itself is a main agent of change (Winnicott, 1971; Target et al., 2005) which is also supported by a large body of developmental research indicating that play is critical for the child's cognitive, affective and social development (see Russ, 2004; for a review). Child's behaviors in play signify meaning and serve a communicative function reflective of the child's problems, conflicts, coping mechanisms, relationships and representations (Fonagy and Target, 2003). The aim of psychotherapy is to help the child build a rich and coherent play narrative, imagine the inner lives of the play characters and find solutions in play that can contain the intense feelings generated and cope with problematic situations (Slade, 1994). As the child learns to embrace the "pretend mode" (Fonagy and Target, 1998), the space between reality and fantasy that allows for transformations, he can flexibly use different patterns of play with different coping strategies to work on his issues in psychotherapy.

Even though there is substantial evidence that play based therapies produce significant change across a variety of childhood emotional and behavioral problems, most of these studies only report successful outcome without elucidating the specific links between play processes and treatment effectiveness (see Bratton et al., 2005; for the most recent meta-analysis of play therapy). In order to understand the specific pathways associated with change, one needs to focus on the processes that take place in psychodynamic child psychotherapy, so that what goes on in treatment itself can be related to changes at outcome (Shirk and Burwell, 2010).

In more recent years, there has been some effort to categorize the quality of children's play in psychotherapy and though sparse, there are a number of play measures with various degrees of empirical support (see Russ and Niec, 2011; for a review). Amongst these measures, CPTI (Kernberg et al., 1998) is a psychodynamically informed tool that can comprehensively assess the play activity of children with a clinical diagnosis. The scale involves three steps (see **Figure 1**): In the first step, the child's activity in the session is rated indicating the presence of one, or more, of the following observations: Pre-play; Play activity; Non-play; Interruption. Going forward *only play activity* is rated through a Descriptive Analysis of play activity taking into account the category of the play activity (e.g., gross motor, fantasy, game play, etc.), the child's capacity to initiate and facilitate play, (i.e., the child's autonomy in play), and the sphere of play (where the play takes place). The instrument also assesses the structure of the play in terms of affective components (types of affect expressed in play and affect regulation strategies), cognitive components (how objects and people are represented in play), and the themes of play and the child's use of language. In the Functional Analysis, the instrument assesses coping and defensive strategies, as well as a rating of the degree of the child's subjective awareness of himself/herself as a player.

An important focus of CPTI has been to examine changes in a child's activity in play sessions that occur over time (Chazan, 2000, 2001, 2002; Chazan and Wolf, 2002; Chari et al., 2013). The descriptive, cognitive, affective, and functional components shed light on different aspects of play on which a child can show improvement over the course of psychotherapy. Segmentation provides information regarding the overall progression of child play activity within the therapeutic hour and can be used to assess how much the child can engage in the play activity over the course of treatment. Chazan (2000, 2001, 2002) found that children who showed significant symptomatic improvement over the course of therapy also showed gains in the percentage of time spent in play activity as well as less time spent in non-play. The descriptive components help assess the child's capacity to initiate the play, which is associated with the child's sense of agency and freedom to play out his internal world in the presence of an adult using different mediums. In clinical populations where distressful or aggressive themes are more dominant, inhibition and disruptions are more clearly observed in carrying out of play to its completion (Howe and Silvern, 1981; Russ and Niec, 2011). Chazan (2000, 2002), Chazan and Wolf (2002), Chari et al. (2013) found that compared to pre-treatment, children at the end of treatment show more initiative in beginning and facilitating play and less inhibition of the play activity.

The affective components are a measure of the types and range of emotions exhibited by the child in his/her play, which are also reflective of feelings in his/her life. Perry and Landreth (1991), Chazan (2000, 2001, 2002) and Chari et al. (2013) found that over the course of treatment children show gains in pleasurable affect, less emotional discomfort as well as greater capacity for smooth transitions and regulation of affect. The cognitive components assess the structure of the representational world, that is the multiple representation of oneself in interaction with others (Sandler and Rosenblatt, 1962). This indicates the

FIGURE 1 | Dimensions of Children's Play Therapy Instrument (CPTI).
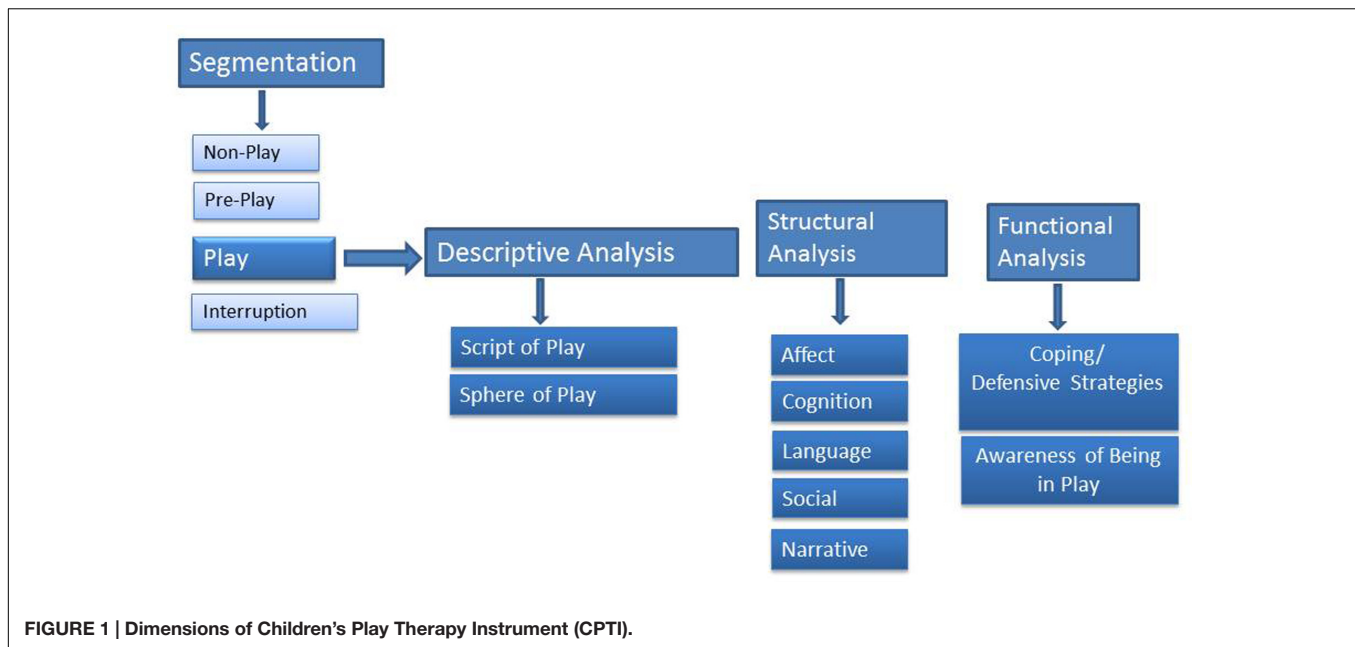
degree to which a child is capable of creating narrative structures to represent affect-laden relationships. Children with clinical problems are capable of simpler representations, where they may bring a solitary role to the play world, remaining more centered upon themselves in an egocentric fashion. Alternatively, the therapist or toys may be animated only as recipients, or extensions of the child's activities (Slade, 1994; Chazan, 2002). As the child uses the therapeutic play field to bring problematic scenarios and work on them with the help of the therapist, more complex representations emerge, with several characters in interacting roles, taking into account different generational and familial dynamics. In doing this, the child creates narrative structures that represent different relationships. In effect, Chazan (2000, 2002) and Chari et al. (2013) have also documented significant improvement in cognitive dimensions over the course of treatment. The concept of coping-defensive components takes on concepts from Vaillant et al. (1986), Perry (1990), and Kernberg (1994) and assess the spectrum of coping strategies and defenses that characterize the child's functioning in play. The prominence of adaptive defenses is characteristic of healthy coping and children are found to show more adaptive play strategies over the course of treatment (Chazan, 2002; Chari et al., 2013).

Apart from these individual indices, with the use of the CPTI, it is possible to identify patterns of organization among these CPTI play variables that contribute to play activity, resulting in *profiles* of play (Chazan, 2002). These profiles reflect a specific child's experience of himself/herself while playing as an outward expression of his inner thoughts and feelings, as well as his strategies for coping and adaptation. They can be understood as the child's trial efforts to resolve conflict, overcome obstacles and figure out social situations (Chazan, 2002). Chazan (2009) has identified four groups of children who share the same distribution of subscale variables corresponding to the following play profiles:

Adaptive, Impulsive, Inhibited, and Disorganized. These could be reliably differentiated from others and also showed support for construct validity (Chazan, 2012). Each profile condenses *different coping strategies* used by the child to deal with the challenges in his/her life.

The *Adaptive Play Profile* is the uninterrupted, forward-moving, joyful play activity where the child uses coping strategies like problem solving and anticipation to cope with sources of distress and discomfort in his play activity. Frequently used adaptive coping strategies include a capacity to enjoy the play situation, a capacity for resourceful manipulation and problem solving, and a capacity for representation and symbolization of disturbing experiences and fantasies. The *Inhibited Play Profile* portrays a struggle between unconscious conflicting needs and emotions which create the tensions that find expression through the child's play activity. Such children have difficulty sustaining free spontaneous play and express a narrow rigid range of affects, with predominant expression of anxiety and an overall somber tone. Coping strategies such as rationalization and isolation of affect are preferred where ideas are separated from their threatening affects. These children usually play alone and silently. The *Impulsive Play Profile* reflects more sharply the conflictual issues and is characterized by an absence of regularity in the flow, marked by outbursts and abrupt interruptions. These children try to cope with disturbing feelings through movement and activity. They rigidly divide the world between the bad and the good because of their difficulty integrating aggressive feelings. Anxiety and the aggression in play are acted out directly in behavior, without translation into symbolic representation. The *Disorganized Play Profile* is characterized by extreme anxiety. At these moments the child is communicating the dread of becoming completely overwhelmed. Such play involves many disruptions and little facilitation on the child's part. Play activity may involve sensori-motor levels below the child's developmental

age. Play characters and themes contain bizarre and overly aggressive elements and change without the child's control. Affect may be extreme, predominantly negative and inappropriate, at times involving intense fears of losing control. The child may lose awareness that this is play and feel surprised or frightened by what comes up. These children are unable to use common symbols communicated through the shared use of language.

The profiles reflect a continuum of coping strategies, some more adaptive than others. Children who primarily show characteristics of Adaptive Profile can use play toward gaining mastery by using strategies such as problem-solving, humor and anticipation in play. Children who show characteristics of the other three profiles use strategies that are less effective and use defenses that restrict their capacity to play. Children characteristic of the Inhibited Profile use strategies such as isolation of affect, rationalization and undoing to cope with emotional implications of the play in a neutral, factual, objective way, which results in a rigid play structure. Children characteristic of the Impulsive Profile use movement and activity to distance themselves from threatening experiences and use strategies such as denial and splitting which result in abrupt changes of affect and behavior and disrupt the flow of play. Children characteristic of the Disorganized Profile are unable to use a coping strategy and are overwhelmed by disturbing experiences that can feel traumatic.

In a series of single case studies (Chazan (2000, 2001, 2002), Chari et al. (2013), and Chazan et al. (2016) have shown that the profiles can be used to document changes across therapy with children ranging from ages 2 to 9 and varying levels and types of psychopathology such as Reactive Attachment Disorder, Major Depression, Social Anxiety, Narcissistic Personality Disorder, Borderline Personality Disorder, and Pervasive Developmental Disorder. In each case, the profiles provided a valuable tool for observation and empirical study of play of children with different psychopathologies. This common language for analysis of the play activity provided a systematic lens regarding the therapeutic process. Findings showed that each child started to show more Adaptive Profile characteristics as the treatment progressed. However, an important finding was that the Adaptive Profile was never free of conflict and defense and always existed with the presence of the other profiles. This implies that if the treatment is working effectively, the child uses the play scene to reenact certain problematic situations captured through the lens of Inhibited, Impulsive and/or Disorganized Profiles, however, still uses the play field as part of an overall coping effort to master these problematic scenarios. Thus, there is expected disorganization and displeasure during the treatment phase as children start to bring problematic issues into the play space. It is the completed reparation of the evoked issues that categorizes the treatment process as adaptive. This reparation can only happen through children's engagement in the play space to enact and work on problematic issues. In order to tap into this process, Chazan (2009) has created an index called Play Engagement that assesses the child's sustained interest in play over the course of treatment. Chazan (2012) and Chazan et al. (2016) have found that Play Engagement is positively correlated with Adaptive Play and also significantly improves over the course of treatment affording

the child the possibility to bring to play different aspects of his internal world.

As the profiles indicate, the act of play is a complex system, containing many different variables describing levels of relationship, levels of cognitive and affective development, as well as capacity for creating narrative. The function of these play profiles is to capture the essence of play activity in all its intricacy. Moreover, the transition between the profiles that happen over the course of treatment involve phases of integration as well as disorganization as the child faces problematic issues which are reworked in the safety of the play sphere. The emergence of different play profiles can hardly be controlled, and predicting at what point in time which aspects of the profiles come to the fore is extremely difficult. In this case, an appropriate methodology that captures the essence of the play activity is needed in order to study the therapeutic process through the lens of play. Quite recently, there have been a number of applications of non-linear dynamic systems perspective to psychodynamic practice with children, which can take into account the various components of the therapy space as well as a non-linear therapeutic action of change which are so central to psychodynamic theories (Coburn, 2002; Sander, 2002; Tyson, 2005; Galatzer-Levy, 2009). The essential characteristics of the theory include the presence of a large number of elements that interact in a dynamic fashion where any element of a given system influences and is influenced by many others. Interactions are also non-linear, which insures that there can be abrupt and unexpected changes. Another main premise of the theory is that for change to happen, there needs to be alternation between stable states and disorganization through which new and more flexible forms of functioning can emerge (Coburn, 2002).

