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DOI

[10.1080/15213269.2021.1879654](https://doi.org/10.1080/15213269.2021.1879654)

Publication date

2022

Document Version

Final published version

Published in

Media Psychology

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[Link to publication](#)

Citation for published version (APA):

Rohm, S., Hopp, F. R., & Smit, E. G. (2022). Exposure to serial audiovisual narratives increases empathy via vicarious interactions. *Media Psychology*, 25(1), 106-127. <https://doi.org/10.1080/15213269.2021.1879654>

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Exposure to serial audiovisual narratives increases empathy via vicarious interactions

S. Rohm ^a, F. R. Hopp ^b, and E. G. Smit ^a

^aAmsterdam School of Communication Research, University of Amsterdam, Amsterdam, The Netherlands; ^bDepartment of Communication, Media Neuroscience Lab, University of California, Santa Barbara, California, USA

ABSTRACT

This study examines how exposure to serial audiovisual narratives is associated with media users' empathy. While mounting evidence suggests enhanced empathy following exposure to written, fictional narratives, the present study expands this line of research to the context of fictional serial audiovisual narratives. Considering that social interactions are instrumental for empathic development, vicarious interactions are proposed as a key mechanism in the relationship between exposure to fictional audiovisual narratives and empathy. Furthermore, the empathy-enhancing role of exposure to eudaimonic entertainment in particular is assessed. Additionally, possible boundary conditions are explored with respect to personality traits linked to reduced empathy. The conducted analyses combine logged data from participants' Netflix viewing histories with self-report data from an online survey ($N = 262$). Results suggest that exposure to fictional serial audiovisual narratives predicts empathy via vicarious interactions. Moreover, eudaimonic experiences positively predict vicarious interactions and empathy. The role of specific media content, instead of mere exposure time, is therefore discussed with respect to the facilitation of media enhanced empathy.

Media psychologists are increasingly considering the degree to which media consumption – particularly audiovisual media – affects media users' sociability and empathy. Within this line of inquiry, two primary media effects research trajectories have emerged: the focus on negative effects of violent media content on desensitization and decreased empathy (e.g., Anderson et al., 2010, but see Ferguson, 2014) as well as on the positive effects of prosocial media content on prosocial behaviors and empathy (e.g., Prot et al., 2014). Yet, while these lines of research are content-specific, the study of individuals' holistic media consumption is still in its infancy. Moreover, conceptual issues regarding the definition of empathy and its distinction from sympathy (see Vossen, Piotrowski, & Valkenburg, 2017) have further complicated the synthesis of such research.

CONTACT S. Rohm  sonja_rohm@web.de  Amsterdam School of Communication Research, University of Amsterdam, , Amsterdam, The Netherlands.

The data of this study are made available via the Open Science Framework at https://osf.io/gh7va/?view_only=bde96ee0046447bc9f4640600601a8c1

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Hence, the answer to the question whether media “makes [*sic*] us kind or cruel” (Waytz & Gray, 2018, p. 486) remains controversial and largely inconclusive.

To address this debate, scholars have recently illuminated the idea that exposure to fictional narratives in general (i.e., detached from content-specific, violent/prosocial cues) may increase empathy. More specifically, it is argued that complex social interactions are highly salient within narrative fiction and constitute an instrumental component of storytelling (e.g., Mar, Oatley, Djikic, & Mullin, 2011). As such, fictional narratives simulate natural social experience to a degree that neural responses arising from narrative exposure approximate brain activation elicited by similar *real-world* experiences (Kanazawa, 2002; Speer, Reynolds, Swallow, & Zacks, 2009). Furthermore, exposure to narratives stimulates audiences to infer the minds of characters, project their own thoughts and life onto the situation of others, and thereby fosters empathy (Djikic, Oatley, & Moldoveanu, 2013; Dodell-Feder & Tamir, 2018; Johnson, 2012; Kidd & Castano, 2013; Mar, Oatley, & Peterson, 2009).

