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# Personal relevance and state empathy with a character facilitates self-disclosure in film viewers

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Eudaimonic media entertainment has been shown to promote mental health, however, our knowledge of the underlying mechanisms that drive the effect is still limited. This project focuses on self-disclosure, a relevant factor for reducing distress and improving mental wellbeing. The aim was to test whether empathizing with a fictional character and the personal relevance of a story can facilitate self-disclosure responses, as well as to examine the role of social cues and audio-visual formal features. In Study 1, 227 participants were randomly assigned to watch one of 8 videos of individuals sharing their experiences of burnout. Shot scale and social cues were manipulated in the videos. Empathy with the characters but not personal relevance predicted the desire for self-disclosure. In Study 2, participants were randomly assigned to either a control condition ($N = 78$) or one of six manipulated short films ($N = 436$). Movies were manipulated for shot scale and music. Participants' reports on state empathy with the film character, perceived personal relevance of the story, and measures related to self-disclosure were collected. One week later, participants were invited to a second survey on self-disclosure behavior ($n = 390$). Both personal relevance and empathy with character showed strong links to self-disclosure responses. The findings of this project shed light on how self-disclosure is elicited by narratives. These insights are important to further understand the therapeutic effects of narratives.

KEYWORDS

**narratives, self-disclosure, empathy, personal relevance, shot scale, music, film viewing, close-up**

## Introduction

Self-disclosure refers to the intentional (deliberate and voluntary) disclosure of personally relevant thoughts, memories, and feelings about the true self, which has to be differentiated from routine disclosure (Tilton-Weaver et al., 2014) and self-presentation (Schlosser, 2020). Self-disclosure has psychological benefits (Vogel and Wester, 2003). It increases trust and intimacy in relationships (Cozby, 1973; Greene et al., 2006),

reduces stress, and improves wellbeing in the long run (Pennebaker, 1993; Zhang, 2017). People often find it difficult to talk about personal issues due to feelings of shame, fear of stigmatization, or other defense strategies (Larson et al., 2015; Slepian et al., 2020). This fear of self-disclosure is a barrier to seeking support from others (Vogel et al., 2007) and an important contributor to loneliness (Akdogan and Çimşir, 2019). The lack of self-disclosure can reduce the likelihood of recovery as the needed help is not sought (Cepeda-Benito and Short, 1998). Depressive feelings and anxiety are related to the withholding of emotional disclosure (Kahn and Garrison, 2009) and low levels of self-disclosure are related to suicidality in adolescent psychiatric patients (Horesh and Apter, 2006).

There is a growing body of research on the positive effects of media (see Reinecke and Oliver, 2016; Raney et al., 2020) and narratives (e.g., Khoo et al., 2021) specifically. Previous studies show that exposure to narratives can activate skills and processes relevant to the successful navigation of interpersonal relationships, such as social cognition processes (Mumper and Gerrig, 2017; Rooney and Bálint, 2018), empathy (Mar et al., 2006), self-reflection (Khoo and Oliver, 2013), or prosocial behavior (Igartua and Barrios, 2012). However, to the best of our knowledge, self-disclosure has not yet been investigated specifically. The primary aim of the present project is to test the potential of narratives to facilitate self-disclosure.

It can be assumed that the desire for self-disclosure, similarly to any narrative effects, is contingent on the experiential responses to the narrative (Bilandzic and Busselle, 2013). We propose that the narrative response of state empathy with the character and the personal relevance of the story are two important mechanisms facilitating self-disclosure responses. When we construct mental models of fictional or real others, our emotional memories will be activated, and this increased emotional intensity may lead to the desire to share this personal information with others, or in some cases with a professional. The present study aims at testing these assumptions by measuring state empathy with characters, personal relevance, and various self-disclosure responses.

Previous studies have shown that empathy with characters is influenced by shot scale (Rooney and Bálint, 2018) and music (Tan et al., 2007). Closer shots of the face increase empathy (Cao, 2013) and mental state references (Bálint et al., 2020), as well as emotional intensity (Canini et al., 2011) and emotional accuracy (Cutting and Armstrong, 2016). Music has been shown to facilitate emotion recognition (Tan et al., 2007). To gain a more comprehensive understanding of the underlying mechanisms, this study included shot scale in the first study and shot scale and music in the second study to investigate the role of formal features in eliciting state empathy and in turn self-disclosure in viewers.

The findings of this project will help to understand how general self-disclosure after watching is elicited by narratives, and what narrative responses and formal features can increase this effect. These insights are important to further understand the therapeutic effects of narratives.

# Background

## Self-disclosure

Self-disclosure is a type of social sharing that focuses on verbal or non-verbal communication about the true self to others (Cozby, 1973). Self-disclosure can be described by its breadth, that is the variety of topics disclosed during social interaction, depth, which is the level of intimacy in the shared content, and duration, which is the length in which the self-disclosure takes place (Omarzu, 2000). It has to be distinguished from self-presentation, the process through which people manage their image about themselves to the outside world (Schlosser, 2020).

The capability of self-disclosure is an essential component of psychological wellbeing through its close link to emotion regulation (Vijayakumar et al., 2020) and its potential for reducing stress (Pennebaker, 1993; Sloan, 2010). Social sharing of experiences after media exposure have been identified as an important factor mediating between media exposure and wellbeing (Nabi and Prestin, 2016). Sharing a personal emotionally loaded issue with a trusted other can have a cathartic effect, decreasing the intensity of rumination, as well as negative emotions attached to the issue (Derlega et al., 1993; Rimé et al., 2020). Self-disclosure is a crucial factor in the formation of interpersonal relationships (Beike et al., 2016; Brandon et al., 2017). The feeling of closeness and interpersonal intimacy grows through in-depth and reciprocal self-disclosure (Barak and Gluck-Ofri, 2007).

On the other hand, the lack of self-disclosure after stressful life events can decrease psychological wellbeing (Larson et al., 2015; Zhang, 2017). For instance, research has found that ruminating over distressing thoughts can lead to depression (Kahn and Garrison, 2009), and low levels of self-disclosure are related to suicidality in adolescent psychiatric patients (Horesh and Apter, 2006). The lack of self-disclosure can reduce the likelihood of recovery as the needed help is not sought (Cepeda-Benito and Short, 1998). Vogel and Wester (2003) found the tendency to self-disclose as well as to conceal information to be strongly associated to seek help. Whereas, self-disclosure can be seen as an approach factor to help-seeking, self-concealment can be considered as an avoidance factor, decreasing the likelihood of seeking mental help (Vogel and Wester, 2003). Given the psychological benefits of self-disclosure, it is of social value to investigate the factors that may help people to self-disclose. To address the complexity of human-media interaction, we included interpersonal factors (social cues), narrative responses (empathy and personal relevance,) and media-specific factors (formal features) in the investigation.

## Social cue for self-disclosure

An important contextual factor this project investigates is the effect of a social cue. Self-disclosure of an observed other facilitates empathic responses and social-emotional support (Brems, 1989). In interpersonal interactions, people tend to adjust their level of self-disclosure to their communicating partner's self-disclosure, using the partner's self-disclosure as a social cue to set a norm of self-disclosure (Miller and Kenny, 1986; Joinson, 2004). This balance of reciprocity is important both in offline and online interactions (Barak and Gluck-Ofri, 2007). Accordingly, it can be assumed that a social cue of another (online co-viewer) person's self-disclosure facilitates self-disclosure in the viewer.

Self-disclosing characters can serve as models for self-disclosure. According to the social cognitive theory of mass media communication (Bandura, 2009), people can learn and be inspired by observing behaviors in mediated messages; when a behavior is modeled and encouraged, it is more likely that the observer repeats it. In the first study reported here, we examine the effects of modeled self-disclosure by characters and of an external self-disclosure cue. In the second study, we shift the focus from modeled self-disclosure to the role of empathy and personal relevance in eliciting self-disclosure. In the next section, we explicate why empathy with characters together with the personal relevance of the story would promote self-disclosure.

## Empathy with characters and self-disclosure

One of the questions of this research is whether empathy with characters has a mediating role between narrative exposure and self-disclosure. Viewers' emotional engagement with characters is a core component of the narrative engagement experience (Busselle and Bilandzic, 2009). Previous studies identified two key dimensions of (real and media-elicited) empathy: that is affective empathy and cognitive empathy (Lieberman, 2007; Zaki and Ochsner, 2012; Happ and Pfetsch, 2015). Through these processes, viewers create a mental model of the character's inner world, which facilitates their comprehension of the narrative (Busselle and Bilandzic, 2008). Based on previous research on affective and cognitive empathy, we theorize that these two processes are connected to self-disclosure through two different paths.