Recognizing the importance of discontinuous changes in psychotherapy process, some authors have included the theories of non-linear systems and self-organization in their concepts of psychotherapeutic change (Tschacher et al., 2000; Gumz et al., 2013; Schiepek et al., 2014; de Felice and Andreassi, 2015; Orsucci, 2015) combining psychodynamic considerations and a self-organization theory of synergetics. The general idea here is to treat the therapeutic space as a complex system that may be characterized by processes of pattern formation with stable and unstable episodes (i.e., phases in which the system elements fluctuate to varying degrees) and abrupt transitions. In terms of the dynamic systems theory, a pattern which characterizes the behavior of a dynamic system over a period of time in a relatively stable manner is referred to as attractor in the sense of an attractive dynamic state. If we consider the play profiles of the children, we can regard the emerging "profiles of play" as attractors (stable states). In other words, a specific play profile dominates the psychotherapy field until the child is ready for shifting toward a new organization. A transition from one stable play profile to another can occur via temporary destabilization of the system. Such destabilization occurs when the energy level of the system is changed. If a certain energy level is reached, that is, if a certain control-parameter limit has been exceeded, increasing instability leads to critical fluctuations. In such cases, system behavior can abruptly switch to a new pattern of behavior. During that period of fluctuations, the system is open for processing

new information, ready to explore potentially more suitable configurations. There is, at this stage, an alternation between older and less functional forms of internal organization and new, emerging configurations.

Aims of the Current Study

In the present study, the processes of change were investigated through the lens of play activity, in three single case long term psychodynamic treatments, by comparing changes in play profiles as the therapy progresses. In accordance with specified criteria for replicated single-case design, a small set of successive cases with the similar demographic characteristic and the same presenting diagnosis were examined (Ollendick et al., 2006). Single case research has often been indicated as one of the most suitable approach for evaluating psychodynamic process and used effectively in process and outcome research (e.g., Hilliard, 1993; Orlinsky et al., 2004). The cases were three 6-year-old girls with a presenting problem of Separation Anxiety. This age group and the presenting problem are amenable to study change processes in psychodynamic child psychotherapy as documented in a recent review by Midgley and Kennedy (2011) who found that younger children appear to benefit more from psychodynamic psychotherapy than older ones, with the likelihood of improvement during treatment declining with age and children with Internalizing Disorders, especially with anxiety and depression, seem to respond better than those with disruptive/Externalizing Disorders.

The main research questions investigated are: (a) whether there is a reconfiguration in the children's internal world operationalized as a change in the CPTI play profiles over the course of treatment; (b) whether there is emergence of new and more functional organizations of CPTI play profiles in the second phase of the treatment. In case these questions are verified, the indices predicting the change of the children's internal world are also investigated. For these purposes, the children's play profiles were calculated by the CPTI coding system taking into account four different play profiles, Adaptive, Inhibited, Impulsive, and Disorganized. Moreover, in order to understand more specifically how the children used the play space, their level of "Play Engagement," the "Play Themes," and "Relational Themes in Play" were also taken into account. These variables were clustered and their development was studied with the aim of understanding the evolution of profiles in the three treatments by non-linear time series analyses such as Markov Transition Matrix, Recurrence Quantification Analysis (RQA) and odds ratios comparing the first and second halves of psychotherapy.

MATERIALS AND METHODS

Participant Selection and Description

The patient data came from the Istanbul Bilgi University Psychotherapy Research Laboratory, established in order to study the psychotherapy processes conducted at Istanbul Bilgi University Psychological Center, which provides outpatient psychodynamic psychotherapy and professional training at

master's level for students in the Clinical Psychology Program. Participants were not recruited for participation in a research study, in an effort to increase generalizability and limit sample-selection bias. Further, it was the intention of the researchers to examine the process of psychodynamic psychotherapy with children commonly encountered in real-world clinical settings, which is in contrast to a highly controlled sample, typically sought in treatment-outcome studies.

Sample selection occurred following completion of study planning and was based upon the following inclusion criteria: ages between 4 and 10 years old; average intelligence; motivation for treatment; no psychotic symptoms; no significant developmental delays; no significant risk of suicide attempts; no drug abuse. The children of the three families included in this study were three Turkish females, all 6 years old. All children were brought to therapy because of anxiety due to separating from their mothers and problems with school attendance. All families were from a middle socioeconomic status (mid SES) composed of married biological parents. Each of the children had at least one sibling. The educational level of the parents included a graduate equivalency diploma. None of the children had previously been in psychotherapy. The parents provided written informed consent and the child provided oral assent concerning use of their data for research purposes. This research was approved by Istanbul Bilgi University Ethics Committee.

Treatment Integrity and Outcome

The therapists, therapists' training, and supervision. All patients had different therapists, who were female, master's level clinicians with 1–2 years of professional practice experience. Formal training included theoretical background of psychodynamic play therapy and its various applications 1 year prior to the study. All therapists were supervised by experienced psychodynamic play therapists during the study. In this way, the confounding variables rooted in differences in the educational background, experience, and supervision process were partially controlled.

Treatment

The treatment was psychodynamic play therapy. The treatment was not manualized and the only restrictions placed were regularity and length (once weekly treatment of 50 min for 1 year). Patient 1[1] (Rengin) received 59, patient 2 (Esin) received 55 and patient 3 (Canan) received 47 sessions. Even though there is no unitary model of therapeutic action in psychodynamic play therapy (Fonagy, 2004), the core principles and techniques employed can be summarized as follows: central to this approach is the establishment of what is called a "setting." The psychotherapist sees the child at regular times, in the same play room with a standard set of play toys. This consistency provides a safe context that allows the child to play out difficult and disturbing emotional experiences that would be hard to express in the outside world. The exploration of the child's issues

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[1] All potential identifying information on the patients, including names, was altered in order to protect her identity.

	Pre-treatment	Termination	RCI > 1,96
Patient 1 (Rengin)			
CBCL Internalizing Problems	**63**	50	4,64*
CBCL Anxiety Problems	***65***	57	6,67*
CGAS	56	78	4,26*
Patient 2 (Esin)			
CBCL Internalizing Problems	*67*	46	7,05*
CBCL Anxiety Problems	**66**	50	13.33*
CGAS	51	75	4,65*
Patient 3 (Canan)			
CBCL Internalizing Problems	**61**	45	5.71*
CBCL Anxiety Problems	**64**	50	11.66*
CGAS	50	79	5,16*

*Bolded and italicized scores indicate, respectively, borderline and clinically significant scores. *RCI significant. CBCL, Child Behavior Checklist; CGAS, Children's Global Assessment Scale; RCI, Reliable change index.*

takes place in a largely child-led process way and the therapist encourages the child to express and reflect on his perceptions, feelings and thoughts in play. This is done by listening actively and inviting the child to continue his communications and asking questions about the play setting, temporal ordering, and the details of the characters, their thoughts, feelings and behaviors. Interpretations aim to help the child see links between conflicting needs and emotions about self and others that find reflection in play behaviors and in the therapeutic relationship with the purpose of bringing to consciousness attitudes, assumptions and beliefs of which the child is unaware.

Assessment of Psychotherapy Outcome

Overall, each child presented with separation anxiety problems and demonstrated marked reduction in symptoms during treatment. At initial assessment interviews, each child's scores on The Child Behavior Checklist (CBCL; Achenbach, 1991; Erol et al., 1995), a widely used method of identifying problematic behaviors in children, were at the borderline or clinical level for "Internalizing Disorders" and "Anxiety Problems" on CBCL's Diagnostic Statistical Manual (DSM) oriented Scales, indicating the need for treatment (see **Table 1**). On the CBCL, the clinical cut-off for the "Internalizing" subscale is 64 and for "Anxiety Problems" the clinical cut-off is 70. According to Jacobson and Truax (1991) the "Reliable and Clinically Significant Improvement" was used as a measure of change over the two time-points. Reliable Change Index (RCI) for CBCL and The Children's Global Assessment Scale(CGAS; Shaffer et al., 1983) a numeric scale (from 1 to 100) used by mental health clinicians to rate the general functioning of children, were calculated as improved if the patient's scores at termination, when subtracted from scores at admission, and divided by the standard error of the instrument were above 1.96. Norm data for the CBCL and CGAS were used to assess individual scores in relation to clinically significant change. Notably, RCI indicated clinically significant change from pre to post-treatment on relevant CBCL subscales (see **Table 1**). For CGAS each child's scores on global functioning fell within the good functioning range at post-treatment and RCI

was significant. Given that the patients crossed the limit from clinical to normal population and this change is not attributable to measurement error, we concluded that changes in scores are clinically significant. Having demonstrated that these were 'good outcome' cases, the nature of the change across the course of therapy was investigated using the CPTI.

Instruments and Play Profile Calculations
Assessment of Play Activity

Children's Play Therapy Instrument (CPTI; Kernberg et al., 1998) rates children's behavior in a therapeutic setting at different levels (see **Figure 1**; for further definition of play activity categories, see Chazan, 2000, 2001, 2002; Chazan and Wolf, 2002). The play profiles are calculated in three steps. The first step involves a "Segmentation of the child's activity" (non-play, pre-play, play and interruption). Going forward, *only play segments* are rated.

Once the play segment has been identified, the second step involves rating the play segment on individual CPTI items. These CPTI items all belong to a particular component, listed under different theoretical levels of analyses (i.e., descriptive, structural, and functional), defining an aspect of play activity. Each of these items is scored using a 5-point Likert scale: 5 = Most Characteristic; 4 = Considerable Evidence; 3 = Moderate Evidence; 2 = Minimal Evidence; 1 = No Evidence. In order to provide an example of scoring, in the play sphere component, under descriptive analysis, there are three items: autosphere, microsphere, and macrosphere. Each item is assigned a score from 1 to 5, answering the question "does the child use actual space of the room?" (macrosphere), "does the child play in the miniature toy word?" (microsphere), "does the child play with reference to his body?" (autosphere). The same process takes place for each item of the scale. After all these items are scored, the profiles are calculated manually by taking an arithmetic average of particular items associated with each profile (see calculation of profiles below). Before explaining the calculation of profiles, we will provide a description of each play component

1. The *Descriptive Analysis* includes components that describe the play observed:
   1a. Script Component of Play Activity: This components looks at the contribution of the child to the unfolding of play activity.
   1b. Sphere Component of Play Activity: This component looks at the spatial realm within which the play takes place taking into account whether the child plays with reference to his body, in the realm of miniature toys or using the actual space of the room.
2. The *Structural Analysis* is comprised of the underlying processes necessary for the formation of characters and the telling of a story and uses the following four components:
   2a. Affective Component. This component looks at the types, range, and regulation of emotions brought by the child to play.
   2b. Cognitive Component. This component looks at the level of role play, specifically Complex, Dyadic, and Solitary Roles, and how persons and objects are depicted, specifically Realistic, Magical, and Bizarre Representations, and if

Transformations occur in the way persons, toys, and other objects are used. It is critical to note if these transformations of characters, or objects, occur unexpectedly.

2c. Language Component. This component looks at the kinds of language used by the child.

2d. Social Component. The social level of play indicates interaction of the child playing with the therapist.

2e. Narrative Component. This component looks at the relational themes of the interactions (i.e., autonomous, dependent, malevolent control) and play themes.

3. The *Functional Analysis* of the child's play activity is used to observe coping/defensive strategies of the child.

3a. Coping and Defensive Strategies Component is grouped along a continuum into four items: *Defense Cluster 1* (Adaptive, i.e., adaptation, problem-solving, sublimation, humor), *Defense Cluster 2* (Conflicted, i.e., intellectualization, doing and undoing, somatization, avoidance), *Defense Cluster 3* (Polarized, i.e., splitting, projective identification, omnipotent control), *Defense Cluster 4* (Extreme Anxiety, i.e., dispersal, fusion, dedifferentiation, autistic encapsulation, freezing).

3b. The Child's Awareness of Himself as Player indicates his awareness of being in a state of play.

Calculation of Play Profiles

As per the manual, four clusters of Profiles were calculated: the Adaptive Profile; the Impulsive Profile; the Inhibited Profile; and the Disorganized Profile. In addition another index that reflects the child's overall "Play Engagement" was used in order to reflect the child's overall investment in play. These profiles are calculated by calculating a composite score using each CPTI item that is associated with this profile (see **Table 2**). In order to create the composite profile scores, all the specific items under each profile were summed and then divided by the number of items in that category. Because all the items are scored on a scale of 1–5, a standardization procedure is not needed. These overall scores are used for each profile. The internal consistency of the profiles was tested by Cronbach alpha and the scores varied between 0.66 and 0.77 indicating good reliability.

The specific CPTI items that contribute toward each Profile are as follows:

Adaptive profile

Facilitation of Play, Play in Microsphere, Regulation of Affects: Flexible, Smooth Transitions between Affects, Hedonic Affective Tone: Pleasurable, Appropriate Affect Expression to Play Content, One or More Play Roles, Voluntary Transformation of Play Roles, Talking about the Play (Verbalization of Roles, Describing the Play, Defense Cluster 1: Adaptive Strategies, Awareness of Being in a State of Play.