Notably, these studies have primarily explored how mentalizing processes, induced via *written* narrative fiction, modulate readers' empathy. It remains unexplored which additional mental processes link narrative consumption and empathic skills, and how these effects transfer to more naturalistic, audiovisual narratives. Hence, we herein examine how *vicarious interactions* – observing social interactions on screen – exert an influence on media users' empathy. While empathic skills are developed and enhanced through *direct* social interaction (Preston & de Waal, 2002), humans also exercise their social cognition through *vicarious* (i.e., mediated) experiences (Bandura, 2001; Burke, Tobler, Baddeley, & Schultz, 2010). In fact, the idea that media content provides individuals with “the illusion of face-to-face relationship with the performer” was already coined by Horton and Wohl (1956, p. 215), who termed this process *parasocial interaction*. Since then, mounting empirical evidence suggests that parasocial interactions constitute the basis for eliciting cognitive and affective reactions to media characters (i.e., *parasocial responses*; Schiappa, Gregg, & Hewes, 2005). Accordingly, we argue that empathy of audiovisual narrative consumers is fostered by the continuous vicarious experience of modeled social interactions, which are highly salient in fictional narratives (Djikic et al., 2013).

Moreover, we explore the link between vicarious interactions and media users' empathy in the context of fictional, serial audiovisual narratives. Such narratives refer to continuous, scripted stories about invented characters, portrayed by actors, and their social interactions (Djikic et al., 2013), and are produced for television. Our focus on serial narratives is motivated by two factors: First, in contrast to self-contained narratives, serial fictional narratives are characterized by longer storylines and more nuanced, longitudinal character development. Therefore, prolonged exposure to serial narratives allows for greater narrative engagement (Pittman & Sheehan, 2015), which in turn should amplify the involvement with portrayed social interactions and thereby foster

empathy. Second, previously researched fiction reading primarily applies to older and higher educated individuals (Kraaykamp & Dijkstra, 1999), whereas watching serial narratives pertains to a greater variety of age groups and social classes.

Empathy and media consumption

Although there is no complete consensus on the definition of empathy, most scholars agree that empathy refers to the innate ability to vicariously experience (affective empathy) as well as understand another individual's feelings (cognitive empathy) (Decety, 2015; Lockwood, 2016; Vossen & Valkenburg, 2016). More specifically, affective empathy refers to sharing someone else's affective state through observing or imagining their experience (De Vignemont & Singer, 2006), while cognitive empathy refers to taking the perspective of another and thus understanding and anticipating what they are feeling (Decety, 2015). Both components develop throughout the lifespan, especially during adolescence and young adulthood. Interestingly, research has shown that after these developmental phases, empathy still remains malleable and is subject to an individual's social environment (Decety, 2015). Further, individuals' empathy greatly modulates their moral development (Hoffman, 2001), and low levels of empathy have been consistently related to aggressive and antisocial behavior (Feshbach & Feshbach, 1982), while higher empathy levels predict prosocial behavior (e.g., Eisenberg & Fabes, 1990). Thus, it is unsurprising that factors influencing empathy have been of great interest to various scholarly fields, including that of media psychology.

An extensive body of research has focused on the negative impact of violent media on children and adolescents' empathy, with largely consistent findings. Both early and more recent meta analyses show that violent media consumption is persistently associated with aggressive behavior and reduced empathy (e.g., Anderson et al., 2010; Wood, Wong, & Chachere, 1991). Yet, with the increasing consideration of positive media effects (Reinecke & Oliver, 2017), scholars determined that these undesirable outcomes were content-specific. In fact, prosocial media decreased aggression and increased prosocial behavior, empathy, and helping (e.g., Greitemeyer, 2011; Prot et al., 2014). Although such research bears valuable insights about certain media contents, its external validity may be limited as individuals never only attend to either violent or prosocial media but likely have more nuanced media diets. Accounting for such broader media environments, Vossen and Valkenburg (2016) considered the impact of adolescents' general social media use, and found that both affective as well as cognitive empathy significantly increased with social media use over the course of one year.

Fiction reading and empathy

A different line of research has considered empathy in a wider media context and in the largely under-researched population of adults. More specifically,