### Affective empathy and self-disclosure

The role of affective empathy in self-disclosure can be explained by the fever model of self-disclosure (Stiles et al., 1992). Affective empathy, defined as the involuntary process in which one resonates with the affective bodily states of the observed person (Decety and Jackson, 2004; Gallese, 2007; Lieberman, 2007), for example directly experiencing a similar intensity of anxiety when seeing someone in stress. Affective empathy is closely associated with emotional contagion and empathic distress (Davis, 1983), the feeling of negative arousal upon observing someone else in a stressful situation. According to the fever model of self-disclosure (Stiles et al., 1992), people are likely to self-disclose when their experience is emotionally charged, even when the emotions were elicited by mediated messages (Luminet et al., 2000). Research shows that observing and experiencing an event perceived being stressful activates similar neural patterns in the observer (Singer et al., 2004). Consequently, when we observe another person's emotionally charged mental state, we may automatically experience a similarly intense mental state, which in turn facilitates the desire to self-disclose.

### Cognitive empathy and self-disclosure

Previous findings on the connection between autobiographical memory and cognitive empathy can elucidate the role of cognitive empathy in self-disclosure. Cognitive empathy (also mindreading, theory of mind, mentalization, perspective-taking) is the awareness and understanding of mental states in real (Premack and Woodruff, 1978; Baron-Cohen, 2001) or mediated others (Black and Barnes, 2015; Mumper and Gerrig, 2017). Previous findings suggest that cognitive empathy is closely related to autobiographical memory. People tend to empathize more with characters when they have an autobiographical experience matching the story (Koopman, 2015a). Relatedly identification with characters is positively correlated with reflecting on one's own life experiences (Khoo, 2016). Koopman (2015a,b); Koopman (2016) found that personal experience with a story topic predicts empathy with the protagonist as well as insight and post-reading reflection. This is supported by neuropsychological findings indicating that with empathic responses, the memory of one's own experiences is also activated in the observer's mind (Shamay-Tsoory, 2011). Moreover, the more someone can retrieve personally relevant memories, the more they are more able to infer mental states of others (Dimaggio et al., 2008; Tani et al., 2014). Recent studies have shown that cognitive empathy and autobiographical memory are closely related but independent processes with overlapping neural networks that are responsible for tracking similar life experiences during mentalizing (Rabin et al., 2010; Shamay-Tsoory, 2011). Other research revealed that autobiographical memory is used in order infer to others' mental states (Spreng and Mar, 2012). In other words, when viewers empathize with characters, memories of their own life experiences are also activated. These activated memory structures will become part of the narrative experience (Cupchik et al., 1998) rendering the story personally relevant.

## The mediating role of personal relevance in self-disclosure

When exposed to a narrative text, story receivers often look for similarities and dissimilarities between the content of their self-schema and the story schema (Escalas, 2007). Through this self-referencing process (Burnkrant and Unnava, 1989, 1995), the recipient becomes aware of the link between the story content and his or her own experiences (Seilman and Larsen, 1989), and perceives the story as personally relevant (see review by Kuzmičová and Bálint, 2019). In prior studies, various terms have been used for processes similar to personal relevance, such as recognition of aspects of one's own life (Miall and Kuiken, 1995), personal truth (Oatley, 1999), self-perceptual depth (Sikora et al., 2010; Khoo, 2016), or personal resonance (Larsen and László, 1990). Personal relevance is closely related but not necessarily identical to prior knowledge about (Green et al., 2004) or familiarity with an issue (Hoffner and Cohen, 2015).

Personal relevance shapes how a narrative is processed and experienced. Personal relevance increases the depth of processing (see Petty and Cacioppo, 1979), engagement (Sikora et al., 2011), the level of gained insight (Miall and Kuiken, 1995; Koopman, 2011), and mental imagery (Therman, 2008). Importantly, in many emotion theories, the appraisal of goal relevance or need relevance is a key component of the emotional response (see overview of appraisal theories by Ellsworth and Scherer, 2003). Neuropsychological findings also indicate that stimuli being perceived more related to personal concerns are experienced as emotionally more intense (Bayer et al., 2017). Building on the fever model of self-disclosure (Stiles et al., 1992), we predict that higher level of personal relevance of the story will be associated with higher levels of self-disclosure responses.

To sum it up, this project investigates the mediating role of empathy and personal relevance between narrative exposure and self-disclosure. We propose the following paths: (1) increased affective empathy increases the emotional intensity of the narrative experience and this emotional intensity facilitates self-disclosure, (2) increased cognitive empathy activates related autobiographical memories, which can also increase the perceived personal relevance of the story, (3) increased personal relevance increases the emotional intensity of the experience which again facilitates self-disclosure.

## Empathy and audio-visual formal features

This research aimed at experimentally manipulating empathy with characters to test the causal relationships between empathy and self-disclosure. Research inspired by the Limited Capacity Model of Motivated Message Processing (Lang, 2007; Detenber and Lang, 2010) has identified many formal features that have the potential to affect character engagement. One of the most important methodological advantages of manipulating low-level features in a narrative is that the content of the narrative can remain intact.

The most extensively researched formal feature is shot scale, i.e., the apparent size and spatial distance of characters from the camera (Zettl, 2013). It was associated with audience members' empathy (Bálint et al., 2020), liking (Mutz, 2007), emotion recognition (Cutting and Armstrong, 2016), and prosocial behavior (Cao, 2013) in response to mediated characters. Relatedly, it was shown that larger screen size increases character liking (Hou et al., 2012), the intensity of characters' perceived emotions (Lombard et al., 1997), and presence (Bracken, 2005). Additionally, a shorter viewing distance also affects the liking of a character in a positive way (Bellman et al., 2009). Most probably the effect of the shot scale is mediated by the effect of perceived spatial distance on attention (Franconeri and Simons, 2003) and arousal responses (Canini et al., 2011). Furthermore, the close-up of faces is of special importance in empathy responses. Neuroscientific research indicated that images of human faces (Frischen et al., 2007), gazes (Calder et al., 2002), gaze directions (Hood et al., 2003), and gaze dynamics (Pfeiffer et al., 2012) directly activate brain areas responsible for cognitive components of empathy. These findings suggest that shot scale exerts its effect on affective empathy through arousal elicited by image size, and on cognitive empathy through directing viewers' attention to the observed character's facial expression. In this study, it was predicted that an increasing number of close-ups of the character's face will increase empathy with characters in viewers.

In other studies, film music was found to be impactful on viewers' understanding of narrative emotional content as well, presumably because periodicity, pitch, loudness, sound variation, melody variation, and timbre carry emotional value (Lenti Boero and Bottoni, 2008). Film music impacts the type of intentions and relationships viewers ascribe to characters (Bullerjahn and Güldenring, 1994; Vitouch, 2001; Tan et al., 2007, 2017), as well as character likability (Hoeckner et al., 2011). Generally, sound, voices, and music play central roles in shaping the emotional involvement of the audience (Holman, 2010). In this study, it was hypothesized that music will increase empathy compared to environmental sound.

## Summary and hypotheses of studies

This project examines the potential of narratives to promote self-disclosure. Specifically, we test whether empathizing with a fictional character and the personal relevance of a story can facilitate self-disclosure responses.

## Study 1

In study one, we manipulated close-up frequency within a video and the presence of a social self-disclosure cue afterward. Participants watched one of four non-fictional narrative videos of individuals sharing their experience of burnout. The videos were followed by a Facebook comment that either included a self-disclosure cue or not. Participants reported their level of empathy with the character, personal relevance, self-disclosure behavior, as well as desire for further self-disclosure after exposure. We tested the following hypotheses (see overview in Figure 1):

H1: Shot scale affects state empathy. A higher proportion of close ups increases state empathy compared to a higher proportion of medium shots.
H2: Shot scale has a positive effect on self-disclosure post-exposure (Hyp 2.1) and the desire to further self-disclose (Hyp 2.2) and this effect is mediated by state empathy.
H3: Personal relevance positively predicts self-disclosure post-exposure (Hyp 3.1) and desire to further self-disclose (Hyp 3.2).
H4: The presence of a social cue for self-disclosure will increase self-disclosure post-exposure (Hyp 4.1) and the desire to further self-disclose (Hyp 4.2).