Inhibited profile

Inhibition of Play, Hedonic Tone: Somber, Spectrum of Affects: Narrow, Regulation of Affects: Rigid, Solitary Play Roles, Level of Relationship: Self-Related, Use of Language: Silence, Play Alone, Defense Cluster 2: Conflicted Strategies.

Impulsive profile

Inhibition of Play, Play in Macrosphere, Affective Tone: Overt Distress, Regulation of Affect: Rigid, Abrupt Transitions Between Affects, Affect Type: Anger, Involuntary and Fluid Transformation of Play Roles, Magical Representations, Defense Cluster 3: Polarized Strategies, Unaware of Being in a State of Play.

Disorganized profile

Inhibition of Play, Affective Tone: Overt Distress, Inappropriate of Affect to Content, Affect Expressed: Anger; Involuntary and Fluid Transformation of Play Roles, Bizarre Representations in Play, Isolated Play, Defense Cluster 4: Extreme Anxiety Strategies, Unaware of Being in a State of Play.

Play engagement

Facilitation of Play, Hedonic Affective Tone: Pleasurable, Regulation of Affects: Flexible, Smooth Transitions between Affects, Defense Cluster: 1 Adaptive Strategies.

The first author was trained by Saralea Chazan on the use and adaptation of CPTI. The CPTI was translated and back translated for use in Turkey. A group of seven graduate students and an experienced clinical psychologist with 10 years of clinical experience evaluated the language and statement comprehensibility of the scale. The scale was finalized following necessary modifications according to the feedback received during this evaluation. Two masters level clinical psychology students who received 20 h of training on the CPTI by the first author and rated 10 training sessions (24 play segments) prior to the study rated the sessions. They were independent assessors who were not associated with the treating clinicians or the cases, and blind to the purposes of the study. In order to identify the agreement level between judges for this current study, we calculated the Interclass Correlation Coefficient (ICC) for ordinal variables which ranged from good to excellent (ICC = 0.78–0.89).

Coding and Ratings of Sessions

All the sessions were videotaped and transcribed verbatim. Using the CPTI, the all the sessions were segmented. The number of segments for a session ranged from 4 to 7 ($M = 5$, $SD = 1.3$). These segments were chunked into four categories: Pre-play, Play Activity, Non-play, and Play Interruption. As per CPTI coding manual, the longest Play Activity segment within a session was used for further analyses.

Data Analytic Strategy

The CPTI coding of play segments generated four main profiles: Adaptive, Impulsive, Inhibited, and Disorganized. In order to have as much information as possible regarding the child's use of the play space, three other indices were included into the analyses: The children's "Play Engagement," the two most characteristic "Play Themes" and "Relational Themes in Play." The rationale for data analysis can be summarized as follows: Our goal was to quantify play dynamics of each patient and study its evolution. In order to do so we tested whether the descriptors we use to codify play activity have the same meaning for all the patients. This was made by checking the invariance between descriptors'

TABLE 2 | Children's Play Therapy Instrument (CPTI) Profile Items.

CPTI Categories	Adaptive Profile	Inhibited Profile	Impulsive Profile	Disorganized Profile	Play Engagement
Script Description Play Sphere	Facilitate Play Microsphere	Inhibition	Inhibition Macrosphere	Inhibition	Facilitate Play
Affective Components	Flexible Affect Regulation	Rigid Affect Regulation	Rigid Affect Regulation	Rigid Affect Regulation	Flexible Affect Regulation
	Smooth Affect Transitions		Abrupt Affect Transitions		Smooth Affect Transitions
	Pleasurable Tone	Somber Tone	Overt Distress	Overt Distress	Pleasurable Tone
			Anger Expression	Anger Expression	
		Narrow Affect Spectrum			
	Appropriate Affect to Content			Inappropriate Affect To Content	
Cognitive Components	At Least one Play Role	Solitary Play Roles			
		Self-Related Relations			
	Voluntary Transformation of Play Roles		Involuntary and Unstable Transformations	Involuntary and Unstable Transformations	
			Magical Play Roles	Bizarre Play Roles	
Language Components	Verbalizing Characters	Silence			
	Describing Play				
Social Components		Play Alone			
Coping and Defensive Strategies	Adaptive	Conflicted	Polarized	Extreme Anxiety	Adaptive
Awareness of Being in a State of Play	Aware		Unaware	Unaware	

correlation structure (Pearson correlation coefficient) across different patients. The three cases showed the same correlation structures across treatment for play profiles as demonstrated by their common negative correlation between Play Engagement and Disorganized and Inhibited Profiles ($-0.86 < r < -0.63$, $p < 0.01$); positive correlation between Disorganized, Impulsive and Inhibited Profiles ($0.46 < r < 0.62$, $p < 0.01$); and a positive correlation between Adaptive Play and Play Engagement ($0.51 < r < 0.62$, $p < 0.01$) making them susceptible to cross-comparisons. Afterward, we looked for 'discrete states' in terms of clusters that can describe the entire psychotherapy space through K-means cluster analysis. In this analysis, each cluster corresponds to a specific average profile in the descriptor space. The trajectories between clusters were analyzed through Markov Transition Matrix, which can be thought as consecutive transitions in which at each discrete time point, the system decides to remain in the same cluster or shift to another one. This also tests for the ergodicity of the system answering whether the child can reach any state or shift to another one in play. We also checked for change in state probabilities among the first and second halves of the therapy. RQA is a widely used non-linear time series analysis tool that builds upon the repetitions (recurrences) of the same state in time, thus it is perfectly suited to investigate such volatility in the series in psychotherapy process research.

RESULTS

Clusterization of Play Variables

Firstly, in order to understand how these different variables are grouped together, a clusterization procedure was conducted. With the aim of finding the best cluster solution, we took the first peak of explained variance followed by a decrease or at least a stationary value. The first peak followed by a stationary value corresponded to the seven clusters solution, explaining the 74% of variance. Consequently we performed a K-means clusterization on the dataset with the seven cluster solution. Each cluster corresponds to a specific pattern of the play variables. We called these specific patterns "states" of the complex system composed of our three single cases' play profiles and play characteristics during each play segment. (see **Tables 3** and **4**).

Clinical Description of Each Cluster

In the first cluster, the children show their lowest scores for Adaptive Profile (2.70) and Play Engagement (3.55) and highest scores for Inhibited Profile (2.18). This kind of play is typically somber in tone, characterized by rigidity and the expression of anxiety. There are no significant interactions with others or imagined roles portrayed. The predominant narrative themes in this cluster centered about issues around cleanliness. In the second cluster, the children's Adaptive Profile (3.08) and Play

TABLE 3 | Cluster Table of CPTI variables.

Final Cluster Centers

	Clusters						
	1	2	3	4	5	6	7
Play Engagement	3.55	3.76	3.71	3.79	3.90	3.51	3.90
Adaptive Play	2.70	3.08	2.91	3.17	3.03	2.86	3.16
Inhibited Play	2.18	2.02	2.04	1.94	1.91	2.08	1.90
Impulsive Play	2.30	1.97	2.00	2.55	1.68	2.00	2.30
Disorganized Play	1.98	1.78	1.85	2.04	1.61	1.89	1.82
Narrative Theme (Most characteristic)	3	2	6	11	5	2	3
Narrative Theme (Second most characteristic)	3	6	2	3	8	2	3
Relational Theme (Most Characteristic)	6	2	2	2	2	2	2
Relational Theme (Second most characteristic)	4	4	4	3	4	4	3

The specific patterns between variables describe their cluster membership.

Engagement Characteristics (3.76) are at their second highest value and the other profiles are relatively suppressed. This kind of use of the play space show initiation, facilitation and shifting of play activity; overall expression of pleasant flexible emotions, multiple characters in play under the creative control of the child, descriptive language of play activity and higher levels of social development involving reciprocity and cooperation. Play themes revolve around attachment and issues regarding affection and nurturance as well as danger and protection. The child is primarily showing dependent relational qualities in play. In the third cluster, the children's profile scores are relatively suppressed compared to other clusters with play themes again having to do with separation, attachment, danger/protection and nurturance. It is possible that the children are externalizing their issues without significant coping strategies and just using the play space as a scene to put forth their concerns. In the fourth cluster, the children show highest scores for Adaptive Profile (3.17), Impulsive Profile (2.55) and Disorganized Profile (2.04) and scores for Play Engagement (3.79) are at their second highest value. The play themes revolve around aggression and cleanliness. The dominant relational quality among play characters is again dependent. It is possible to surmise that the adaptive component helps the child show disorganized and impulsive strategies without a significant rupture in their play engagement and thus try out less adaptive strategies in the safety of the play space. In the fifth cluster, the child shows similar characteristics as in the second cluster, most predominantly showing adaptive strategies and suppressed scores for other profiles with the highest scores for Play Engagement (3.90). There are new themes in play having to do with competition and construction indicative of the child's ability to expand the play narrative. In Cluster 6, the children's Play Engagement (3.51) scores are at their lowest value, and Adaptive Profile (2.86) is at its second lowest value whereas Inhibited Play (2.08) is at its second highest. This kind of play is again indicative of rigidity, conflict and anxiety as in Cluster 1, with play themes focused on issues regarding attachment and separation. The children are precluding mutual social interactions and showing primarily dependent relational qualities. Finally, Cluster 7 shows relatively

high scores for Adaptive Profile (3.16) as well as Play Engagement (3.90) with also Impulsive Strategies at their second highest value (2.30). Play themes revolve around attachment, however, there are also issues regarding aggression. There is an adaptive use of the play space, however, the children also show impulsive strategies characterized by an absence of regularity in the flow and modulation of the play activity which may be marked by outbursts and abrupt interruptions. This style of playing is linked with expression of feelings through movement and activity.

Markov Transition Matrix

The trajectories between these states can be thought as consecutive transitions in which at each discrete time point the system decides to remain in the same cluster or shift to another one. This kind of dynamics can be formalized in terms of first order Markov chains (or transition matrixes) reporting as rows the states at time t, and as columns the state at time t+1. Each i, j element of a Markov Transition Matrix reports the relative frequency of a single step transition from state i to state j across the entire series. The transition matrix of the studied series is performed according to the above description. Visually we could represent the transition matrix with a diagram through which the main features of this complex system composed of the children's psychic states are shown (**Table 5**; **Figure 2**). The transition matrix of the three single cases shows the emergence of an attractor composed of the states 2 and 6. This oscillation represents the most frequent dynamic in terms of probability of this system.

Recurrence Quantification Analysis (RQA)

The sequences of seven states can be turned into a still more basic binary series by putting a 0 every time the trajectory does not change state and a 1 when it changes (independently of the particular state). These binary series are strictly related to the temporal evolution of the system variability: long sequences of 'zeros' point to low variability (or volatility or entropy), on the contrary long sequences of 'ones' to extremely variable regimes. RQA is a widely used non-linear time series analysis

TABLE 4 | Cluster Membership of 3 patients' Play Segments.

	Cluster Membership		
Play Segments	Patient 1 (Rengin) Cluster Memberships	Patient 2 (Esin) Cluster Memberships	Patient 3 (Canan) Cluster Memberships
1	3	2	6
2	6	2	6
3	3	2	2
4	3	3	5
5	2	6	3
6	6	2	6
7	2	2	6
8	3	6	2
9	5	3	7
10	5	2	6
11	7	5	6
12	4	7	2
13	2	2	6
14	2	2	6
15	2	5	6
16	3	2	2
17	2	1	2
18	7	5	2
19	3	2	5
20	3	5	3
21	5	6	2
22	2	6	2
23	2	6	5
24	5	1	3
25	6	1	6
26	6	7	2
27	2	3	3
28	2	6	3
29	5	2	3
30	2	2	7
31	2	6	7
32	2	2	2
33	6	2	3
34	5	6	2
35	2	1	2
36	2	6	6
37	6	3	3
38	2	2	7
39	6	6	6
40	5	2	7
41	2	6	4
42	7	7	4
43	6	2	3
44	6	6	3
45	3	5	7
46	4	5	4
47	2	6	3
48	3	2	
49	7	3	
50	2	3	

(Continued)

TABLE 4 | Continued

	Cluster Membership		
Play Segments	Patient 1 (Rengin) Cluster Memberships	Patient 2 (Esin) Cluster Memberships	Patient 3 (Canan) Cluster Memberships
51	3	6	
52	4	1	
53	3	3	
54	3	1	
55	5	6	
56	3	6	
57	5	5	
58	3		
59	5		

tool invented with the aim of studying the repetitions (i.e., recurrences) of the same symbol (i.e., state) over time, thus it is perfectly suited to investigate the above mentioned variability. Therefore, we compared the Recurrence and Determinism values of the three time series with 30 artificially generated randomly shuffled series. The Recurrence and Determinism values for the real time series were 0.626 and 0.462, whereas the shuffled series were 0.626 and 0.503, respectively, which shows that there was no difference in terms of recurrence between the shuffled series and the real ones. This means that the three single cases don't have a specific trend. They stay or leave a given state in a given period of time with the same frequency as a randomly shuffled series does. Given that there is no trend within the three single cases we further investigated what the transitions depend on.

Ergodicity Analysis

Ergodicity checks whether the time spent by a system in some region of the phase space is proportional to the area of this region. In our case that is to say that the probability of transition from the state I to state j is proportional to the relative frequency of state j. Given the relative 'distance' between the states (how big their profile differences are) does not influence the transition probability, this implies the entire phase space is 'reachable' by any position. We found in fact that the very high Pearson Correlations between the composite frequency and number of

TABLE 5 | Markov Transition Matrix.