this body of research argues that reading *narrative fiction* in general, and thus regardless of whether the contents of such narratives are violent or prosocial, prompts the reader to “engage in mind-reading and character construction” (Kidd & Castano, 2013, p. 377). Such mentalizing requires the application of empathic skills, and exposes the reader to simulations of social interactions, which lie at the core of empathic development (e.g., Hoffman, 1977; Lockwood, 2016). Empirical evidence for the positive relationship between reading fiction and empathy is provided by several studies (e.g., Djikic et al., 2013; Kidd & Castano, 2013; Mar et al., 2009). In fact, a meta-analysis considering experimental data found that reading fiction, in comparison to non-fiction or no reading at all, significantly improves social-cognitive performance, including empathy (Dodell-Feder & Tamir, 2018). However, while the impact of reading fiction is unanimously considered to be positive, only very little research has considered other media formats, including audiovisual media. This unilateral focus on fiction reading may be due researchers’ conceptualization of written fiction as an active medium, which requires imagining and understanding the characters’ emotions to enjoy the story and thereby train empathic skills (Kidd & Castano, 2013). In contrast, audiovisual narratives, although passive, are more naturalistic (Sonkusare, Breakspear, & Guo, 2019) as they provide a rich sampling space of realistic social behavior, and further reinforce these social interactions via cinematographic choices, music, and the actors’ performances (e.g., Cohen, 2001; Kennedy & Mercer, 2002; Wang & Cheong, 2006).

Vicarious interactions as catalyst for empathy

Social interactions are a primary pathway through which empathy is nurtured. Generally speaking, social interactions facilitate the development and enhancement of mental representations of emotions, which are required to understand and share the emotions of others (Preston & de Waal, 2002). More specifically, social interactions allow individuals to perceive others’ emotional states, which then create or extend existing representations of emotional states and ultimately activate them. According to Social Cognitive Theory (SCT; Bandura, 2001), however, “virtually all behavioral, cognitive, and affective learning from direct experience can be achieved vicariously” (p. 270). Thus, the social interactions through which humans learn behavior and skills, including empathy, need not be their own lived experiences but can be vicarious. While an individual’s immediate social environment may provide various models that allow for social learning, media content offers a plethora of symbolic models concerning human values, perspectives, and behavior patterns, which greatly exceed the possibilities of a single individual’s periphery (Bandura, 2001). Thus, although audiovisual narratives may not provide the same interpretative opportunities as written fiction, they offer innumerable

vicarious interactions and thus facilitate emotional learning (Nabi, So, & Prestin, 2010).

We contend that meaningful vicarious interactions are especially prominent in serial audiovisual narrative fiction. Examples of such series span sitcoms, including “Friends”, or dramas such as “Orange is the New Black”. In contrast, documentaries, (scripted) reality-TV, and competition shows are considered nonfiction. Given the continuity and duration of serial narrative fiction, which often allow for more in-depth character evolvment, viewers may connect even more deeply with the narrative and its social interactions (Pittman & Sheehan, 2015) compared to self-contained narrative fiction.

Although most research on narrative fiction and empathy has found positive direct relationships between general exposure to written fiction and empathy (e.g., Djikic et al., 2013; Dodell-Feder & Tamir, 2018; Kidd & Castano, 2013), Vossen et al. (2017) did not find a direct relationship between self-reported exposure to nonviolent television contents. Based on the outlined rationale, we also do not expect a direct relationship between exposure to serial narrative fiction and empathy, but a fully mediated relationship through vicarious interactions (H1). Considering that for individuals to experience vicarious interactions during narratives, they need to be exposed to them, it is further expected that the more individuals are exposed to serial narrative fiction, the more vicarious interactions they will have (H2). Finally, given that empathy is developed during social interaction (Preston & de Waal, 2002), vicarious interactions during exposure are expected to positively predict affective (H3a) as well as cognitive empathy (H3b).

Conceptual issues concerning empathy and sympathy

Although the premises of previous studies on written narrative fiction and empathy are well-argued, they are overshadowed by a conceptual issue regarding the definition and distinction of empathy. While several authors (e.g., Djikic et al., 2013; Johnson, 2012) claim to measure affective empathy, their operationalizations of this variable more closely resemble sympathy, which reflects an ongoing scholarly debate about the differences between empathy and sympathy (Vossen et al., 2017). According to Clark (2010), sympathy is defined as feeling concern about someone who is in distress, and thus feeling *for* someone. Affective empathy, on the other hand, relates to understanding and experiencing someone else’s feelings, and thus feeling *with* someone, which makes these two constructs conceptually different. Although genuine sympathy may be an output of the empathic process, it is not part of it (Reniers, Corcoran, Drake, Shryane, & Völlm, 2011). This issue also permeates several studies claiming that violent media contents lead to a decrease in empathy, while they in fact measured sympathy. In an attempt to replicate these findings using the accurate measures of each variable, Vossen et al.