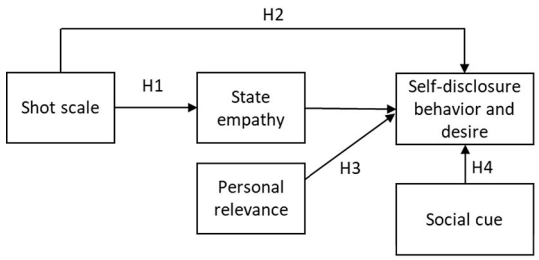


FIGURE 1
Overview of hypotheses in Study 1.

## Study 2

In a control-treatment design, Study 2 manipulated shot scale (close-up frequency) and music in a fictional animated narrative and measured empathy with the character, personal relevance of the story, self-disclosure behavior post exposure, desire to further self-disclose, and self-reported self-disclosure behavior 1 week later. The following hypotheses were tested (see Figure 2 for an overview):

H1: Narrative film exposure compared to no exposure (control) increases self-disclosure post-exposure (Hyp 1.1.), desire to further self-disclose (Hyp 1.2.), and self-reported self-disclosure behavior 1 week later (Hyp 1.3).
H2: Shot scale (Hyp 2.1.) and music (Hyp. 2.2.) have an effect on state empathy with the character. Close-up frequency and music compared to environmental noise increase state empathy.
H3: State empathy with the character, positively predicts self-reported self-disclosure behavior 1 week later, and this effect is serially mediated by self-disclosure post-exposure and the desire to further self-disclose.
H4: Personal relevance positively predicts self-reported self-disclosure behavior 1 week later, and this effect is serially mediated by self-disclosure post-exposure and the desire to further self-disclose.

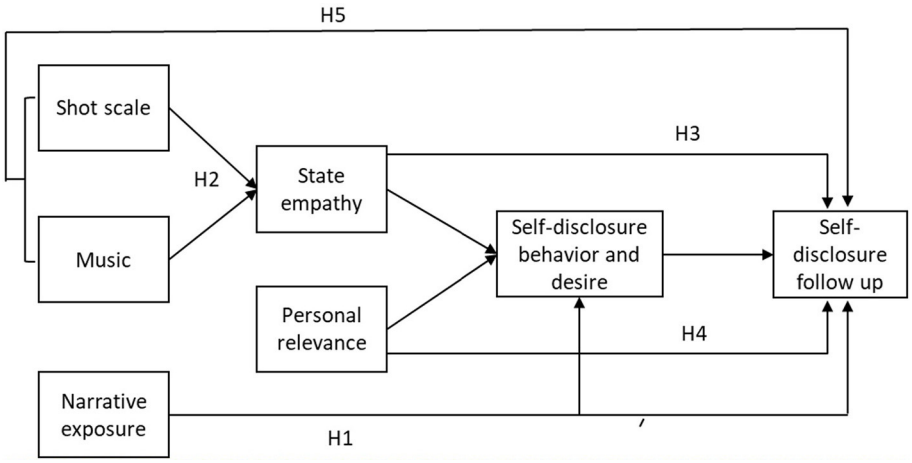


FIGURE 2
Overview of hypotheses in Study 2.

H5: Shot scale and music, i.e. higher close-up frequency, has a positive effect on self-reported self-disclosure behavior 1 week later, and this effect is serially mediated by state empathy, self-disclosure post-exposure, and the desire to further self-disclose.

# Study 1: Method

## Design and procedure

A 2 (shot scale; close-up shot vs. medium shot) × 2 (social self-disclosure cue; absence vs. presence) × 2 (message; control factor) between-subject experiment was conducted to test the hypotheses. The experiment used two video clips as stimulus material (*message*) to assess whether the hypothesized relationships hold across more than one stimulus. In other words, the interest is not in theorizing differences in effects between the video clips, but in the robustness of our findings. Participants were randomly assigned to one of the eight conditions. After giving consent, participants were first asked to view one of the four video clips. After viewing, they were then randomly assigned to a picture of a Facebook comment according to the social self-disclosure cue condition. Participants were then asked to respond to attention check items followed by questions regarding empathy with the character, personal relevance, and self-disclosure responses. The order of empathy scale and self-disclosure measures was counterbalanced. After finishing the questionnaire, participants were thanked for their cooperation and debriefed. Participants were paid $1.46 in exchange for their participation in the experiment.

## Participants

The required sample size was calculated for an F-test using G*Power (Faul et al., 2009) for eight groups and 2 covariates, with a power of 0.80. A small to medium effect size of $f = 0.20$ was used in the power analysis, based on previous research on shot scale and sound in audiovisual narratives (e.g., Cao, 2013; Tan et al., 2017; Bálint et al., 2020). The required sample size denoted by G*Power was 244 participants.

In total, 249 participants were recruited from Prolific, a participant recruitment website for academic research. Participants were required to understand and write Dutch fluently. As the topic of the videos was student burnout, they were also required to be under 35 years of age. Twenty-two participants were excluded from the data analysis because they did not pass the attention checks. These consisted of three questions tailored to the two videos asking about the characters' field of study, their conflict (male character) or challenge (female character), and their sports activity (male character) or living arrangements (female character). Only participants who correctly answered all three questions were included in the analyses.

The final sample consists of 227 participants. Of these, 60.4% identified as male, 38.8% as female, and 0.9% classified their gender as non-binary (these were randomly reassigned to male or female for the analyses). The mean age was 24.4 years ($SD = 4.5$ years). 75.6% lived in the Netherlands, 20.4% in Belgium, and 4.0% lived in other countries. 69.6% of the participants are highly educated, having a bachelor's, master's, or PhD degree. Participants reported low to medium personal contact with people with burnout (1 = *never*, 6= very *often*; $M = 3.49$, SD = 1.34).

Randomization across conditions was successful, the conditions did not differ in terms of gender, $\chi^2 = 9.00$, $df = 14$, $p = 0.831$, age, $F_{(7,219)} = 0.96$, $p = 0.463$, or personal contact with burn-out $F_{(7,219)} = 1.91$, $p = 0.070$.

## Stimulus material and manipulations

### Videos

Two non-fictional narrative video clips were used as stimulus material—one featuring a young female, and the other featuring a young male. The characters in both videos talked about their own experience with going through burnout syndrome. Both videos were from the same series called #OPGEBRAND created by the Dutch news outlet (NOS op 3). The source material was retrieved from YouTube. All video clips are real-life stories of young people dealing with burnout syndrome. The duration of the video clips ranged from 3:05 to 3:38 min. A detailed description of the videos can be found in Appendix 1.

#### Video comparability

To ensure that the videos did not differ in terms of *video quality*, participants were asked to rate the video quality on a 7-points Likert Scale (1 = *very bad*, 7 = *very good*). Overall, the videos were perceived to be of good quality ($M = 5.87$, $SD = 1.00$), which did not vary significantly among all conditions [$F_{(7,219)} = 0.95$, $p = 0.469$, part. $\eta^2 = 0.03$]. Similarly, to ensure that the videos' portrayal of burnout is not perceived as differing in *severity*, one item asked "How serious would you describe the burn-out of the character to be?" The item was measured on a 7-points Likert Scale from (1 = *not serious*, 7 = *very serious*). The burnouts of the characters were perceived as serious ($M = 5.46$, $SD = 1.01$), which also did not vary significantly among the conditions [$F_{(7,219)} = 1.91$, $p = 0.070$, part. $\eta^2 = 0.06$][1].

1 We acknowledge that this *p* value does not allow for a confident judgment on the similarity between groups. However, as the inclusion of perceived burnout severity as a covariate does not substantially change the results, we opted to present the results without it in the analyses.

### Manipulation of shot scale

Following the procedure described by Cao (2013), the two videos were edited yielding a close-up and a medium shot condition. All videos were edited with Final Cut Pro. First, the original videos were analyzed for their shot scale distribution of long shots, medium shots, and close-up shots following the definitions by Bowen and Thompson (2013). Then, both videos were edited. Approximately, in the close-up condition, close-ups are shown in 45–50% of the total duration of the time, whereas in the medium shot condition, medium shots are shown in the 45–51% of the total duration of the time. See Appendix 2 for the shot scale distribution of the original and the manipulated versions. The online links to the stimulus material can be found in Appendix 3.