Clusters	1	2	3	4	5	6	7
1	16.66	0.0	16.66	0.0	16.66	33.33	16.66
2	2.08	35.41	16.66	0.0	14.58	25	6.25
3	3.33	20	20	6.66	16.66	20	13.33
4	0.0	33.33	50	16.66	0.0	0.0	0.0
5	0.0	36.84	26.31	0.0	10.52	15.78	10.52
6	8.33	36.11	13.88	0.0	11.11	25	5.55
7	0.0	30.79	15.38	23.07	0.0	23.07	7.69

Clusters represent the transition probabilities between different states (i.e., the child's ways of using the play activity).
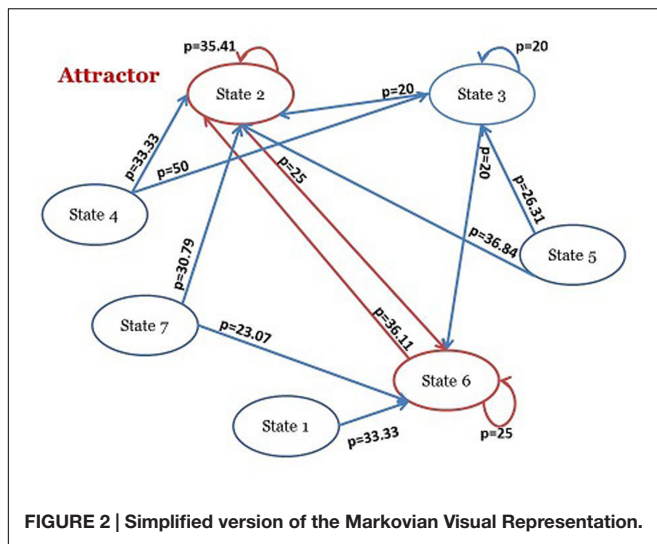
FIGURE 2 | Simplified version of the Markovian Visual Representation.

TABLE 6 | Correlation Matrix between the Number of Transitions and Composite Frequency.

Correlation Matrix	Distance	Number of Transition	Frequency State "I"	Frequency State "J"	Composite Frequency
Distance	1.00	−0.47**	−0.34*	−0.34*	−0.48**
Number of Transitions		1.00	0.51**	0.51**	0.91**
Frequency State "I"			1.00	−0.16	0.57*
Frequency State "J"				1.00	0.57*
Composite Frequency					1.00

*Correlation is significant at the 0.05 level; **Correlation is significant at the 0.01 level.*

transition reveal that any point of the entire phase space can be reached by any other point of the same space (**Table 6**). In fact, the number of transitions scale almost perfectly ($r = 0.91$, $p < 0.01$) with the composite frequency and the correlation remains high even if we eliminate the effect of distance (partial $r = 0.89$). This implies that the entire phase space is 'reachable' by any position. So in terms of the child's different ways of using the play space, according to our data set, no stable configuration took place and the situation is still fluid and reversible. However, whether and how the psychic system of each of the three patients is evolving over time still needs to be tested.

Evolution of Play Profiles Over Time: Odds Ratios

Some states could be more frequent in the late phase (second half of the therapy), and others could be more frequent in the initial phase (first half of the therapy). We investigated the evolution dynamics of each state counting the number of occurrences in the first and in the second half of the therapy in terms of odds ratio (**Table 7**). The results showed a slight decrease in the occurrence of clusters 7 and 6 for patient 2 (Esin) and

TABLE 7 | Odds Ratios of Each Cluster per Patient in the First and Second Halves of Therapy.

	Patient 1 (Rengin) Odds Ratio	Patient 2 (Esin) Odds Ratio	Patient 3 (Canan) Odds Ratio
Cluster 1	n.d.	1.03	n.d.
Cluster 2	1.14	1.298	2.09
Cluster 3	1.03	0.781	0.229
Cluster 4	0.515	n.d.	n.d.
Cluster 5	1.03	1.37	n.d.
Cluster 6	0.825	0.622	3.128 *1.82ES*
Cluster 7	1.03	2.08 *1.61ES*	0.206
Mean	0.795	1.025	0.807
SD	0.407	0.655	1.270

n.d., non determined (i.e., the denominator of the ratio is equal to 0). Italics show the standard errors from the mean. The analysis does not show any statistically significant p-values (95% CI).

TABLE 8 | Odds Ratios of Type of Activity per Patient in the First and Second Halves of Therapy.

	Patient 1 (Rengin) Odds Ratio	Patient 2 (Esin) Odds Ratio	Patient 3 (Canan) Odds Ratio
Non-Play	0.809	0.513	0.714
Pre-Play	1.083	0.56	1.555
Play	1.034	1.65	0.958
Interruptions	*21.48ES*	1.32	0.5
Mean	1.23	1.01	0.93
SD	0.52	0.56	0.45

Italics show the standard errors from the mean. The analysis does not show any statistically significant p-values (95% CI).

patient 3 (Canan) respectively. Patient 1 (Rengin) instead, did not show any changing trend but probably acquired awareness of her troubling internal states by experiencing them within the play segments. We tested this further hypothesis by calculating the odds ratios of time spent in play, non-play, pre-play, and interruptions for each patient. We expected that Rengin increased the number of play segments in the second half of treatment. This hypothesis was partially verified (**Table 8**). Rengin decreased the number of interruptions during play over the course of the second half of treatment to some extent, an index that seems related to the acquired competence to deal with troubling internal states in play.

DISCUSSION

This paper proposed a novel model to study change in psychodynamic play therapy looking at the play field as a complex system. The processes of change were assessed through a repeated systematic assessment of three children's play profiles, and their evolution over time. Our research questions were partially confirmed. We found a change in terms of the reduction in the occurrence of Clusters 6 and 7, however, we have not seen the emergence of a new play profile. The results showed two distinct mechanisms of change that can illuminate the process

and trajectory of improvement: The emergence and expression of the children's psychic states in play, as shown in the ergodicity of the system, which implies that the child can move between different states at any given point in time to express and work on different aspects of his internal experience in play; and the early process of modification of less dysfunctional states in play, as demonstrated in decrease of some less adaptive profiles and a decrease in play interruptions.

Evolution of Play Profiles

The first research question had to do with investigating whether there is a reconfiguration in the children's internal world operationalized as a change in the CPTI play profiles, play and relational themes over the course of treatment. Instead of a definitive reconfiguration, we found that children used psychotherapy to express different psychic states associated with their presenting problems. The results showed that the oscillation between Clusters 6 and 2 were the most frequent dynamic of the treatments. The clinical content associated with each cluster showed that Cluster 2 had to do with the predominance of the Adaptive Profile and Play Engagement, whereas Cluster 6 had to with Inhibited Profile and low levels of Adaptive Play and Play Engagement. The fact that the children expressed similar play and relational themes in Clusters 2 and 6, mainly having to do with issues regarding attachment, separation, danger, and protection, shows that these clusters represent two different coping strategies for similar play narratives. Children with Separation Anxiety are known to suffer from excessive fear and distress concerning separation from home or significant attachment figures, worrying about their own or their parents' safety. The play themes are reflective of these concerns, and in Cluster 6, create significant inhibition and conflict. This is consistent with literature that shows that anxious children have been shown to play solitary, engage less readily in dyadic play and are more inhibited in play (Christian et al., 2011). However, children in our study are oscillating between Inhibited (Cluster 6) and Adaptive Profiles (Cluster 2) in face of the emerging issues, which parallels prior findings by (Chazan, 2002; for a review), who showed that children use the play scene to reenact certain problematic situations which can cause temporary stagnation, however, as long as the child continues to play symbolically, adaptive strategies are also used as part of an overall coping effort to master these problematic scenarios.

Play activity is an avenue for expressing feelings and thoughts without fear of reprisal or irreversible outcome. The realm of play activity introduces an "as if" quality, allowing for freedom of imagination and trial efforts toward mastery (Winnicott, 1971; Fonagy and Target, 1998). This was also shown in the ergodicity of the system indicative of the use the play field as a free space to bring to front internal states uncommonly expressed in usual relationships and provide an opportunity to manage them. In fact, prior studies have shown that the mechanism of play therapy in facilitates mastery through re-enactment of stressful experiences (Singer and Singer, 1990; Gaensbauer and Siegel, 1995; Russ, 2004). Another implication of the child's oscillations between Clusters 2 and 6 is that Adaptive Profile rarely exist independently of other strategies. In cases where conflict is too

much to bear, a defense mechanism may help the child cope, by dividing an emotionally difficult situation into manageable parts or suppressing the excessive threat and helping the child focus on what can be mastered (Chazan, 2002).

The second research question was whether there is emergence of new and more functional organizations of CPTI play profiles in the second phase of the treatment. In these three therapies, a definitive reorganization of the children's internal world was not observed. Instead, in the final stage of the year, there was an initial phase modification of previously dysfunctional states. This latest process concerned the decrease of Clusters 7 and 6 for patients 2 (Esin) and 3 (Canan) respectively. Patient 1 (Rengin) instead did not show any changing trend in terms of clusters but showed a decrease in the number of interruptions in play in the second half of treatment. As mentioned before, Cluster 6 has to do with inhibition and conflict associated with issues having to do with separation and danger that the child cannot resolve. Cluster 7, though having significant adaptive qualities, also has relatively dominant impulsive strategies associated with sensori-motor play where feelings, especially anger are expressed through movement and activity. The decrease in both clusters is showing the beginning of the modification of more dysfunctional profiles (i.e., Inhibited and Impulsive Profiles). Patient 1 (Rengin) seems "delayed" in comparison to the others, still dealing with the problem of placing and experiencing some internal states (probably painful) in the play space without observable modification. This is also underlined by Patient 1's higher percentage of non-play segments (30%) in comparison to Patient 2 (24%) and 3(24%) over the course of treatment, possibly indicating her difficulty in experiencing and managing conflictual internal states in play. However, the decrease in interruptions during play over the course of the second half of treatment is an index of the growth in child's capacity to play unobtrusively (Chazan, 2000, 2001, 2002). The decrease in play interruptions is indicative of play that is satisfying and fulfilling and experienced by the child as pleasurable and affords her the opportunity to express a variety of affects (Chazan, 2002). These are all positive prognostic signs that Patient 1 has started to contain and regulate her conflicts and associated affects within the psychotherapeutic play field. It is possible that continuing the psychotherapy would afford new patterns of psychic states to come to the surface.

Our third research question was to explore the indices predicting the good outcome of these cases. In these three treatments, our analyses show that symptomatic improvement has to do primarily with the ergodicity of the therapeutic system. When psychotherapy becomes ergodic, the patients are able to bring different aspects of troubling internal states as well as a wide repertoire of coping mechanisms to treatment and test their effectiveness in the play space. This finding parallels recent developments in psychodynamic play literature that has de-emphasized the role of interpretation as a curative factor and instead focused on broadening the child's self-experience by increasing the range, depth and emotional richness of play (Target et al., 2005). The task of the therapist then is primarily to help the child play and support the child by facilitating a coherent narrative in play, help imagine the inner lives of the play

characters and work out conflictual emotional scenarios (Target et al., 2005). Our findings support that this is a necessary step toward the modification of some dysfunctional and/or painful patterns. We were able to witness the initial stages of this process in the reduction of Clusters 6 and 7 having to do with more Inhibited and Impulsive strategies.

Implications for Psychodynamic Play Therapy Research

Even though there is substantial evidence that play based therapies produce significant change the specific links between play processes and treatment outcome remain unexamined (Shirk and Burwell, 2010). However, many psychotherapists report that in order to deliver more effective therapies the curative factors in play need to be empirically identified (Kazdin, 2003). Our findings support and bring additional findings on the central role of play in psychodynamic treatment process. The initial findings having to do with the predominance of the Inhibited Profile is in line with literature that shows that anxious children have difficulty engaging readily in play (Christian et al., 2011). They tend to remain centered upon themselves and bring solitary representations to the play field (Barnett and Storm, 1981) which are all captured under the items loading toward Inhibited Profile. However, our findings suggest that the treatment affords them the opportunity to assume a different role, other than their own, and proceed to activity in terms of reciprocal interactions as shown in the decrease in Inhibited Profile and the expression of Adaptive characteristics captured by Cluster 2. The oscillations between inhibition and adaptation parallel Chazan's (2002) findings who showed that children still continue to use less adaptive strategies at the end of the treatment, however, these mechanisms become counterbalanced, and appear in more adaptive, sublimated, playful ways.

In terms of the mechanisms of change, our findings point to the importance of oscillations between different states (as shown in the oscillations between States 6 and 2) and the ergodicity of the system which give the patient the possibility and flexibility to move between different states at any given point. These oscillations afford the child the opportunity to try out new strategies, revert to old ones when their stress is too high which help restore stability toward generating something new. This in line with principles of complex systems that oscillate between disorder and order, instability and the self-regulating processes that restore stability. It is only after disorganization, oscillations and recurrence of previous states that the system generates something new in the psychotherapeutic space (Tyson, 2005; Galatzer-Levy, 2009). Even though we have not seen a definitive reorganization toward a new profile in our data, the decrease in play interruptions as well as the use of less adaptive profiles (Inhibited and Impulsive) are indicative of early phases of change. In fact, Chazan (2002) in her study with an inhibited boy found most significant change in time spent in play activity and in the reduction of Impulsive strategies. Initial session showed the child's inability to sustain play activity, characterized by play segments of short duration, with the child going in and out of play activity frequently. The proportion of total time spent in play during the session was low, and the time spent

in non-play was high. As treatment progressed, play activity segments increased in duration and the sessions flowed more smoothly, with fewer moves in and out of play and more time spent in play activity. At the end of treatment, the child showed no impulsive strategies, however, still showed significant Inhibited characteristics which were counterbalanced by adaptive strategies.