(2017) showed that there was no relationship between violent media exposure and any of the empathy components. Only sympathy was negatively related to violent media, suggesting desensitization instead of a decline in empathy. In line with Vossen et al. (2017), the current study will also test the role of sympathy as a conceptually different construct to integrate the results into previous findings. First, it is suggested that a factor analysis of the items measuring affective empathy and sympathy will reveal two distinct factors (H4). Second, there is relatively consistent evidence that reading fiction increases sympathy (although termed affective empathy in e.g., Djikic et al., 2013; Johnson, 2012). However, Vossen et al. (2017) did not find significant relations between nonviolent media and sympathy. Thus, we ask: How are vicarious interactions during exposure to serial narrative fiction related to sympathy (RQ1)?

The enhancing role of eudaimonia

Kidd and Castano (2013) have argued that especially literary fiction fosters (cognitive) empathy, as – opposed to the rather light reading associated with best-selling fiction – it offers unpredictable characters and disruptions in expectations, which require greater engagement of the psychological processes that build empathy. In a similar vein, this paper proposes that eudaimonic compared to hedonic narratives should also be more effective in increasing empathy through broader vicarious interactions. Eudaimonic narratives are characterized by sad and poignant contents that focus on somber and moving areas of human life and are generally associated with feelings of appreciation, elevation and human virtue (e.g., Oliver & Raney, 2011; Roth et al., 2018). Hence, the array of displayed interactions and subsequent emotions should be wider compared to hedonic entertainment, which rather relates to fun and suspenseful experiences. In turn, this wider range of meaningful social interactions in eudaimonic media may also allow individuals to experience more diverse vicarious interactions. In support of this assumption, Johnson, Slater, Silver, and Ewoldsen (2016) showed that search for meaning in life, which usually indicates a preference for eudaimonic entertainment (Oliver & Raney, 2011), is strongly positively related to boundary expansion, which comprises vicarious interactions. Therefore, it is argued that for individuals who experience more eudaimonic entertainment, narrative exposure more strongly relates to vicarious interactions (H5). Of note, eudaimonic or hedonic entertainment experiences are not content-specific as are violent or prosocial media. First and foremost, they are characterized by the emotions they elicit (e.g., Oliver & Raney, 2011; Wirth, Hofer, & Schramm, 2012), and can thus be found in a variety of contents. For example, some violent movies such as “Dunkirk” or “Fight Club” are likely to be considered eudaimonic entertainment for their moving, and somber aspects that trigger feelings of poignancy

in the viewer, while other violent movies such as “Kingsman” or “Deadpool” would rather be considered hedonic for their comedic and suspenseful aspects. Thus, considering the moderating role of exposure to eudaimonic entertainment does not contradict the previous claim that this study considers content-unspecific media.

The dampening role of maladaptive and dysfunctional personality traits

While exposure to eudaimonic entertainment may enhance effects on empathy, certain individual differences could hinder them. Deficits in empathic responses are generally marked by interpersonal difficulties (Kidd & Castano, 2013), which may block any influence narratives have on empathy. More specifically, it is argued that pathological character traits known to interfere with the capacity for empathy must be considered as moderators to determine whether someone’s empathy levels (or more specifically, the lack thereof) are in fact attributable to the exposure to narratives. Especially the psychopathy component of the dark triad (Paulhus & Williams, 2002), as well as alexithymia are likely to mitigate these effects as they are characterized by a lack of empathy and the incapability of expressing and recognizing one’s own and others’ emotions. Yet, these socially aversive character traits are differently linked to the respective dimensions of empathy. On the one hand, research has shown that psychopathy is consistently linked to lower levels in affective empathy (e.g., Jonason & Krause, 2013; Wai & Tiliopoulos, 2012). Further, a systematic review of neurological studies has found that vicarious interactions are generally atypical in individuals high in psychopathy (Lockwood, 2016), meaning that the core mechanism to develop empathy through serial audiovisual fiction proposed in this paper may not be activated for these individuals. Thus, it is expected that for individuals high in psychopathy, vicarious interactions during exposure to narrative fiction will not increase affective empathy (H6).

On the other hand, findings linking psychopathy and cognitive empathy are inconclusive. Whereas Wai and Tiliopoulos (2012) found negative, yet insignificant effects, Jonason and Krause (2013) did not find any meaningful relations. Therefore, alexithymia, i.e., the inability to understand and communicate one’s own emotions as well as think externally-oriented, which has been found to be more predictive of a lack in cognitive empathy (Jonason & Krause, 2013), will be considered as a second moderator. Thus, it is expected that alexithymia negatively moderates the relationship between vicarious interactions and cognitive empathy (H7).