### Manipulation of social self-disclosure cue

After watching the videos participants viewed an image of a Facebook comment on the video they just watched. The image was either with or without social cue for self- disclosure. The lay-out was exactly the same. It showed the video on a Facebook page, with one single comment below. The comment either related to the commenter (with social cue) or it related to people in general (without social cue). Specifically, there text read as follows:

**With social cue for self-disclosure**

Thank you for sharing your story! That was very brave! Your story is very relatable to me. I have been dealing with the same feelings and issues as you have for a couple of years now. Nobody seems to understand what I'm dealing with. To know that I am not the only one makes me feel a lot better 😊 Stay strong!

**Without social cue for self-disclosure**

Thank you for telling your story! That was very brave! Your story must be relatable to a lot of people. Lots of people have been dealing with the same feelings and issues as you for years. They often feel that nobody understands them. People don't always understand what you're dealing with. You surely make a lot of people feel better with letting them know that they are not alone 😊 Stay strong!"

## Measures

### State empathy

State empathy was measured on a 7-point Likert-scale (1 = *completely disagree*, 7 = *completely agree*) using the cognitive and affective empathy dimensions of the State Empathy Scale (Shen, 2010). *Affective empathy* was measured with four items such as "I was in a similar emotional state as the character when watching this message." The four items were averaged (*Cronbach's* $\alpha$ = 0.75; $M$ = 5.00, $SD$ = 1.04). *Cognitive empathy* was measured with four items such as "I can understand what the character was going through in the message." The four items were again averaged to construct a mean index (*Cronbach's* $\alpha$ = 0.77; $M$ = 5.77, $SD$ = 0.94). Affective and cognitive empathy were combined into an overall index of state empathy (*Cronbach's* $\alpha$ = 0.85; $M$ = 5.38, $SD$ = 0.90).

### Personal relevance

Personal relevance was measured by adapting three items from the Personal Relevance Scale (Ellard et al., 2012) to the context of viewing narratives. We used the following items measured on a scale from 1 = *not at all* to 5 = *very much*: 1. "To what extent (if any) did this video make you think of current situations or events in your own life." 2. "To what extent (if any) did this video bring up memories of past situation or events from your own life." 3. "To what extent (if any) could you personally relate to the emotions displayed or represented in this video." The three items were averaged (*Cronbach's* $\alpha$ = 0.83; $M$ = 3.51, $SD$ = 0.95).

### Post-exposure self-disclosure behavior

Self-disclosure behavior after exposure was measured using an open writing prompt: *We ask you to think about a topic that personally affected you, or a personal experience that made an emotional impression on you. Please write a paragraph about it, were you let your thoughts, emotions and memories run free. When you start writing, keep writing until you are finished. Spelling and grammar are of no importance and you don't need to worry about that. Everything you write here is anonymous and non-traceable to you.* It was a forced entry question, participants were required to enter an response.

To indicate participants' self-disclosure we planned to quantitatively code the responses according to the level of self-disclosure. However, we were not able to reach acceptable reliability as depth of self-disclosure seems to be strongly subjective. Therefore, we decided to use word count as a proxy for self-disclosure behavior. In previous studies, the length of writing has been used as an objective parameter for message quantity because it reflects the writer's "self-disclosure through sharing personal information, thoughts, and feeling with others" (Barak and Gluck-Ofri, 2007, p. 409). The average word count of the responses was 170.54 ($SD$ = 79.04) ranging from 12 to 391 words.

### Desire to further self-disclose

The desire to further self-disclose, i.e., the need of the participants to discuss their own feelings, was measured by tailoring the QSU-brief (Cox et al., 2001) a scale used for measuring people's urge to smoke. Six items from the scale were transformed to the subject of self-disclosure to measure the desire to further self-disclose. Cigarettes were replaced by talking about feelings. For example, "If it were possible, I probably would talk about my own feelings now." The items were measured on a 7-point Likert scale (1 = *not at all*, 7 = *completely*). The scores on the six items were averaged to create a mean index (*Cronbach's* $\alpha$ = 0.89; $M$ = 4.17, $SD$ = 1.34).

TABLE 1 Descriptives and correlations for the main study variables in Study 1.

| | *M* | *SD* | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 1. State empathy | 5.38 | 0.90 | 0.91*** | 0.89*** | 0.74*** | 0.19** | 0.42*** |
| 2. Affective empathy | 5.00 | 1.04 | – | 0.64*** | 0.66*** | 0.18** | 0.39*** |
| 3. Cognitive empathy | 5.77 | 0.94 | | – | 0.69*** | 0.16* | 0.37*** |
| 4. Personal relevance | 3.51 | 0.95 | | | – | 0.21** | 0.36** |
| 5. Self-disclosure (word count) | 170.55 | 79.04 | | | | – | 0.09 |
| 6. Desire to self-disclose | 4.17 | 1.34 | | | | | – |

***p < 0.001, ***p < 0.01, *p < 0.05.

## Study 1: Results

Table 1 provides an overview of the descriptives and correlations of the study variables. Empathy and personal relevance showed a strong positive correlation. Desire to self-disclose was positively associated with state empathy (both cognitive and affective empathy) and personal relevance, but not with the self-disclosure post exposure.

Our first hypothesis predicted an effect of shot scale on state empathy in that close-ups will increase state empathy compared to medium shots. To test Hypothesis 1, we conducted three one-way ANCOVA with shot scale, social cue presence and message as independent variables, and state empathy, affective empathy, or cognitive empathy as the dependent variables, and gender and personal contact as covariates. Shot scale did not have a significant effect on state empathy, $F_{(1,217)} = 130$, $p = 0.255$, part. $\eta^2 = 0.006$, affective empathy, $F_{(1,217)} = 1.26$, $p = 0.264$, part. $\eta^2 = 0.006$, nor did it have a significant effect on cognitive empathy, $F_{(1,217)} = 0.84$, $p = 0.360$, part. $\eta^2 = 0.004$. There were no interactions with any of the other factors, all $p > 0.074$. Thus, Hypothesis 1 was not supported.

Consequently, the mediating effect of empathy for the effect of shot scale on self-disclosure post exposure and the desire for further self-disclosure postulated in H2 was not supported either. Using the same set of ANCOVAs but for both self-disclosure responses as dependent variables we tested whether there is a direct effect of shot scale. However, there were no direct effects, all $p > 0.176$.

In the next step, we conducted regression analyses to examine whether state empathy or affective and cognitive empathy (H2 second path), personal relevance (H3), and the presence of a social cue for self-disclosure (H4) predict self-disclosure post exposure and desire for further self-disclosure. Shot scale and message conditions as well as gender and personal contact served as covariates. The results show that empathy, $b = 0.49$, $SE = 0.14$, $p < 0.001$, 95% *CI* [0.215, 0.758], $\beta = 0.33$, and specifically affective empathy, $b = 0.28$, $SE = 0.11$, $p = 0.012$, 95% *CI* [0.062, 0.499], $\beta = 0.22$, significantly increased the desire for further self-disclosure. Neither cognitive empathy, $b = 0.20$, $SE = 0.13$, $p = 0.122$, 95% *CI* [−0.053, 0.448], $\beta = 0.14$, personal relevance, $b = 0.12$, $SE = 0.14$, $p = 0.370$, 95% *CI* [−0.145, 0.387], $\beta = 0.09$, nor the presence of a social cue, $b = 0.13$, $SE = 0.16$, $p = 0.427$, 95% *CI* [−0.191, 0.449], $\beta = 0.05$, significantly predicted the desire for further self-disclosure (values from regression model with both affective and cognitive empathy). There were no predicted effects on self-disclosure post exposure, as indicated by word count, all $p > 0.19$. Self-disclosure post exposure also did not predict the desire for further self-disclosure, $p > 0.83$. Thus, the second path proposed in Hypothesis 2 was supported with the positive effect of state empathy and affective empathy on the desire for further self-disclosure. H3 and H4 were not supported.

## Study 1: Discussion

Counter to our assumptions shot scale did not have an effect on state empathy. Additionally, the social cue manipulation did not have an effect on self-disclosure.

Empathy with a character and personal relevance showed a moderately strong positive correlation with desire to self-disclose, which suggests that they are both important factors in predicting the extent to which viewers would share personal content after narrative exposure. However, personal relevance and empathy are strongly correlated, when putting them in the same regression model, the effect of personal relevance is canceled out. Affective empathy seems to be strongly related to self-disclosure; experiencing similar feelings to the character's can elicit the desire to share personal content with another person. This effect was shown across two messages.