In terms of limitations, even though longitudinal studies of single cases are ideal to study the psychoanalytic process in depth, there is an issue with generalizing from a single case. Furthermore, it is important to underline the small number of time points pertaining to our three time series as a reasonable explanation for the lack of statistically significant odds ratios. An improved methodology would be based on a repeated single case design, preferably with more time points, involving relatively large sample of treatments for adequate comparison. Moreover, the use of outcome measures was limited in frequency and did not permit some statistical analyses that would be able to relate these measures to the CPTI. The intensive use of outcome measures, linked to the process measures, may bring further light to the psychodynamic play therapy process with children. Another limitation is that this study focused on the child's use of the play space, however, we were not able to account for the therapists' effects. Future studies can also apply other measures of process such as the Child Psychotherapy Q-Set (CPQ; Schneider et al., 2009) in order to understand core therapist factors and therapeutic interaction that aid in the emergence and development of play profiles. We also suggest that future studies could analyze play profiles of children with different ages, different pathologies, and different theoretical approaches which could yield different results pertaining to change processes.

Given the small sample size, and the limited ability to generalize findings, this study sought to put forth an initial empirical model that could be used to deepen our understanding of salient forces in psychodynamic play therapy in an innovative way. This was the first study of its kind to use CPTI with non-linear methods to systematically track play profiles in the therapeutic process, and analyzing their emergence and development. Approaching play processes as a multi-leveled phenomenon and categorizing the progression of different play profiles in psychodynamic psychotherapy can be used as a lens to study core processes of change. The methodology employed showed the productivity of treating psychodynamic play therapy as a complex system, taking advantage of a sophisticated outlook to study the process of play activity in treatment.

AUTHOR CONTRIBUTIONS

SH: Study conception and design, Acquisition of data, Interpretation of data, Drafting of manuscript, Finalizing Manuscript. AC: Study conception and design, Analysis and interpretation of data, Drafting of manuscript. FO: Analysis and interpretation of data, Drafting of manuscript. GS: Analysis and interpretation of data, Drafting of manuscript. SA: Analysis

and interpretation of data, Drafting of manuscript. AG: Analysis and interpretation of data, Drafting of manuscript. GF: Study conception and design, Analysis and Interpretation of data, Drafting of manuscript, Finalizing Manuscript.

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Psychotherapy with a 3-Year-Old Child: The Role of Play in the Unfolding Process

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Few studies have investigated the outcomes and process of psychodynamic psychotherapies with children. Among the limited number of studies, some only paid attention to play and verbal production, as they are fundamental aspects in assessing the psychotherapy process. This paper focuses on an empirical investigation of a 3-year, once-a-week psychodynamic psychotherapy carried out with a 3-year-old girl. A process-outcome design was implemented to evaluate play and verbal discourse in in the initial, middle, and final parts of 30 psychotherapy sessions. Repeated measurements of standardized play categories (the Play Category System and the Affect in Play Scale—Preschool version) and verbal discourse (Verbal Production) were analyzed. To increase the clinical validity of the study, data from the assessment phase and vignettes from the sessions were reported to deepen the patient's picture during the unfolding therapy process. Parent reports before and after the therapy were also included. Empirically measured changes in play and verbal production were fundamental in evaluating the young patient's psychotherapy process. Verbal production and discourse ability progressively increased and took the place of play, which instead became more symbolic. Developmental issues as well as psychotherapy's influence on the patient's change, were discussed in relation to the role of play in enhancing the development of verbal dialog and the expression of the child's emotions, needs, and desires.

Keywords: psychodynamic psychotherapy, single case study, process-outcome research, child, play, verbal productivity

INTRODUCTION

Recently, increasing interest has been devoted to the assessment of "operationally defined" markers of the psychodynamic psychotherapy process to alleviate children's distress (Delgado, 2008), underlining the importance of introducing well-validated and standardized research instruments to study clinical processes (Midgley and Kennedy, 2011; Yanof, 2013). The empirical support for psychodynamic psychotherapy with children has been limited as compared with adults (Abbass et al., 2013); few studies have focused on the outcomes and process of psychodynamic psychotherapy with children, and just a small number of them have paid attention to methodological issues (Weisz and Hawley, 2002; Kennedy, 2004), including mixed empirical evidence (Abbass et al., 2013).

In psychodynamic psychotherapy for children, the emphasis is not only placed on verbal communication but also on non-verbal communication, by considering the child's developmental level to facilitate therapeutic relationships throughout the play, drawing and dialog (Shirk and Karver, 2003; Kernberg et al., 2012). The development of play

is an important milestone in childhood. Play holds a crucial role in providing a safe, caring, protective, confidential, and containing space where children can recreate themselves and their painful experiences through a process of self-cure (Winnicott, 1942; Erikson, 1963; Landreth, 2002; Bratton et al., 2005; Campbell and Knoetze, 2010). Pretend play is the best way of expressing thoughts and emotions (Kernberg et al., 1998; Halfon et al., 2016) as well as mitigating fears and anxieties (Harris, 2000; Russ, 2004; Yanof, 2013). It is characterized by the use of fantasy, a level of organization and a standard of comfort (Russ, 2004; Yanof, 2013). Fantasy is the process of make-believe, an essential behavior the child engages in during pretend play; organization helps the child to structure pretend play into a story and to utilize cause-and-effect thinking; and comfort is used to assess the ease and pleasure in the engagement in play.

All of these milestones make it easy to understand why play has been considered a preferential way of exploring the inner world of child psychoanalytic therapy since the 1930s, when Melanie Klein and Anna Freud used play techniques to help their young (not fluently speaking) clients to express thoughts, emotions, and feelings. Starting from these beginnings, play has been considered as (a) the primary expressive medium in child psychotherapy to hold meaningful therapeutic value (Bratton et al., 2005; Barish, 2009; Campbell and Knoetze, 2010), (b) a natural co-constructed means of communication between the child and the therapist, and (c) an useful therapeutic technique to help the child work through different meanings and managing stressful emotions (Russ, 2004; Yanof, 2013).

Similar to pretend play, drawing and verbal communication are natural childhood manners of expression, which provides a space where children can feel comfortable (Brems, 2008; Midgley et al., 2009; Pace et al., 2015; Capella et al., 2016). Verbal production, finally, has an important role in assessing the psychological/mentalistic lexicon formed by terms referring to mental states. Its appearance is considered an important indicator of early understanding of mind as well as one's and others' internal worlds, and a precursor of subsequent meta-representational capacity (Bartsch and Wellman, 1995; Baumgartner et al., 2000; Ornaghi et al., 2010). Longitudinal studies suggest that in non-clinical children from the age of 2, the child should be able to use a mentalistic lexicon when referring to perception, complex feelings, and social emotions. At around 3 years, a cognitive psychological lexicon appears concerning internal states related to beliefs, wishes and imagination (Ornaghi et al., 2010).

The principal aim of this paper is to investigate therapeutic change in play, using operationalized and validated measure systems, and to explore its relationship with drawing and dialog in a psycho-dynamically oriented psychotherapy with a 3-year-old girl. Play, drawing and verbal production were fundamental aspects in assessing the therapeutic change. Improvements in psychological complexity and representational skills in terms of symbolic play were expected, given their importance to children of the patient's age and to the sophistication of verbal skills (Fein, 1987).

The present work was an observational study, corresponding to a level-5 study following the hierarchy of evidence provided by Midgley and Kennedy (2011); it provides a detailed discussion of a clinical single case using a process-outcome design. Its aim is to analyze the change during the psychotherapy, using outcome measures to provide a general view on the patient's functioning through comparison between the assessment phase and the outcome evaluation. In order to provide more robust testing, different types of instruments were used in the assessment and outcome phases, with each one revealing different aspects of specific constructs (Cheng, 2001).

Improvements in play measured during spontaneous play moments and in drawing and dialog within the therapeutic sessions were hypothesized to support more accurate competencies in managing, naming and modulating emotions as well as in talking about "self-inner states." Moreover, since the positive effect of children's involvement in non-verbal activities on the verbal expression of inner dialog, measured by verbal production, was expected to progressively increase during therapy and progressively substitute the massive use of play and other activities (e.g., van Nijnatten and van Doorn, 2013). A multimethod approach was used to gain incremental clinical validity in understanding the case.

The following paragraph first includes the patient's – Sarah – referral by her parents and the therapy aims. Then, the instruments and results of play are presented to compare three phases of the treatment. The analysis shifts to measures of play and verbal expression and to therapeutic change during the different stages of the psychotherapy (T1, T2, and T3). Finally, conclusions are drawn to take stock of Sarah's case to integrate the outcomes with the change during the therapy.

MATERIALS AND METHODS

Psychotherapy was held in the clinical centre of the University of Padova. Following the service of good practices and the Italian law about privacy and data confidentiality (n°196/03), written and informed parental consent was asked and obtained for video and audio sessions recording, as well as for the participation in the research.

The treatment lasted 3 years and consisted of 55 once-a-week sessions, which were audio-recorded and fully transcribed with the parents' informed consent. In the present work, 30 sessions were scored and analyzed: 10 from the first phase (T1), 10 from the central phase (T2), and 10 from the last phase (T3) of therapy. Therapy was held by a female therapist in training who received weekly supervision from highly competent clinicians at the University clinical centre. During the assessment and outcome phases, the Affect in Play Scale—Preschool version (APS-P; Russ, 2004) was administered to Sarah at the beginning of, about halfway through and at the very end of the therapy, respectively, to assess her cognitive and emotional expression and to observe her level of pretend play.

THE CASE OF SARAH

Sarah was a 3-year-old Italian child who was referred by her parents. Sarah came from an intact family with middle

socioeconomic status. Her mother had graduated and worked as an employer; her father was a teacher at an elementary school. They came from intact families and did not report any specific traumatic events in their life.

One year before the present referral, Sarah, at the age of two, was referred by her parents for speech difficulties, oppositional behavior and sleep problems. During that occasion, only parenting support and advice were offered to help the parents better understand and manage Sarah's difficulties.

One year later, Sarah's parents re-contacted the centre asking for help because Sarah's symptoms were back and because they complained about deterioration in some areas. First, the therapist met Sarah's parents again, without the child, to assess how they perceived her daughter and their functioning toward the child, and the therapist adjourned the child's anamnestic history. Sarah's parents were particularly worried about their little daughter. Regarding Sarah's language impairment, the parents reported Sarah's decrease in verbal ability (stuttering, changing letters in words and difficulties with naming objects) along with a general regression to baby talk. Sarah's oppositional behavior had also relapsed, as Sarah often seemed upset and had tantrums. In these situations, Sarah's parents felt that they were unable to calm down and relax Sarah, and they felt distressed, powerless, and inadequate. Moreover, they reported a regression in several of Sarah's competencies, concerning feeding (she wanted her mother to feed her), social inhibition (Sarah looked more isolated and less interested in her peers than before) and aspects of separation anxiety (she needed her parents to play with and stay next to her most of the time). A psychodynamic assessment was done using Anna Freud's developmental lines. In particular, difficulties and regressions were found in many developmental lines at the beginning of the therapy. Following "from dependency to emotional self-reliance and adult object relationships," Sarah showed a regression to a more dependent phase of life and was unable to stay alone even for few minutes to play or draw, and always asked for her mother's presence (regression in the line from the Body to the Toy and from Play to Work). At the preschool, she asked for the teacher's company and showed more difficulties in behaving and playing with other children (regression in the line from Egocentricity to Companionship). She had previously developed the ability to eat using a spoon and a fork, but at the moment of the assessment, she seemed unable to eat alone and was always asking for maternal care and help; in this case, a strong regression in the developmental line "From Suckling to Rational Eating" was found. At the same time, at the age of three, she had begun to wash her face, prefer and choose her clothes and try to dress alone, but at the moment of assessment, her regressive behavior showed she was unable to do anything in autonomy (From Irresponsibility to Responsibility in Body Management).

The therapist observed that the parents were only able to report negative descriptions when talking about their little girl. There was no pleasure or positive affection to share about their daughter. To the therapist, they appeared quite rigid, anxious about the adequacy of Sarah's behaviors and requests, and to not always be able to understand or support Sarah's developmental needs or understand their child in connection with her real age and developmental stage. They tended to consider their daughter as a "little adult" whose behaviors were too "childish." Typically, their interactions with Sarah were about normative conduct: "You are a grown-up girl. Help yourself. Behave yourself. Keep sitting in a good manner." The interactions surrounding the play were like, "You are playing too much; now, try to draw something nice for your mom."

During the assessment phase, Sarah showed the impairment her parents had declared, highlighting a state of emotional distress and a sense of emptiness and loneliness. She looked sad, showed poor facial expressions, showed no interest in exploring the room or in playing with toys and did not talk to the therapist. However, she was able to stay alone and was eager to stay with the therapist and to follow her suggestions for interaction. According to the therapist, Sarah showed a disposition (according to her young age) to "use" the therapeutic space and the therapeutic relationship for her developmental issues, and to use the therapist as a "real relational object" to identify and interact with. She absolutely needed her own space (the therapy) to find a new model of relationship in which to express her developmental needs and emotions, without rigid requests of adjustment to be a well-behaved "grown-up girl."