Method

Procedure and sample

Data were collected using an online questionnaire, during which participants were asked to upload their Netflix histories as an observed measure of

narrative exposure. Ethical approval was obtained from the affiliated institution's review board, and all participants gave informed consent to partake in the study. The first part of the survey assessed the media exposure and experience variables, including the retrieval and upload of each participant's Netflix history. To assure valid responses, participants who did not use Netflix were filtered out in the beginning. The second part assessed all psychological variables. Finally, participants were debriefed and thanked for their participation.

Two sampling strategies were used during data collection. First, participants were recruited through mailing lists and Facebook groups. As an incentive for participation, individuals could win one out of two 50€-Netflix gift cards. Second, 707 individuals were identified and invited to participate in the study using the Prolific Academic (PA; <https://www.prolific.ac/>) panel. According to PA's ethical guideline of paying participants at least 5.00£ per hour, each participant received 85p for their completed submission.

To assure that the samples could be merged without impairing the results, *t*-tests comparing the main variables and demographics were conducted. Except for higher psychopathy ($MDiff = -.42$, $t(259) = 2.56$, $p < .05$) in the PA sample, no significant differences in the main variables were obtained. With regard to demographics, there were more women ($MDiff = .26$, $t(259) = 4.12$, $p < .001$) and higher educated individuals ($\chi^2(5) = 21.14$, $p < .001$) in the first sample. However, significant differences in the dependent variables were only found for gender and not for education. Therefore, the samples were merged, and gender was controlled for in all analyses, while participants' sample affiliation was controlled for in analyses involving the psychopathy variable. After data cleaning, including deleting participants who submitted invalid or unreadable data ($n = 83$), or had failed attention tests ($n = 14$), the final sample consisted of $N = 262$ ($n_{sample1} = 66$; $n_{sample2} = 196$) participants, 55% of which were female. On average, participants were 25.38 ($SD = 6.22$) years old, were mostly students (54%) and had obtained some university degree (63%). Participants indicated to be citizens of 36 different regions, with the United Kingdom (21%), the United States of America (15%), and Germany (10%) holding the greatest shares.

Measures

Serial narrative exposure

In order to assess the number of episodes of serial narratives participants had been exposed to, two measurements were used. First, participants were asked to indicate the number of episodes of fictional series they usually watch on a weekday and on a weekend day. To calculate a mean based on the self-reported number of episodes watched, the sum of the week day scores multiplied by five and the weekend day scores multiplied by two was divided by seven to

obtain an average daily series index. According to their own reports, participants watched between 0 and 40 episodes a day ($M = 4.16$, $SD = 4.88$).

Second, participants were asked to upload their Netflix history to provide an observed measure for exposure. Users' histories can be obtained from their Netflix account and will be outputted as a comma-separated values (CSV) file with each row representing a movie or an episode of a series, including the date of watching. Participants were given instructions on how to retrieve their history and asked to upload this file using an anonymous file name created for them. Using a Python script, all Netflix histories were parsed with stable versions of *pandas* (<https://pandas.pydata.org/>) and *numpy* (<https://www.numpy.org/>). In addition, we attempted to add additional metadata for each unique series contained in the Netflix histories. For this purpose, we queried metadata for each series via the Application Programming Interface (API) of the Open Movie Database (OMDb; <https://www.omdbapi.com/>) to obtain the genres associated with each series.

In a next step, we identified and selected only fictional serial narratives from the history, by removing genres that might imply nonfictionality (e.g., documentaries, reality TV, talk-shows) and furthermore removed titles that were non-serial (i.e., movies). In total, participants had watched 84,703 episodes of TV shows ($M = 291.48$, $SD = 345.51$). By far the most popular show was "Friends", with 13,132 watched episodes, followed by "Brooklyn Nine-Nine" with 4,429 watched episodes, and "The Big Bang Theory", with 3,321 watched episodes. Across participants, "Friends" (watched by 41%), "Sherlock" (watched by 35%), and "BoJack Horseman" (watched by 32%) were the most popular series. To avoid skewness due to days on which participants had not used Netflix at all, the average was calculated only considering the days they had at least watched one episode (Range: 1–9.2, $M = 3.21$, $SD = 1.44$). Interestingly, the self-reported measure includes zero while the observed measure does not. This was originally controlled for by introducing filters in the survey to exclude individuals who do not watch Netflix (and would thus indicate 0 episodes). However, those individuals ($n = 7$) who claim to watch zero episodes a week in fact have an observed average of $M = 3.15$ ($SD = 1.10$) episodes per day.