Participants were prompted to share recent impactful events and the description of these events were submitted to a quantitative content analysis for the depth of self-disclosure. Three independent coders could not reach a sufficient level of inter-rater reliability after several rounds of training sessions. Depth of self-disclosure turned out to be a highly complex and subjective rating category depending on the individual context of the sharer. Therefore, in the current study we used word count as a proxy for self-disclosure behavior. Study 2 aims at improving this measure by asking the participants to rate

the depth of self-disclosure themselves. Besides, the process of self-disclosure unfolds in time. A personally relevant topic is triggered through the narrative exposure, some sharing can happen right after the movie, the desire to talk more might be elicited, but it takes time to process the narrative experience and for the actual self-disclosure behavior to take place. To capture this process, we introduced a follow-up measure in Study 2 and asked participants 1 week after the exposure about their actual self-disclosure behavior.

Study 1 showed that empathy with a non-fictional character who is self-disclosing about a very specific life situation increases the desire to self-disclose in viewers. To explore the nature and strength of the relationship between empathy, perceived personal relevance and self-disclosure, in Study 2, participants were exposed to a fictional character who does not model self-disclosure but rather just goes through the universal human experience of loss and separation.

Concerning the study's sample size, we have to acknowledge that the final sample is lower than the planned sample size based on power calculations (227 vs. 244). We did recruit slightly more participants than needed (249); unfortunately we had to exclude a higher number than expected. At the same time, a sample of 227 still has sufficient power to detect the effect size of $f = 0.20$ according to a sensitivity analysis with G*Power. Nevertheless, we made sure to oversample to a larger degree for Study 2.

# Study 2: Method

## Design and procedure

An online longitudinal experiment was conducted in a three (close-up frequency; low vs. medium vs. high) × 2 (sound; diegetic environmental sound vs. non-diegetic music) plus control group (no movie) between-subject factorial design. Participants ($N = 514$) were randomly assigned to either a film condition ($n = 436$) or a control condition ($n = 78$). Within the film condition, participants were assigned to one out of six versions of the film ($n = 69$–$76$ per condition). One week later, participants were invited to a second survey on self-disclosure behavior ($n = 390$, 48 control group, 342 film group).

The data was collected through Prolific. Dutch speaking participants between the age of 18 and 50 years were invited to a study entitled Film and Emotions. Participants could fill in the survey either using a tablet or a laptop/ PC but not on mobile phone. Participants signed an informed consent. Then the audio of their device was checked. Participants needed to count the number of beeping sounds and enter the correct number. Participants were randomly assigned to either a film or a control condition. Participants in the film condition were randomly assigned to one of the six conditions, and watched the animated film, after which they filled in the attention check items, rated the perceived quality of the movie and reported whether they have seen the movie before. Then they reported their state empathy with the film character, perceived personal relevance of the story. These two scales were presented in randomized order. Afterwards, they were asked to write a paragraph about their thoughts and rate the depth of self-disclosure of their writing, and fill in questionnaires on their urge for self-disclosure. Participants in the control condition were not exposed to a movie but were directed to the self-disclosure related questions directly. One week later, all participants were invited to fill in a short survey on their actual self-disclosure behavior in the past week. Participants were debriefed and reimbursed 1.75 GBP for the main study and 1 GBP for the follow-up study.

## Participants

Participants were recruited through Prolific. The required sample size was calculated for an *F*-test using G*Power (Faul et al., 2009) for seven groups (6 film groups plus one control) and 2 covariates, with a power of 0.85. A smaller effect size of $f = 0.15$ was used in the power analysis for this study, adjusting the effect size estimate based on previous research on shot scale in audiovisual narratives (e.g., Cao, 2013; Bálint et al., 2020) to the small effect sizes seen in study one. The required sample size denoted by G*Power was 489 participants.

In total, 636 participants opened the survey through Prolific, out of which 84 returned the survey immediately. Eight participant failed to identify the theme of the movie (grief), and 28 failed the 4-item attention check on the content of the film (family status of main character, vehicle used by the main character, location of first scene). Only participants with at least 3 correct answers were kept in the sample. The final sample consisted of 514 participants (78 control group, 436 film group), out of which 390 (48 control group, 342 film group) participated in the follow-up study 1 week later. Due to technical issues in the main study, 17 (14 in follow-up) participants in the film group did not receive the empathy and personal relevance scales. There were 229 females in the main study, there were four non-binary participants, they were randomly reassigned to male or female for the analyses All participants reported a native or fluent level of Dutch. Participants' age ranged from 18 to 50 years old ($M = 29.35$, $SD = 7.88$). The 65.6 % of the participants were from the Netherlands, 23.5% from Belgium, and 10.9% had another nationality (e.g., Germany, UK, USA, Poland, Spain). Most participants (28.7%) completed a university of applied sciences education, 27.4% completed a university-level master, and 19.9% had a university bachelor's degree.

The experimental conditions did not differ significantly in age $F_{(6,506)} = 1.25$, $p = 0.281$ and gender distribution $X^2_{(6,514)} = 6.65$, $p = 0.354$, meaning that the randomization was successful.

Forty-four participants had seen the movie before. Independent *t*-test showed no effect of participants' previous

exposure to the movie on any of the dependent variables ($ps > 0.566$), therefore these participants were kept in the sample.

When exploring the patterns in data attrition between main and follow up measurements, independent *t*-test showed no significant difference between participants who participated in the follow-up study compared to those who did not in post exposure self-disclosure $t_{(512)} = 0.009$, $p = 0.742$ and desire for self-disclosure $t_{(512)} = 2.27$, $p = 0.409$, as well as state empathy $t_{(417)} = 1.37$, $p = 0.171$, however the groups differed in personal relevance $t_{(417)} = 2.24$, $p = 0.025$. Chi-square test showed a significant effect of film-control assignment on data attrition [$X^2_{(1)} = 10.32$, $p = 0.001$]. Control group showed a higher level of data attrition (38.5%) compared to film group (21.6%). This indicates that participants were more likely to participate in the 1-week follow-up when they were assigned in the film group.

## Measures

### State empathy

Participants' state empathy was measured following the same procedure to Study 1. The two subscales *affective empathy* (*Cronbach's* α = 0.82; *M* = 5.19, *SD* = 1.12) and *cognitive empathy* (*Cronbach's* α = 0.62; *M* = 5.95, *SD* = 0.74), were combined into an overall index of state empathy (*Cronbach's* α = 0.83; *M* = 5.57, *SD* = 0.83).

### Personal relevance

Personal relevance was measured by the procedure described in Study 1 (*Cronbach's* α = 0.85; *M* = 3.71, *SD* = 1.58).

### Post exposure self-disclosure behavior

Self-disclosure behavior after exposure was measured using an open writing prompt: *We are interested in people's comments. What comes to mind right now? Please write a paragraph about this, giving free rein to your thoughts, emotions, and memories. When you start writing, write on until you are finished. Spelling and grammar are not important, so don't worry about them. Everything you write here is anonymous and not traceable to you.* After writing, participants were asked to rate the depth of self-disclosure in their own texts by choosing one of these options: *Now that you have finished writing, we would like to ask you to rate how much you revealed of yourself in that which you wrote/how personal you were in the text: I did not reveal anything personal (1); I revealed a little bit of personal information, I would share this kind of stuff with a stranger I just met (2); I revealed somewhat personal information, I would share this kind of thing with a colleague or neighbor (3); I revealed a lot of personal information, I would share this kind of thing with a close friend (4); I have revealed very much personal information, I would not share this with anyone except perhaps a psychologist who keeps it secret (5).* This participant given score was used to measure the depth of post-exposure self-disclosure behavior (*M* = 2.31; *SD* = 1.14).

### Desire to further self-disclose

The extent to which participants had the desire to further self-disclose was measured the same way as in Study 1 (*Cronbach's* α = 0.89; *M* = 4.17, *SD* = 1.37).

### Self-reported self-disclosure 1 week follow-up

Participants were contacted again 1 week after their participation in the main study. They were asked to report the extent to which they agree with the following sentence: *In the past week, I have talked to someone about my feelings in the past week* (1 = completely disagree, 7 = very much agree) (*M* = 4.28, *SD* = 1.59).

## Stimulus material and manipulation

### Video clip

The experiment used the 9-min long, international award-winning animated film entitled Father and Daughter (Dudok de Wit, 2001). The main theme of the film is loss and overcoming grief. The detailed description of the movie content and structure can be found in a previous paper of the authors (Bálint et al., 2020).