The therapist thought about what would be the best way to help this family, especially Sarah, and decided to offer a parallel path: to continue working with parents and, at the same time, to offer personal individual treatment to Sarah. The latter was motivated by Sarah's psychodynamic assessment, which highlighted both Sarah's indication for psychological support (symptoms and regressions) and quite a stable sense of self to gain better adjustment throughout individual psychoanalytic "developmental help," as suggested in psychoanalytic training schools for children aged 3 to 5 years old (pre-latency cases). This double therapeutic intervention was accepted by the parents, and they started to have regular meetings twice a month and to support a weekly individual treatment with their child.

The aim of working with Sarah's parents was to help Sarah's parents to support their parenting function during Sarah's therapy. The therapist worked hard to create and improve on her strong working alliance with Sarah's parents, never making them feel inadequate while at the same time increasing their parenthood abilities to give meaning to Sarah's behaviors and to keep her needs in mind (also telling them specific vignettes about what Sarah was doing in therapy and connecting the vignettes with Sarah's behavior they reported at home), to help Sarah reach better adjustment and wellbeing. The therapeutic goals for Sarah focused on behavioral regulation, decreasing inhibition and separation anxiety symptoms as well as modulating her oppositional behavior and increasing her emotional expression. The therapy was also aimed at helping Sarah to acquire relational skills and interest in others to allow her to face new situations more adequately. As in every psychodynamically oriented psychotherapy, the therapeutic relationship played a basic role in the therapy process; play and dialog were used to support the quality of the therapeutic relationships and motivation as well as to reach the therapy goals.

This paper focused on the specificity of the child's treatment.

Procedure

The present work includes: (a) a comparison of psychological assessments and therapy outcomes through the Affect in Play Scale—Preschool version, which was administered in line with its standardized procedure (APS-P; Russ, 2004); (b) a descriptive analysis about how periods devoted to drawing, playing and dialog changed during the unfolding of the therapy; and (c) a therapeutic change analysis along three therapy sessions, revealed by measures of verbal expression and play and applied on spontaneous play during the sessions. Play was assessed with the adaptations of APS-P and the Bornstein Play Category System at the initial, central, and final phases of selected therapy sessions. Frequencies and type of verbs referring to the state of being, behavior and state of mind were applied as measures of psychological/mentalistic lexicon during each of the 30 sessions, as suggested by Camaioni et al. (1998).

Tools Description

Affect in Play Scale-Preschool version (APS-P; Russ, 2004). The APS-P (Russ, 2004; Kaugars and Russ, 2009) is a semi-structured, empirically validated, individually administered 5-min play task that assesses affective and cognitive dimensions of play (Russ, 2004). Standardized instructions and scoring were provided. The child was invited to play with a set of plastic and stuffed toys, including animals (bear, shark) and objects (car, small cups, a "hairy" rubber ball) intended to elicit a range of emotional expressions such as aggression (e.g., a shark). With regard to cognitive scores, organization assesses the quality, complexity, and coherence of the play narrative, with scores ranging from (1) unrelated events, no cause and effect, to (5) integrated plot with a beginning, a middle part and a conclusion. Elaboration refers to the variety and complexity of elements used in the story themes, such as facial expressions, sound effects and characters' development, from (1) very few details and simple themes with no embellishment, to (5) much embellishment across many dimensions such as details, sound and voice effects and facial expressions. Imagination assesses fantasy and the number of transformations (e.g., using one thing as another) in the play, ranging from (1) no symbolism, no fantasy, to (5) many transformations and fantasy themes. Comfort measures the child's ability to get involved in the play task and his or her enjoyment of the play, ranging from (1) reticent, distressed, to (5) very involved and enjoying the play. The expression of affects was coded as regarding the Frequency of Affect Expression, which was used during the play session. Affect is scored when an affect theme is expressed in the play. Affect scores can be positive (e.g., nurturance/affection) or negative (e.g., aggression), and they can be summed to form the total affect.

An adaptation of the APS-P using the toys available in the therapy room was used to assess therapeutic change during the therapy by measuring cognitive and affective variables in the spontaneous play in terms of presence and quality (positive or negative) of affect expression as well as the cognitive level of play organization, elaboration, imagination, and

comfort. The scores on the APS-P in its regular and adapted use in clinical sessions were calculated by two independent judges – the therapist and a Ph.D. student who were both trained in the APS-P and were blind about which phase the sessions were from. The agreement between the two judges was satisfactory.

An adaptation of the Bornstein Play Category System (PCS; Bornstein and O'Reilly, 1993; Bornstein, 2007) was used to assess Sarah's spontaneous play with toys like a dollhouse, a camping tent, and cups, all of which were available in the therapy room. According to this system, play levels are empirically devised to detect the progressive nature of play across the first years of life. Levels 1–4 includes categories of exploratory play, while Levels 5–8 includes categories of symbolic play. A brief description of the levels is reported in **Table 1**. The play was coded from videotapes in accordance with the mutually exclusive and exhaustive eight play category levels and a default (no-play) category for each level, and the absolute frequency was calculated. The PCS looked likely to represent a useful instrument in assessing Sarah's play because Sarah's level of symbolic play seemed to be scarce at the beginning of therapy, compared to children of her age, and the PCS can give a more detailed evaluation regarding levels of play, from exploratory to symbolic levels. The play categories were assessed in Sarah's spontaneous play during therapeutic sessions, considering separately the initial, central, and final phases of therapy.

Verbal Production

Every language includes very different types of words; of specific interest are words conveying emotions, feelings, wishes, thoughts, and beliefs, all of which are included in what is defined as the psychological lexicon, which is formed by terms referring to mental states. Its appearance in children around 3 years old is considered an important indicator of early understanding of the mind as well as one's and others' internal worlds as well as a precursor of the subsequent meta-representational capacity (Bartsch and Wellman, 1995; Baumgartner et al., 2000; Ornaghi et al., 2010). To empirically identify this developmental progression toward a psychological/mentalistic lexicon, following Camaioni et al. (1998), verbal production was classified into three categories referring to the acquisition of an increased psychological complexity: (a) state verbs, which are verbal forms that do not refer to mental states such as "there is, there are"; (b) behavior verbs, which are verbal forms that express concrete actions such as eat, walk and read; and (c) mental verbs, which are verbal forms that include all verbal expressions that are more connected with the cognitive and emotional components of thoughts in both positive and negative terms – they not only include feelings and thoughts but also volition states, moral judgments and acknowledgments of abilities. Two blind judges independently scored the test, and the inter-rater reliability was satisfactory.

Data Analysis

The percentages of time devoted to playing, dialog or drawing/other activities were monitored in each session, namely at T1, T2, and T3, to evidence the differing quality of

| Borstein Play Category System	T1		T2		T3		F	p	Post hoc
	M	DS	M	DS	M	DS			
Unique functional activities	3.00	4.19	0	0	0	0	–	–	–
Inappropriate combined activities	0	0	0	0	0	0	–	–	–
Appropriate combined activities	2.30	3.97	2.20	4.57	1.40	4.43	0.48	0.62	–
Transitional play	2.50	5.32	0	0	0	0	–	–	–
Symbolization of the self	3.10	3.67	0	0	0	0	–	–	–
Symbolization of others	6.90	10.26	0	0	0.50	0.71	–	–	–
Symbolization sequence	6.00	6.59	8.80	12.20	9.90	8.02	3.60	<0.05	T3 = T2 > T1
Symbolization replacement	1.80	2.53	4.20	5.65	5.90	5.35	3.70	<0.01	T3 > T2 > T1
Adaptation of Russ APS-P									
Organization	1.00	0.98	1.00	1.05	3.00	1.41	4.20	<0.05	T3 > T1 = T2
Elaboration	1.00	0.76	1.00	0.79	2.00	1.02	2.43	0.13	–
Imagination	1.00	0.89	2.00	0.78	3.00	0.95	4.00	<0.05	T3 > T2 > T1
Comfort	1.00	1.03	2.00	0.09	3.00	0.87	4.01	<0.05	T3 > T2 > T1
Positive affective expression	70.80	23.04	78.70	36.71	65.47	31.46	2.61	0.09	–
Negative affective expression	33.70	21.75	72.40	40.35	47.27	32.38	6.13	<0.01	T2 > T1 = T3
Total affective expression	121.70	42.04	199.30	86.93	121.80	51.61	5.016	<0.05	T2 > T1 = T3
Camaioni – Verb development									
Behavior	107.8	48.28	140.3	65.02	180.3	54.32	3.65	<0.05	T3 > T2 = T1
State of Mind	38.6	20.14	84.2	47.39	105.7	48.23	6.13	<0.01	T3 > T2 > T1
State of Being	34.5	19.15	56.3	36.10	76.9	49.65	2.62	0.09	–

activities that unfolded during the therapeutic session over time. Descriptive statistics and MANOVA for repeated measures were used to analyze the results, with respect with therapeutic change during the three periods, focusing on the quality of spontaneous play in terms of cognitive, affective, and concrete/symbolic modalities of expression. Visual graphics were reported for significant variable changes, specifically assessment and outcome changes as well as the changes within T1, T2, and T3.

FIGURE 1 | Mean, APS-P cognitive and affect scores at assessment and outcome.

RESULTS

Comparison between Assessment and Outcome Scores

According to the APS-P, cognitive expression improved from the assessment to the outcome (**Table 1**; **Figure 1**). Cognitive expression in play was also assessed by comparing Sarah's results with normative scores of the Italian sample (children between 4 and 5 years; Mazzeschi et al., 2016). The Assessment scores were between the 30th and 40th percentiles. The outcome scores increased, reflecting relevant improvements in cognitive functioning. Elaboration and comfort increased through the third quartile (60th and 70th percentiles, respectively), while the organization and imagination scores increased even through the fourth quartile (90th and 95th, respectively), thus reflecting higher scores compared to those of normative sample.

Sarah's APS-P affect scores were also assessed (**Table 1**; **Figure 1**), by comparing Sarah's results with normative scores of the Italian sample (children between 4 and 5 years; Mazzeschi et al., 2016). Sarah's assessment scores were very low – within
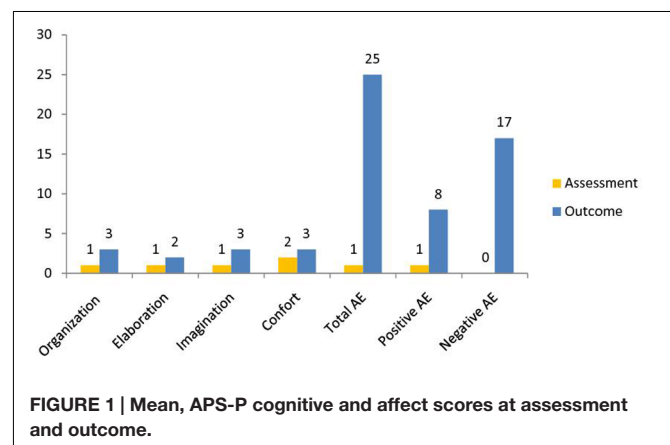
the first quartile (between the 10th and 20th percentiles). However, Sarah's scores increased after therapy, reflecting relevant improvements in her emotional understanding and expression.

Below are examples of Sarah's verbalizations during the APS-P in T1 and T3:

> T1: *The animals are doing things. They eat.*
> T3: *The shark would like to bite the animals. They are very worried. They need help from Daddy.*

Total affect increased, going up through the fourth quartile (80th). More specifically, Sarah's positive affect score was around the median (60th percentile), while her negative affect score was

within the fourth quartile (95th percentile), thus reflecting higher scores compared to those of normative sample.

Change in the Measures of Play and Verbal Discourse in the Different Psychotherapy Periods

In order to analyze Sarah's activities during her therapy sessions, three categories were separately counted in terms of "time" dedicated to: (a) play, in terms of Sarah's verbal and non-verbal expression during play with toys, using an adaptation of APS-P; (b) dialog, or Sarah's speech during activities that were different from play; and (c) drawing/other activities, such as book reading and storytelling. Play, dialog and drawing/other activities were measured as percentages regarding the three considered therapeutic periods (T1, T2, and T3). More specifically, drawing/other activities and dialog progressively became more frequent during sessions with Sarah, whereas play decreased (**Table 1**; **Figure 2**).

Mean play sophistication, as assessed by the adaptation of the Bornstein Play Category System from Sarah's play with toys, improved from T1 to T3 (**Table 1**; **Figure 3**). Immature components of play, like functional activities, were replaced by more mature categories, like symbolization sequence and replacement, which started to increase significantly from the beginning to the third period of therapy. For example:

> T1: "Here, you are an elephant...he is gray...big...he eats something. I do not know...here, there is nothing to eat."

> T3: Mom, Dog and his son go for a walk. They go to the swimming pool (she indicates a blue piece of wood)...They have a lot of fun; the little dog was happy."