Both measures correlate at $r = .21$ ($p < .001$), speaking for the validity of the objective measure. Further, the vast differences in range support the notion that individuals tend to overestimate their own media use (e.g., Brasel & Gips, 2011), which is why only the observed measure for narrative exposure was used in the main analyses.

Vicarious interactions

The degree to which participants experience vicarious interactions while watching serial narratives was assessed using an adjusted version of a scale designed to measure vicarious experiences during narrative exposure for the purposes of meeting intrinsic needs (boundary expansion scale, see Johnson et al., 2016). Originally, this measure was designed to assess the degree to

which individuals vicariously experience affiliation, agency, and autonomy through written narrative consumption, and consequently expand the boundaries of their selves. Thus, this scale taps into *general* experiences that are different from one's own, which elegantly translates the vicarious aspect into an easily graspable wording that triggers memory of these usually more subconscious processes. Importantly, for the context of this study, we focused on a subset of vicarious experiences that are inherently social, i.e., they focus on experiencing socially-relevant interactions within the mediated environment. These items include, for example, "When you watch series on Netflix, do you usually experience . . . relationships between people that are different from relationships in your own life?" or ". . . do you usually experience what it might be like to relate to others in ways different than you normally do yourself?". Responses were indicated on a 5-item 7-Point Likert scale ranging from 1 (never) to 7 (always) (Cronbach's $\alpha = .79$; $M = 4.62$, $SD = 1.04$)."

Empathy

To assess participants' levels of affective and cognitive empathy, the matching subscales of the Questionnaire of Cognitive and Affective Empathy (QCAE, Reniers et al., 2011) were used. Four of the five subscales which closely reflect the definition of Vossen et al. (2017) were selected. To measure cognitive empathy, i.e., the ability to recognize other individuals' emotions, the 10-item perspective taking subscale was used. To measure affective empathy, i.e. the ability to experience someone else's emotional state, the subscales emotional contagion and proximal responsivity, consisting of four items each, were used. The subscale peripheral responsivity was not included as it directly related to emotional reactions during narrative reception and included an item that relates to cognitive empathy ("It is hard for me to see why some things upset people so much"). Participants indicated their agreement on an 18-item 7-Point Likert scale from 1 (fully disagree) to 7 (fully agree) with items such as "People I am with have a strong influence on my mood" or "It affects me very much when one of my friends seems upset" for affective empathy (10 items, Cronbach's $\alpha = .82$; $M = 5.16$, $SD = .87$), and "I can tell if someone is masking their true emotion" or "I can easily tell if someone else is interested or bored with what I am saying" for cognitive empathy (8 items, Cronbach's $\alpha = .86$; $M = 4.86$, $SD = .95$).

Sympathy

Due to the lack of suitable measurements for adult sympathy following the definition of Vossen et al. (2017), participants' tendency to feel concern and compassion for someone in distress was measured by adjusting the 4-item sympathy scale by Vossen, Piotrowski, and Valkenburg (2015) so that the wording was more suitable for adults. Thus, instead of referring to "friends", "people" or "someone" were used as references. Further, wordings were abstracted to appeal to the more complex minds of adults. Participants indicated their agreement on

a 4-item 7-Point Likert scale from 1 (fully disagree) to 7 (fully agree) with items such as “I feel sorry when I see someone hurting” or “I feel concerned when I witness other people’s misfortunes” (Cronbach’s $\alpha = .86$; $M = 5.56$, $SD = 1.08$).

Hedonic vs. eudaimonic exposure

Similar to the measure of narrative exposure, individuals’ exposure to hedonic as opposed to eudaimonic narratives was determined in two ways. First, the self-report measure developed by Oliver and Raney (2011) to assess hedonic vs. eudaimonic movie preferences was slightly altered to fit the study’s purpose. Thus, formulations such as “I like movies ... ” were changed into “I usually watch fictional series ... ” to assess series selection instead of movie preference. Participant’s agreement was rated on a 12-item 7-point Likert scale from 1 (fully disagree) to 7 (fully agree), with 6 items for hedonic and eudaimonic selection each. Sample items include “I usually watch fictional series that are happy and positive” or “I usually watch fictional series that are simple but enjoyable and funny” for hedonic choices (Cronbach’s $\alpha = .82$; $M = 5.16$, $SD = .87$) and “I usually watch fictional series that make me more reflective” or “I usually watch fictional series that have profound meanings or messages to convey” for eudaimonic choices (Cronbach’s $\alpha = .87$; $M = 5.31$, $SD = .88$).