### Manipulation of shot scale

We used the original (zero close-ups) and two manipulated versions (3 close-ups and 5 close-ups) of this movie created for the study by Bálint et al. (2020). The original video (Dudok de Wit, 2001) did not contain any close-ups, hence this video was used for the zero close-up conditions. No facial expressions were visible in the zero close-ups conditions. For the three and five close-up conditions, the frequency of closeups was manipulated using close-ups of the daughter with a sad facial expression (see Bálint et al., 2020). For the three close-ups conditions, three close-ups of the daughter were inserted at three time marks in the video: at 1:14, 4:47, and 5:33 min. For the five close-up conditions, two more close-ups were added on top of those from the three close-ups conditions: at 2:30 and 3:43 min. The close-ups were added at these time marks to spread them throughout the video. Detailed description of the manipulation of shot scale can be found in Bálint et al. (2020).

### Manipulation of music

There were two versions of each video. One with the soundtrack of the original movie, the waltz melody of

TABLE 2 Descriptives and correlations for the main study variables in Study 2.

| | *M* | *SD* | 2 | 3 | 4 | 5 | 6 | *M* |
|---|---|---|---|---|---|---|---|---|
| 1. State empathy | 5.57 | 0.83 | 0.93*** | 0.84*** | 0.49*** | 0.30** | 0.38*** | 0.20*** |
| 2. Affective empathy | 5.19 | 1.12 | – | 0.58*** | 0.52*** | 0.32** | 0.37*** | 0.22*** |
| 3.Cognitive empathy | 5.95 | 0.74 | | – | 0.32*** | 0.19* | 0.30*** | 0.11*** |
| 4. Personal relevance | 3.71 | 1.58 | | | – | 0.33** | 0.31** | 0.17** |
| 5. Post exp self-disclosure | 2.31 | 1.14 | | | | – | 0.29*** | 0.10* |
| 6. Desire to self-disclose | 4.17 | 1.37 | | | | | – | 0.57** |
| 7. Self-disclosure follow-up | 4.28 | 1.59 | | | | | | – |

***p < 0.001, ***p < 0.01, *p < 0.05.

the *Waves of the Danube*, which is an emotional, rather repetitive, instrumental music. For the no music condition, we replaced the non-diegetic music with professionally made environmental sound fitting to the physical events in the movie (e.g., noise of bicycle, birds, wind) (Dudok de Wit and de Vries, 2010, https://www.youtube.com/watch?v=JeWIGubqxZA).

### Video comparability

Participants rated the films on *video quality* on a 7-points Likert Scale (1 = *very bad*, 7 = *very good*). Overall, the videos were perceived to be of good quality ($M = 4.11$, $SD = 1.03$), which did not vary significantly among all conditions $F_{(5,413)} = 0.487$, $p = 0.779$, part. $\eta^2 = 0.006$.

## Study 2: Results

### Covariates

Age showed a significant weak correlation with affective empathy ($r = 0.171$, $p < 0.001$) and personal relevance ($r = 0.184$, $p < 0.001$). The gender of participants had an effect on desire for self-disclosure $t_{(326)} = -0.281$, $p = 0.005$ and self-reported self-disclosure 1 week follow-up $t_{(326)} = -4.75$, $p < 0.001$, females showing higher levels compared to males. Given these significant effects, these covariates are included in the further analyses.

### Hypothesis testing

Table 2 presents the descriptives and correlations among dependent variables. Self-disclosure responses showed a positive moderately strong relationship with personal relevance and empathy.

A multivariate ANOVA (Bootstrapped with 5000 samples) showed a significant difference between the film group and control group in self-disclosure post exposure $F_{(1,509)} = 5.93$, $p = 0.033$, $\eta^2 = 0.009$ but not in desire for self-disclosure $F_{(1,509)} = 0.58$, $p = 0.312$, $\eta^2 = 0.001$. Results of an univariate ANOVA (Bootstrapped with 5,000 samples) indicated an effect of group assignment on self-disclosure behavior 1 week follow up $F_{(1,386)} = 12.40$, $p = 0.023$, partial $\eta^2 = 0.013$. However, the direction of the effect is the opposite to what was expected. The control group reported higher level of self-disclosure related values compared to the film group (see details in Table 3). Hypothesis 1 was rejected.

TABLE 3 Mean and standard deviation of self-disclosure responses in the control and film conditions in Study 2.

| | Control condition | | Film condition | | |
|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *N* |
| Self-disclosure post exposure | 2.55 | 1.10 | 2.27 | 1.15 | 514 |
| Desire for self-disclose | 4.07 | 1.33 | 4.18 | 1.37 | 514 |
| Self-disclosure follow-up | 4.68 | 1.38 | 4.22 | 1.61 | 390 |

Data was submitted to a regression analysis (enter method) with the variables of close-up frequency, music, and interaction of close-up frequency and music as independent variables, state empathy as dependent variable, with age and gender as covariates. This regression analysis was repeated two more times with cognitive empathy and affective empathy as dependent variables. Results indicated no significant effect of close-up frequency on state empathy $b = -0.11$, $SE = 0.16$, $p < 0.474$, 95% $CI$ [−0.42, 0.20], $\beta = -0.11$; cognitive empathy $b = -0.18$, $SE = 0.14$, $p = 0.194$, 95% $CI$ [−0.46, 0.09], and affective empathy $b = -0.04$, $SE = 0.21$, $p = 0.830$, 95% $CI$ [−0.46, 0.37]. Results showed no significant effect of music on state empathy $b = -0.22$, $SE = 0.21$, $p = 0.307$, 95% $CI$ [−0.64, 0.20], $\beta = -0.13$, cognitive empathy $b = -0.29$, $SE = 0.19$, $p = 0.133$, 95% $CI$ [−0.66, 0.09], $\beta = -0.19$ and affective empathy $b = -0.15$, $SE = 0.29$, $p = 0.601$, 95% $CI$ [−0.639, 0.201], $\beta = -0.07$. The interaction effect of close-ups and music was

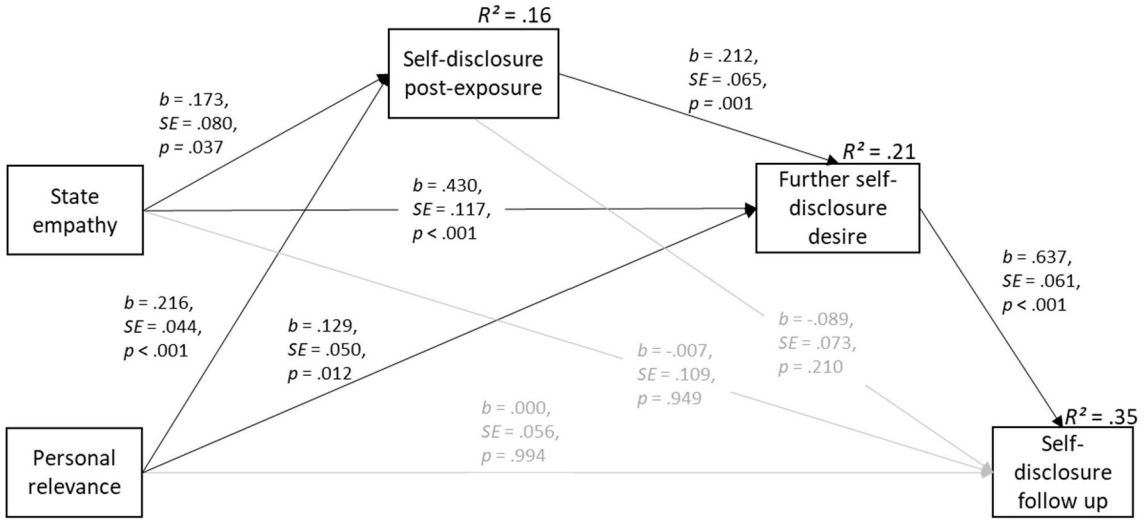


FIGURE 3
Effects of state empathy and personal relevance on self-disclosure follow up (Model 1). $N = 328$, unstandardized regression coefficients, 5.000 bias-corrected bootstrap samples. Model fit: $\chi^2 = 6.57$, $df = 8$, $p = 0.584$; $CFI = 1.00$; $RMSEA = 0.000$, 90% CI [0.000, 0.057]; SRMR = 0.022. Covariates: Gender, age, music, shot scale (for all three DVs).