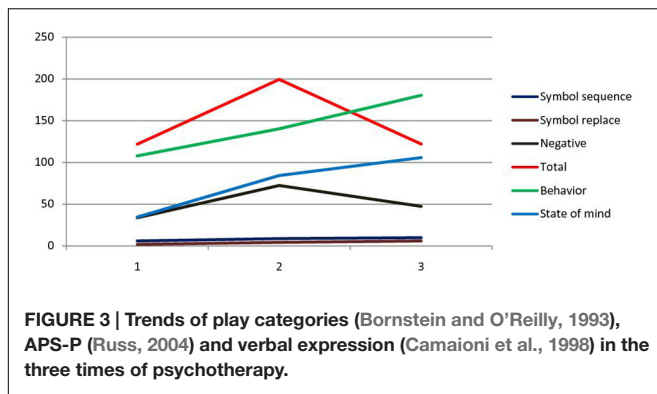The means and standard deviations of the cognitive variable scores, assessed by the adaptation of APS-P Sarah's play with toys, are shown in **Table 1**. Sarah's cognitive scores, organization, imagination and feeling of comfort increased significantly from T1 to T3 of the therapy. With respect to affect expression assessed with APS-P during play, the means and standard deviation are presented in **Table 1**. At a qualitative level, aggression, happiness, oral and frustration were the most common affective categories in Sarah's dialog. Total and negative affective expression increased from T1 to T2 and then decreased until the end of treatment (**Figure 3**). In the middle of therapy, due to therapeutic holding, Sarah felt more and more comfortable in expressing negative emotional states, feeling sure about finding acceptance and elaboration. This allowed Sarah to express her negative affect, probably associated with her parents' failure to provide an adequate holding environment.

See a verbalization in T2:

> T2: "This giraffe is very angry...because her friend asks her to run very fast...but she is just a little giraffe...!

The verbs most frequently used in Sarah's dialog were those referring to behavior (Camaioni et al., 1998), followed by verbs regarding state of mind and state of being (**Table 1**; **Figure 3**). Both behavior and state of mind verbs increased significantly from T1 to T3, reflecting Sarah's improving capacity to behave concretely and to report her inner mental states.

FIGURE 2 | Play, dialogue and drawing/other activities in T1, T2, and T3.

FIGURE 3 | Trends of play categories (Bornstein and O'Reilly, 1993), APS-P (Russ, 2004) and verbal expression (Camaioni et al., 1998) in the three times of psychotherapy.
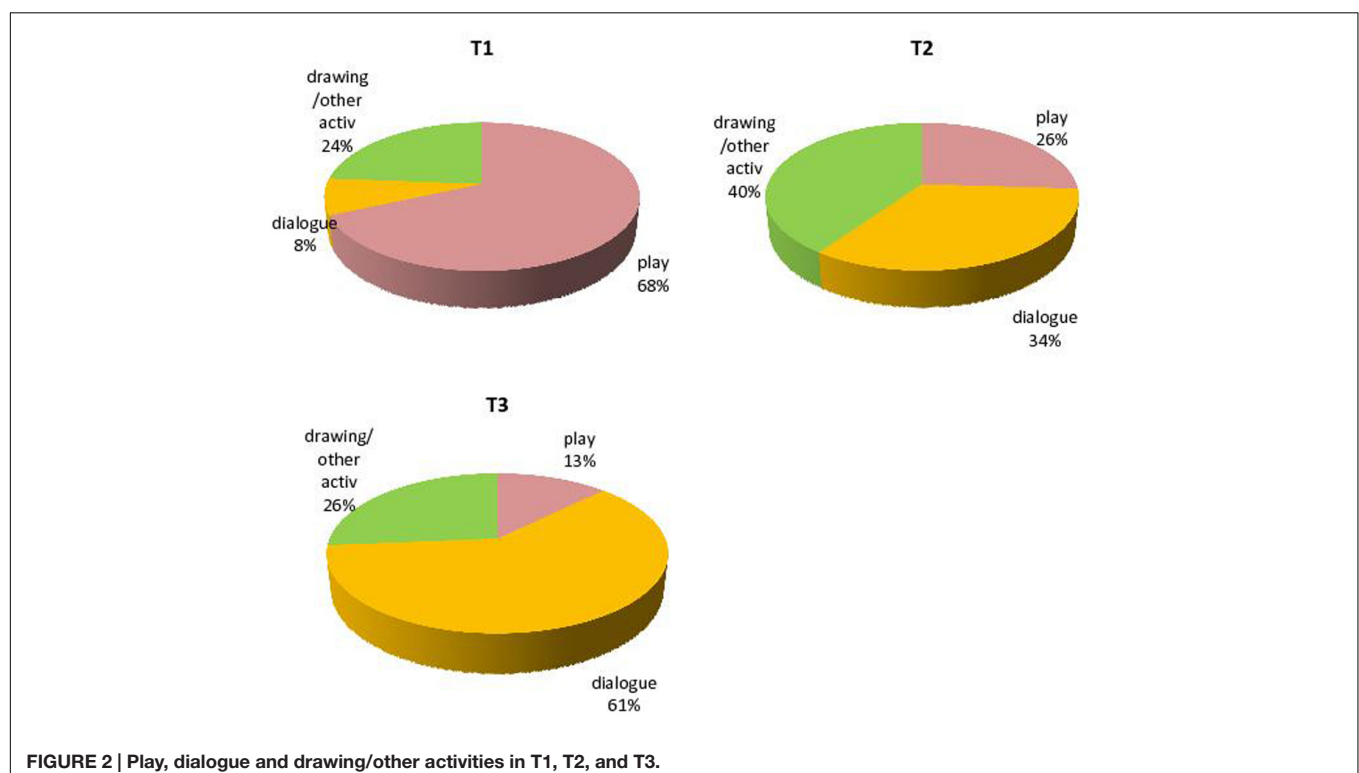
CONCLUSION

At the end of the therapy, another developmental evaluation was done using Anna Freud's developmental lines. Sarah reached normal development in all of the developmental dimensions that were compromised at the beginning of the therapy. The present work analyzed a good treatment outcome in a 3-year-old child, in terms of symbolic play changes. At the beginning of therapy, Sarah was not comfortable with play; thus, during T1, the therapist aimed to make Sarah feel more comfortable with playing in the therapy room. With children who are not able to play, the therapist's goal is to help them use play as a means of self-expression and as a way of create meaning in the presence of another (Yanof, 2013). T2 represented an important phase in Sarah's treatment. This is probably due to her acquisition of higher comfort in therapy. Due to the therapy, Sarah's play progressively improved from exploratory to symbolic play. Moreover, Sarah's affect expression increased, particularly negative emotions, which did not disappear but strongly decreased in the middle and then re-increased at the very end of the therapy. More important than the quantitative characteristics are the qualitative characteristics of this trend, which seem important from a clinical point of view. Sarah learned to explore and affirm the expression of her negative affect in the therapeutic setting, increasing the "bad feelings" in the middle of the clinical work. Then, she learned to manage and cope with such emotional expressions: the quantity decreased, but more importantly, the quality of the negative affect became more "workable," and Sarah was more prone to explore and elaborate upon these feelings in her play. Progressively, Sarah expressed aggressive affects through fantasy and cognitive elaboration, which allowed an adequate expression of aggressive emotions in much more of a holding setting like the therapeutic one that, in contrast with her parents, recognized her developmental gains. This was confirmed by Sarah's assessment/outcome results on the APS-P scores: the percentiles showed that Sarah's results were not in the normative range for her age at the assessment phase, but at the end of the treatment, the percentiles showed that Sarah had reached the range of normal development in symbolic play. This positive psychotherapy outcome was also confirmed in the analysis of Anna Freud's developmental line at the end of the therapy: Sarah was less disharmonic that was in line with the

developmental stage she was in. The results shed light on further investigation about the process of change.

Play had a core role in this psychotherapy, by showing a link with affective expressions and verbal production. These findings are in line with Russ's (1993, 2004) theoretical model that proposes play as being strictly connected to both cognitive and affective domains. Through play (and dialog), Sarah learned to express and modulate her feelings when referring to a wider range of emotional patterns. Specifically, her play decreased in frequency, but its quality improved concerning symbolic thoughts, cognitive and affective contents and verbal expression. Lower frequency of play allowed Sarah's dialog to improve with regards to frequency and quality, such as supporting representation of mental states. Several scholars (Berk et al., 2006) have suggested that make-believe games are forerunners of the important capacity for forms of self-regulation, including reduced aggression, delayed gratification, civility and empathy. The improvement in verbs referring to states of mind reflects this acquisition. Higher levels of negative affect expression, compared to those positive affect, probably reflected Sarah's feelings of not being initially recognized by her parents, who initially only reported her episodes of tantrum and oppositional behaviors without revealing her positive developmental aspects. From a more qualitative viewpoint, psychotherapy revealed its utility in terms of the decrease in symptoms and the progressive development of cognitive and affective components in Sarah's functioning. The relationship between Sarah and her parents was very difficult in the first place. Her father and mother were not able to find pleasure in staying with their daughter, and they only reported negative descriptions and faults when talking about their daughter. However, at the end of therapy, Sarah's mother and father acknowledged Sarah's improvements, reporting that she showed fewer symptoms when she was at home, such as oppositional behavior.

The present study had some limits, therefore leaving some open questions. Since this is a single case study, the results cannot be generalized. The complexity examined is difficult to represent simply and briefly. The intervening outcomes may have appeared to be stronger if the researcher was more experienced. Finally, it cannot answer a large number of relevant and appropriate research questions (Hodkinson and Hodkinson, 2001), such as – specifically at developmental age – how the change is understandable in terms of psychotherapy's contribution or the effects of natural developmental issues. Moreover, changes in the drawing activities were not directly measured or evaluated in their changes, but just for their expression in the APS-P and verb categories. More important information could be added in future research with respect with changes in typical drawing dimensions, during the unfolding of the therapy. However, this particular single case with a very little girl could be considered original and ecological because it is grounded in "lived reality" of the therapeutic exchange with a little patient, where communication passed through non-verbal more than verbal communication. Moreover, the particular combination of Sarah's "developmental help" therapy and the "working with parents" intervention highlighted the importance of creating a working alliance web around the young patient's suffering. This kind

of work increased the effectiveness of the intervention. In this sense, the reduction in the child's symptoms appeared to be the consequence of the double support to both the parents' role and the child's development.

Focusing on play and verbal development, from more concrete to more symbolic, helps us picture the inner world of a patient with a – quite typical and even difficult – immature level of functioning, and understand complex inter-relationships among diagnosis, measures and their clinical application (Salcuni et al., 2015). As Hodkinson and Hodkinson (2001) suggested, a single case study can provide "provisional truths, in a Popperian sense," until contradictory findings or better theories are developed. Moreover, following a strong empirical approach to change through play and dialog change, this case can be considered useful to highlight the importance of an empirical approach to psychodynamic psychotherapy research with children.

ETHICS STATEMENT

We followed the procedure suggested in our Department, in line with the university local ethical committee, asking to both Sarah's

parents for their written informed consent, Sarah is a fictional name, and all information about the child and her parents that could make this family recognizable was modified. The Clinical Service in which the study was conducted, is a recognized research centre of our university (Interdepartmental Laboratories for Research and Applied Psychology, LIRIPAC); all the studies conducted on patients followed the LIRIPAC and Department ethical guideline and procedures, based on the Italian law about privacy and confidentiality (n° 196/03); research practice and ethical procedure were discussed with the Director of the Centre and approved before the research began.

AUTHORS CONTRIBUTIONS

SS followed the whole process of the manuscript, supervising it, and writing interpretative conclusions and discussion of the case report; AL supervised method and procedure: moreover, she supervised some years ago the therapist that took care of Sarah; DM wrote the introduction and, together with DDR, performed scoring of the clinical material and the data analysis and the table editing.

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The Intersubjective Nature of Play Development and Its Role in Child Psychoanalytic Psychotherapy

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Playing is a vital activity in childhood. It is important to psychological development, in both cognitive, emotional, and social dimensions. It has a core role to the young child's mental health. In the clinical setting, play has had an important function, enabling a way of communicating with the child, and a privileged way for creation of meanings and expression of feelings, affects, fears, angry, difficulties, etc. In this article, I highlight the intersubjective nature of play development, its impediments and its crucial role in child psychoanalytic psychotherapy.

FIRST DEVELOPMENTS IN CHILD PSYCHOANALYSIS AND THE USE OF PLAY

One of the pioneers of psychoanalysis with children was Melanie Klein. She introduced the use of play in the analytical process. More than that, she developed a theory which describes the importance of playing for ego development and the interplay between internal and external reality (Klein, 1930, 1932, 1955). According to Klein, children's object relations begin almost at birth, and arise with the first breastfeeding experience (Klein, 1955). The way the child experiences the external world is constantly influenced by—and influences—the internal world which is being developed. Envy and destructive impulses have an important role in her theory, especially primitive sadism (Klein, 1932), and the ego development occurs on the basis of these intense drives and conflicts.

The process of symbol-formation, which becomes possible when frustrating experiences and destructive impulses were not prominent, is a core achievement for ego development and mental health. Playing becomes possible when the child is able to symbolize, that is, displace his/her emotions, fears, and anxieties to other objects in the external world, not the primary objects (Klein, 1930). When playing, the child feels relief because he/she transfers fantasies, anger, anxiety and guilt to other objects that are not his/her primary caregivers. Klein stated that play and dreams share analogous means of representation, and in both there is a form of wish fulfillment. Play's specific content is identical to the core of the child's masturbatory fantasies, and one of its main functions would be to provide a discharge for these fantasies. The role of the analyst would be to interpret the fantasies and anxieties underlying the play or the inhibitions to play when they are present.