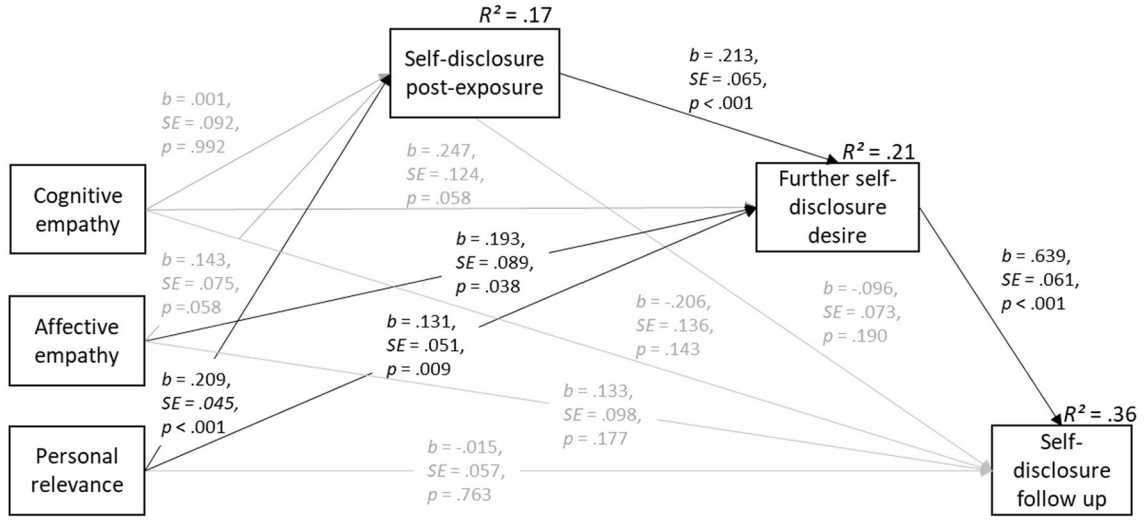


FIGURE 4
Effects of cognitive empathy, affective empathy, and personal relevance on self-disclosure follow up (Model 2). $N = 328$, unstandardized regression coefficients, 5.000 bias-corrected bootstrap samples. Model fit: $\chi^2 = 6.58$, $df = 10$, $p = 0.764$; $CFI = 1.00$; $RMSEA = 0.000$, 90% CI [0.000, 0.057]; SRMR = 0.021. Covariates: Gender, age, music, shot scale (for all three DVs).

non-significant as well on all response variables ($p > 0.05$). Hypothesis 2 was rejected.

We predicted that empathy (H3) and personal relevance (H4) positively predict self-reported self-disclosure behavior 1 week later, and that this effect is serially mediated by self-disclosure post exposure and the desire to further self-disclose To test these hypotheses, we used AMOS 28 to conduct path analyses with 5,000 bias-corrected bootstrap samples as depicted in Figure 2 but adding the formal features as covariates, next to age and gender, instead of as independent variables. We ran two path models, one with state empathy (Model 1, Figure 3) and one with affective and cognitive empathy (Model 2, Figure 4). Both models achieved a very good model fit [Model 1: $\chi^2 = 6.57$, $df = 8$, $p = 0.584$; $CFI = 1.00$; $RMSEA = 0.000$, 90% $CI$ (0.000, 0.057); SRMR = 0.022; Model 2: $\chi^2 = 6.58$, $df = 10$, $p = 0.764$; $CFI = 1.00$; $RMSEA = 0.000$, 90% $CI$ (0.000, 0.042); SRMR

=0.021] explaining 35 and 36 percent of variance, respectively, in self-reported self-disclosure 1 week later. In model 1, both state empathy, $b = 0.28$, $SE = 0.08$, $p < 0.001$, 95% *CI* [0.134, 0.432], $\beta = 0.14$, and personal relevance, $b = 0.09$, $SE = 0.04$, $p = 0.010$, 95% *CI* [0.021, 0.171], $\beta = 0.09$, had significant positive indirect effects on self-disclosure 1 week follow-up. In addition, the total effect of state empathy was significant, $b = 0.28$, $SE = 0.13$, $p = 0.046$, 95% *CI* [0.006, 0.521], $\beta = 0.13$. In model 2, it becomes apparent that it is affective empathy driving the positive effect on self-disclosure reported 1 week after exposure [total effect: $b = 0.26$, $SE = 0.12$, $p = 0.030$, 95% *CI* (0.024, 0.486), $\beta = 0.17$; indirect effect: $b = 0.13$, $SE = 0.06$, $p = 0.028$, 95% *CI* (0.012, 0.246), $\beta = 0.09$], although no longer through self-disclosure right after exposure (Figure 4). Table 4 provides details on total and indirect effects. Hypothesis 3 and 4 can be partially supported.

Hypothesis 5 predicted a mediation effect of state empathy between the audio-visual formal features and self-disclosure responses. While we did not find an effect of the audio-visual formal features on state empathy and thus no mediation effect, a direct effect of shot scale on self-disclosure post exposure, $b = -0.17$, $SE = 0.07$, $p = 0.026$, 95% *CI* [−0.319, −0.024], $\beta = -0.13$, as well as an indirect effect on the desire to self-disclose through post exposure self-disclosure, $b = -0.04$, $SE = 0.02$, $p = 0.014$, 95% *CI* [−0.088, −0.007], $\beta = -0.02$, emerged in the path analyses. Contrary to our expectations, a higher frequency of close-ups reduced self-disclosure post exposure and the desire to self-disclose. Hypothesis 5 was not supported.

# Discussion

The primary aim of this project was to explore the potential of narratives to facilitate self-disclosure. We proposed that state empathy and personal relevance are two important mechanisms facilitating self-disclosure responses. To address the complexity of human-media interaction, we tested social cue as an external factor. Two online between-subject experiments were conducted, in which we aimed at manipulating state empathy through the manipulation of audio-visual formal features. Audio-visual formal features did not have a significant (linear) effect on state empathy, therefore we continued with a correlational analysis of the response variables. In both Study 1 and Study 2, state empathy, affective empathy in particular, was found to have a significant link to the desire for self-disclosure. In Study 2, personal relevance was an additional predictor of self-disclosure responses. Overall then, viewers who empathized with the character and felt that the story was personally relevant, self-disclosed more and reported higher desire to self-disclose, which in turn led to higher level of self-disclosure behavior 1 week later. These findings shed light on the determinants of self-disclosure.

## Empathy and self-disclosure

State empathy was found to be a significant predictor of desire to self-disclose, indicating that viewers' desire to talk about personal issues with another person might be facilitated by their emotional engagement with the character. This relationship emerged in both studies and for both modeled and non-modeled self-disclosure, suggesting a generalizable result. Additionally, state empathy was closely related to self-disclosure post exposure in Study 2, meaning that participants who empathized with the character more, shared more personal content after the movie.

Results suggest that the effect of state empathy on self-disclosure responses is driven by affective empathy. This finding is in line with the literature on the close connection of affective empathy and activation of own past experiences (Shamay-Tsoory, 2011). The significant relationship between affective empathy and desire to self-disclose confirms the fever model (Stiles et al., 1992), which states that the intensity of the emotional experience impacts social sharing. Cognitive empathy showed a moderately strong positive correlation with self-disclosure responses in both studies, however this effect disappeared when the effect of other variables were taken into account. It seems that self-disclosure is more connected to the activation of an observed emotional experiences relative to the understanding of that experience.

Empathy and self-disclosure were strongly associated in both studies, suggesting that this relationship may hold independently of the fictionality of the narrative message. This is in line with previous meta-analytic findings that shows that both fictional and non-fictional stories have a strong potential to elicit narrative effects (Braddock and Dillard, 2016). Moreover, there was a relationship of empathy and self-disclosure both with a self-disclosing and a non-self-disclosing character, which suggests that self-disclosure does not necessarily occur as a result of symbolic modeling rather it is the result of activation of personally relevant mental content through (affective) empathy. Empathy is a core process of character engagement, however, future research should extend the scope to other processes such as parasocial relationship (Giles, 2002) or identification (Tal-Or and Cohen, 2010). Viewers' parasocial relationship can be interesting for self-disclosure in particular as it refers to the illusion of having a friendship with a media character. It might be that the desire for self-disclosure in some cases led to an imaginary self-disclosing dialogue with the character, rather than with a real other.