Winnicott (1971) followed Klein's steps in object relations approach, but he introduced new and important ideas to the understanding of child's play. According to Winnicott, we must think about playing as a thing in and of itself, overcoming the concepts of instinct sublimation and play as performing masturbatory fantasies. He postulated the existence of a potential space between the baby and the mother, where the play takes place. In early childhood, this intermediate area is necessary to start the relationship between the child and the world. Winnicott described the transitional phenomena and the importance of illusion for the child in this process. A good enough

mother is able to adapt almost completely to the initial needs of her baby. This gives the baby the illusion that there is an external reality corresponding to his/her own ability to create. It is essential that the mother survives to the baby's aggression to establish his illusory omnipotence. Besides, this almost complete adaptation should gradually decrease, and the following disappointment creates an intermediate area of experience, which is the area of play and, later, the arts, religion, imagination, and scientific work.

In sum, playing is a creative experience, which makes possible a sense of continuity in space and time for the baby and the discovery of self (Winnicott, 1971). Psychotherapy takes place in the overlap of two ludic areas, of the patient and of the therapist. Therefore, if the child cannot play, "then the work done by the therapist is directed towards bringing the patient from a state of not being able to play into a state of being able to play" (p. 38).

As we can see, the importance of the relationship between a child who plays and another person (the mother, a caregiver or the therapist, in the clinical context) soon began to be highlighted in psychoanalytical approaches. This leads us to consider the caregivers' role in developing the child's ability to play, as formulated by contributions from theoreticians of attachment and reflective function.

CONTRIBUTIONS FROM CONTEMPORARY THEORISTS OF ATTACHMENT APPROACH

Contemporary authors who followed the tradition of object relations theory and the latest contributions of attachment theory argue that the child's attachment bond with his/her parents serves mainly as self-organization and as an emotional regulation system (Fonagy et al., 2002). In this scenario, play has "a pivotal role in the developing of thinking as well as emotional experience, and particularly in their integration" (Fonagy and Target, 1996, p. 220).

According to Fonagy and Target (1996), the very young children (2–3 years old) present a dual character regarding their sense of inner reality. In the "psychic equivalence mode," ideas are direct replicas of reality, so that they are always true. They are not felt to be representations. For a small child, his/her inner experience is equivalent to and thus mirrors the external reality. In a similar manner, the other has the same experience. On the other hand, in the "pretend mode" ideas are felt to be representational, but their correspondence with reality is not examined.

In normal development (4–5 years old), the child integrates these two modes to achieve the stage of "mentalization," or "reflective mode," when mental states are experienced as representations. Furthermore, inner and outer reality can then be seen as linked (Fonagy and Target, 1996; Target and Fonagy, 1996; Fonagy et al., 2002). Mentalization "comes about the child's experience of his mental states being reflected on, prototypically through experience of secure play with a parent or older child, which facilitates integration of the pretend and the psychic equivalence modes, through an interpersonal process that is

perhaps an elaboration of the complex mirroring of the infant by the caregiver" (Fonagy et al., 2002, p. 57). In order to achieve this integration, three things are needed: child's mental states (feelings and thoughts) need to be represented in the object's mind; the frame represented by the object's perspective, generally reality-oriented; an adult or older child who "plays along," so that the child sees his/her fantasies or ideas represented in other's mind, re-introjects this and uses it as a representation of his/her own thinking (Fonagy and Target, 1996).

Tessier et al. (2016) found empirical evidence to support these conceptions. In a longitudinal study with sexually abused and non-abused children, they analyzed if children's capacity to engage in pretend play, to symbolize and to make play narratives was associated with later reflective functioning, and if play mediated early child sexual abuse and later mentalization. They found that children's capacity to elaborate and conclude play narratives predicted later mentalizing abilities. Interestingly, play predicted later mentalization regarding others, but not regarding self. As an explanation the authors stated that mentalization regarding self can be expected to be more closely related to the primary caregiver's interest in the child's subjectivity.

PLAY IN DIAGNOSIS AND THERAPEUTIC PROCESS

As we can see, the way of considering play in the psychoanalytic psychotherapy has changed since Klein's pioneer work. Despite the richness of her contributions, her theory maybe assumes a highly sophisticated mental apparatus from the beginning of psychological development, with too much emphasis on the destructive impulses and early oedipal and sexual fantasies. According to Klein, playing and its development seems like an individual activity, or basically depends on the individual and the intensity of his/her destructive impulses. The therapist's task would be to understand and to interpret the play's content and meaning to the unaware child.

Winnicott, on the other hand, values play beyond the need to discharge impulses and communicate conflicts. He stresses that the psychoanalyst must look at the playing child, moving on from the play content, exclusively.

To sum up, playing is an interpersonal activity, since its beginning. It involves the symbolic transformation of the reality and it requires the presence of the other, and a view to the other's mind to occur (Target and Fonagy, 1996). Moreover, even if children under 4 years old are able to symbolize, they do not have symbols for their thoughts, which means that they do not treat their thoughts as symbolic, representing rather than directly reflecting the objective reality. For the authors, a symbol would be a representation of a mental representation. Thus, children need the other (their caregivers in normal development or their therapist in a clinical setting) in order to achieve representation and understanding of mental states and inner reality.

Notwithstanding the importance of play in child psychotherapy, as child psychotherapists we know many

children who cannot play at all, or show a disorganized and chaotic play. I argue that with some children the work to be done is to develop their capacity to play, in the way described by Slade (1994), which matches with contemporary attachment and the reflective functioning approach. In terms of psychopathology, play being present and having a symbolic meaning would require that the conscious and the unconscious were clearly established and consolidated, and experiences that are reference had suffered repression. When a child lives in a disorganized emotional universe, experiencing the inner life as diffuse and unintegrated, not only his/her capacity to play will be impaired, but the use of verbal interpretations will be disruptive and lead to denial and further disorganization. Besides, when the therapist makes verbal interpretations, this places him/herself outside the play, what is quite different from playing with the child, and assumes that the child has the ability to reflect upon the play and his/her inner life.

When working with young or very disturbed children, the therapist must help to develop their capacity to play. By developing children's capacity to play, therapists will help them to create meaning, more than uncovering meaning (Slade, 1994). In other words, by means of play, children will discover what they feel, think and want, and what others feel and believe. As the caregiver would have done whenever possible, therapist and child build narratives about child's psychological reality. Slade highlights some functions of the play, which I consider core functions in the clinical setting: the development of a narrative, the integration of affect into the narrative, the contextualization of meaning making within an object relationship and the development of reflective self-function. Again, this process will only become possible and the child will represent internal experiences by playing only if these experiences are first made real by another's recognition of them.

All this suggests that play has a pivotal role in the whole therapeutic process, including the assessment period. The level in which the child operates regarding the sense of inner reality (equivalence mode, pretend mode or reflective and integrated mode) provides the therapist with valuable information when he/she analyzes play characteristics (or its absence). Furthermore, play has various dimensions, like affective, cognitive, narrative and developmental components (Chazan, 2012), beyond its symbolic quality and psychodynamic aspects. All these parameters can help the clinician in children diagnosis and treatment planning. In the same way, these parameters make possible to analyze the therapeutic process, its progress and retreats, and even the treatment's outcomes.

In conclusion: (1) playing is an essentially intersubjective activity; (2) it enables the construction/organization of internal and external realities; (3) the ability to "play" with these internal and external realities, in the sense proposed by Target and Fonagy (1996), leads to greater autonomy, freedom and robustness of the child's psychological organization; (4) when playing is not possible, it needs to be developed, either within the family, educational or clinical context. The approach discussed here may provide aid to interventions for families with very young children, interventions in the nursery and pre-school context and, of course, in the clinical setting.

AUTHOR CONTRIBUTIONS

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

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Commentary: How Child's Play Impacts Executive Function-Related Behaviors

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A commentary on

How Child's Play Impacts Executive Function-Related Behaviors
by Shaheen, S. (2014). Appl. Neuropsychol. Child 3, 182–187. doi: 10.1080/21622965.2013.839612

INTRODUCTION

In a recent review Shaheen (2014) surveys evidence-based and popular programs that are designed to advance the development of executive function in children. In this commentary I propose that psychoanalytic psychotherapy with children is an additional program and therapeutic orientation that promotes executive function development.

In support of this proposal I review the executive function construct, the relationship of emotion regulation to executive function, and the observed similarities between the implicit branch of emotion regulation system and defense mechanisms (Rice and Hoffman, 2014). Elsewhere Rice (2016), I have suggested that systematic interventions upon children's defense mechanisms may promote the development of the implicit emotion regulation system. Because this program of interpretation of children's defenses against painful feelings is an acknowledged (and unacknowledged) central intervention in child psychoanalysis (Hoffman, 2007), it becomes possible to propose that psychoanalytic psychotherapy with children advances executive function development through its promotion of implicit emotion regulation capacities through the technique of defense analysis.

EXECUTIVE FUNCTIONS AND CHILDREN'S PLAY

Executive functions are a set of prefrontal cortex-dependent processes that facilitate the attainment of defined goals (Shallice and Cooper, 2011). The set of processes includes inhibitory control, attentional control, set shifting, working memory, problem solving, and planning.

Sheehan's review emphasizes the means by which structured rule-bound games may improve executive functions. The programs of Bodrova and Halperin (Bodrova and Leong, 2007; Halperin et al., 2013) which build upon Russian learning theory and biobehavioral development (Luria, 1973; Vygotsky, 1978) have attained a significant evidence basis toward improving executive functioning (e.g., Halperin et al., 2013). These programs include games such as "Simon Says" where the child must attend to commands and inhibit action when a command is not preceded by the words Simon Says, "Dance and Freeze" where the child must inhibit all actions on the word freeze and recommence when the music resumes, and "The Opposite Game" where the child must inhibit the commanded action and set-shift to do the opposite. These games' relevance to inhibitory control appears in their empirical evidence base (e.g., Healey and Halperin, 2012).

Programs which derive from educational kinesthesiology (e.g., Williams and Shellenberger, 1994) and rehabilitation science (e.g., Sohlberg and Mateer, 2001) have less robust data (e.g, May-Benson and Koomar, 2010). Major guidelines (e.g., Zimmer and Desch, 2012), though not discounting their value as part of a comprehensive treatment plan, warn that research is limited and inconclusive.

Thus, insofar as the executive functions studied include mostly explicit, cognitive-motor tasks, there is existing evidence to suggest that play therapies promote executive function development.

EXECUTIVE FUNCTIONS AND EMOTION REGULATION

Like executive functions, emotion regulation is another prefrontal cortex-dependent process (Gross, 1998, 2013). It involves matching one's emotions to attain a defined goal. Some (Carlson and Wang, 2007) have already explored the connection of emotion regulation to executive functions in children.

A recent conceptualization of emotion regulation that defines both conscious, explicit and unconscious, implicit processes (Gyurak et al., 2011) yields two neural systems with distinct neural correlates (Etkin et al., 2015). Explicit emotion regulation involves modulation of limbic and visceromotor centers by prefrontal areas including the dorsal anterior cingulate cortex (dACC) and the dorsolateral PFC (dPFC), while implicit emotion regulation involves more ventral prefrontal areas including the orbitofrontal cortex (OFC), ventromedial PFC (vmPFC), and ventral anterior cingulate cortex (vACC). These findings mirror conceptualizations of executive functions as classifiable into "hot" and "cold" cognitive functioning (Zelazo and Carlson, 2012), with "hot" executive functioning sharing conceptual and neuroanatomic correlates with implicit emotion regulation.

IMPLICIT EMOTION REGULATION AND PSYCHOANALYTIC PSYCHOTHERAPY

The implicit emotion regulation construct overlaps with that of defense mechanisms (Rice and Hoffman, 2014). The traditional child psychoanalytic perspective understands defense mechanisms protect the child against unwelcome or painful affects (Bornstein, 1945, 1949; Becker, 1974; Hoffman, 2007). The interpretation of a child's defenses against unwelcome affects may promote development of the implicit emotion regulation system (Rice, 2016) and a subset of "hot" executive functions.

The interpretation of a child's defenses against painful affects is an experience-near technique that helps the child understand how feelings are avoided or expressed and enables the child's play to unfold. For example, often in children disruptive, oppositional, defiant, and provocative behaviors serve to distance the child from bearing uncomfortable feelings. When these behaviors disrupt play a psychoanalytically-oriented clinician will comment on the disruption. This helps the child to reflect upon the meaning of his or her behavior. The child is helped to experience behaviors as protective against unwelcome feelings that may have emerged in the play. Helping the child to experience that these feelings need not be so scary and avoided allows the child to move the play forward. This enables the child to explore new and more adaptive means of experiencing uncomfortable affects. With a less rigid reliance on maladaptive defenses the child's capacity for more developed implicit emotion regulation and "hot" executive functions is advanced.

CONCLUSION

Promoting the development of executive functions through its relation to implicit emotion regulation and defense mechanisms is a valuable and unique contribution of child psychoanalytic psychotherapy. This complements the predominant behavioral play interventions that focus upon explicit, cognitive-motor tasks.

The capability to operationalize defense analysis in a manualized intervention (Hoffman et al., 2015) offers a unique opportunity for contemporary child psychoanalysis. For example, Shaheen includes Stanley Greenspan's "Floor time" model (Greenspan and Wieder, 1998) in her review owing to its goal of advancing emotional development, yet she notes that this program, which she specifies was derived from a child psychoanalyst, was hindered in development of an evidence basis through the difficulty in operationalizing due to "individualized, child-centered nature of the timing and content of interventions." The capability to integrate defense analysis with emotion regulation, executive functioning, and affective neuroscience has the opportunity to overcome this traditional shortcoming of psychoanalytic psychotherapy and perhaps promote a return of the methods of this modality to a more central position in contemporary health care in the near future.

AUTHOR CONTRIBUTIONS

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