## Personal relevance and self-disclosure

In both studies, personal relevance showed a positive correlation with self-disclosure responses, indicating that the

TABLE 4 Total and indirect effects of Model 1 and Model 2 path analyses.

| | b | SE | p | BC 95% CI [LL, UL] | β |
|---|---|---|---|---|---|
| **Model 1–State empathy** | | | | | |
| Total effect state empathy | 0.275 | 0.132 | 0.046 | 0.006, 0.521 | 0.133 |
| Indirect effect state empathy→ … → SDfollow | 0.282 | 0.079 | <0.001 | 0.134, 0.432 | 0.137 |
| Total effect personal relevance | 0.093 | 0.066 | 0.171 | −0.039, 0.220 | 0.089 |
| Indirect effect personal relevance→ … → SDfollow | 0.092 | 0.037 | 0.010 | 0.021, 0.171 | 0.088 |
| **Model 2–Cognitive & affective empathy** | | | | | |
| Total effect cognitive empathy | −0.048 | 0.160 | 0.783 | −0.356, 0.276 | −0.021 |
| Indirect effect cognitive empathy→ … → SDfollow | 0.158 | 0.079 | 0.051 | −0.001, 0.313 | 0.071 |
| Total effect affective empathy | 0.262 | 0.118 | 0.030 | 0.024, 0.486 | 0.172 |
| Indirect effect affective empathy→ … → SDfollow | 0.129 | 0.059 | 0.028 | 0.012, 0.246 | 0.085 |
| Total effect personal relevance | 0.077 | 0.067 | 0.256 | −0.055, 0.205 | 0.074 |
| Indirect effect personal relevance→ … → SDfollow | 0.092 | 0.037 | 0.011 | 0.022, 0.168 | 0.088 |

Bootstrap sample size = 5,000; BC 95% CI, bias-corrected confidence interval; LL, lower limit; UL, upper limit.

level to which viewers perceived reminders of their own life experiences in the movie was associated with their actual self-disclosure after the movie, their desire to talk more about personal issues, and their actual self-disclosure 1 week later. This relationship was observable in both studies, indicating that personal relevance is closely related to self-disclosure independently of the fictionality of the narrative message. The path analysis confirmed the direct effect of personal relevance on self-disclosure post exposure and desire to self-disclose, and its indirect effect on self-disclosure behavior in the follow-up. This suggests that the activation of personal memories promotes self-disclosure in the short term, which in turn motivates a longer term self-disclosure, albeit not translating into a significant total effect. Thus, other factors might have to be taken into account here.

## Prediction of long term self-disclosure behavior

To go beyond a cross-sectional design, the present research included a 1 week follow-up measure of self-disclosure. The results showed an overall effect of empathy on long term self-disclosure that was fully mediated by post exposure and the desire to self-disclose. While personal relevance did not have an overall effect on self-disclosure in the follow-up there was also an indirect effect through post exposure self-disclosure and desire to self-disclose. This indicates that the desire to self-disclose is a necessary component fostering long term self-disclosure in the real world. The effect of narrative responses on real-life self-disclosure are channeled through the elicited desire to self-disclose.

## Measuring self-disclosure

Innovatively, in Study 2, we asked participants to rate the depth of self-disclosure of their own writing, yielding an indicator of self-disclosure behavior after narrative exposure. We introduced this measure after having failed to reach sufficient inter-rater reliability in rating self-disclosure in participant-generated texts in Study 1. Asking the participants to rate the depth of their own self-disclosure can handle a lot of contextual-individual factors that an independent coding would not be able to. At the same time, participants did not specify whether their self-disclosure was related to the movie or the memory elicited by the movie or an unrelated topic. Future research should disentangle different aspects of self-disclosure, which will help to further understand how narratives may help to circumvent defense mechanisms preventing self-disclosure. Moreover, setting the time interval to 1 week between narrative exposure and follow-up measurement might have also introduced too much noise. Future research should test shorter intervals to increase experimental control.

In the current project, personality traits relevant for self-disclosure or empathy were not included, despite their importance. Future studies should explore potential main and interaction effects of steady personality features to explain between-person differences.

## Social cue

We included an external factor, social cue for self-disclosure, however, this manipulation had no effect on participants' desire to self-disclose. The lack of effect did not result from a ceiling effect, the average desire to self-disclose was 4 on a 7-point scale. Rather, it seems that one (short) comment might not

be perceived as a socially relevant encouragement for self-disclosure. Future studies need to think of more ecologically valid ways to integrate the interpersonal factor of self-disclosure. Especially, because self-disclosure after narrative exposure takes place in a social context most of the time.

## Audio-visual formal features and empathy

The present study planned to experimentally manipulate empathy through the manipulation of shot scale and music. Contrary to previous studies, the present project could not detect the effect of audio-visual formal features on self-reported empathy. The low effect size of the shot scale manipulation in Study 1 might be due to the way shot scale was manipulated. We compared close-up shots to medium shots, however, it might be that medium shots are just as effective in showing the face and emotional expressions of characters as close-up shots. Specifically, the fact that we did not remove all close-up shots from the medium shot condition just decreased their proportion in the whole duration of the movie which might have been too subtle to exert a measurable effect.

Another explanation for the lack of significant effect, is the way empathy was measured. In this research, we used self-report scales for state empathy, which might be less sensitive to the subtle effect of audio-visual features. In previous research, performance tasks of theory-of-mind were used and were shown to be influenced by close-up frequency (Bálint et al., 2020). Future research should introduce more effective ways of manipulating empathy, which will enable going beyond the correlational nature of the current study. For example, manipulating empathy by instruction manipulation (e.g., participants are instructed to take the perspective of the character or focusing on stylistic components) can be an effective way to create variance in response without having to manipulate a video clip.

Unexpectedly, shot scale exerted an effect on self-disclosure post exposure and, indirectly, on the desire to self-disclose that was contrary to the hypotheses. A higher frequency of close-ups actually reduced self-disclosure responses after viewing. While previous research has demonstrated the effect of close-ups on social cognition (Rooney and Bálint, 2018), other work has demonstrated that the number of close-ups is not linearly related to increases in social cognition responses, rather higher numbers can be associated with lower mental state attribution (Bálint et al., 2020). This finding indicates that shot scale can modulate self-disclosure behavior, however, the nature of the effect may not be linear or perhaps not mediated via empathy but through some other, yet unknown, processes. For example, perhaps the lack of close-up shots led to some ambiguity about character responses and participants projected from their own experiences. This interpretation might also help understand another counterintuitive finding from this current study: the effect of narrative exposure.

## Effect of narrative exposure

We introduced a control group to test the direct effect of narrative exposure on self-disclosure. Surprisingly, the control group showed a higher level of self-disclosure behavior post exposure, as well as in the 1 week follow-up. Taken together with the earlier finding that higher frequency of close-ups was associated with lower self-disclosure, the finding can be interpreted from the perspective of catharsis theory of aesthetic experiences (Khoo and Oliver, 2013). In this way, perhaps during narrative exposure emotions are elicited but only partly processed leaving less need for self-disclosure. Yet this is not the only possible interpretation. Self-disclosure post exposure was measured through participant-rated depth of self-disclosure in their own writing. It can be that this self-rating is reliant on a subjective reference point, which might have been shifted by the emotional content of the movie. In other words, the same level of self-disclosure is rated less deep after having watched a movie on grief compared to not having watched emotional content. This raises the issue of the kind of treatment given to the control group in research such as this. In the current study, we decided not to expose participants in the control group to any mediated message. However, it can be that showing a non-fictional self-help video on a similar topic could prevent this systematic bias. Additionally, data attrition was not random in Study 2; attrition was significantly higher in the control group. It can be that only those who were triggered by the self-disclosure scales at a higher level were willing to participate in the follow-up group.

# Conclusion

The primary aim of this research was to explore the potential of narratives to facilitate self-disclosure and to test two potential underlying mechanisms, state empathy and personal relevance. The findings indicate that both empathy, affective empathy in particular, and personal relevance are strongly related to self-disclosure behavior after the movie and desire to self-disclose. This relationship appeared both with non-fictional and fictional characters. Furthermore, self-disclosure did not have to be modeled for this effect to occur. The relationship of empathy and personal relevance to self-disclosure was detected even 1 week after the self-disclosure. These findings extend existing research on narratives and wellbeing and the role of character engagement in

carrying psychological effects. These insights make an important contribution to further understanding the therapeutic effects of narratives.

## Data availability statement

Publicly available datasets were analyzed in this study. This data can be found here: https://doi.org/10.34894/MME21W.

## Ethics statement

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

## Author contributions

KB and BR contributed to the theoretical conception and experimental design of the studies. BR led the stimuli preparation. KB organized the data collection. KB and FS performed the statistical analysis and wrote the first draft of the manuscript. All authors contributed to the revision of the paper and approved the submitted version.

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## Conflict of interest

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

## Publisher's note



## Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fcomm.2022.984341/full#supplementary-material

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