Second, an observed measure based on the provided Netflix histories was created through obtaining metadata from OMDb. As a proxy for the type of the watched narratives, genres were retrieved from OMDb’s API and attached to each watched episode. Based on the contents usually associated with narratives that elicit either hedonic or eudaimonic responses (Oliver & Raney, 2011), five genres per type were selected. The genres *Comedy*, *Thriller*, *Horror*, *Action*, and *Adventure* were considered hedonic, whereas the genres *Drama*, *Biography*, *Film-Noir*, *Romance* and *Crime* were considered eudaimonic. For each episode, both a hedonic and eudaimonic score reflecting the number of relevant genres was created. Generally, the series watched by participants included more hedonic ($M = 1.03$, $SD = .86$) than eudaimonic genres ($M = .86$, $SD = .79$). Series with high hedonic scores were “Baccano!”, “Teen Wolf”, and “Ben 10”. Series with high eudaimonic scores were “Alias Grace”, “American Crime Story”, and “The Catch”. Using the assigned score, averages for exposure to hedonic and eudaimonic genres were calculated per participant (hedonic: $M = 1.18$, $SD = .48$; eudaimonic: $M = 1.01$, $SD = .42$). The objective values significantly correlated with their self-reported counterparts for eudaimonic exposure ($r = .15$, $p < .05$) but not for hedonic exposure ($r = -.10$, $p = .12$), suggesting that the observed hedonic measure may be problematic. However, given that the eudaimonic component was of primary relevance for hypothesis testing, its observed measure was used in the analyses (note that the results from analyses using the self-reported measure did not differ from the observational measures in direction or magnitude).

Psychopathy

Participants' tendency toward psychopathy was measured using the respective subscale of the Dark Triad Dirty Dozen scale (Jonason & Webster, 2010). Items such as "I tend to be callous or insensitive" or "I tend to lack remorse" were rated on a 4-item 7-Point Likert scale from 1 (fully disagree) to 7 (fully agree) (Cronbach's $\alpha = .69$; $M = 3.08$; $SD = 1.17$).

Alexithymia

To determine participants' ability to recognize and communicate their own emotions, the Toronto Alexithymia Scale (Bagby, Parker, & Taylor, 1994) was used. Items focus on difficulty identifying feelings (e.g., "I am often confused about the emotion I am feeling"), describing feelings (e.g., "I find it hard to describe how I feel about people"), and externally oriented thinking (e.g., reversed: "I find examination of my feelings useful in solving personal problems"), and are indicated on a 20-item 7-Point Likert scale from 1 (fully disagree) to 7 (fully agree) (Cronbach's $\alpha = .88$; $M = 3.58$; $SD = .84$).

Results

Factor analysis of affective empathy and sympathy

Before addressing the main hypotheses, the proposition that affective empathy and sympathy are distinct concepts was tested by conducting a confirmatory factor analysis with two factors and oblique rotation, allowing for correlation between the factors. In support of hypothesis 4, two factors with Eigenvalues greater than 1 were estimated (5.21, 1.38). Further, discriminant validity was acceptable as the correlation between the factors was .59 and thus below the threshold of $r = .80$. The first factor loaded on the eight affective empathy items with good convergent validity (factor loadings: .63 – .90), and explained 43% of the variance, while the second factor loaded on the four sympathy items with good convergent validity (factor loadings: .47 – .73), and explained 12% of the variance. Hence, sympathy and affective empathy were treated as distinct concepts in the following analyses.

Hypotheses testing

In a first step, data were prepared and analyzed using R Studio. Means, standard deviations and zero-order correlations of all variables relevant for hypothesis testing are presented in Table 1. Before testing the hypotheses, all relevant variables were scanned to meet the assumptions of linear regression. As no violations were detected, the final analysis was conducted without bootstrapping. Given that there was a clear theoretical basis as well as multiple dependent variables (Bortz & Schuster, 2010, p. 435), the main hypotheses were tested using structural equation

modeling (SEM). The moderation hypotheses could not be tested using SEM as the required ratio of cases (N) to estimated parameters (q) $N:q = 20:1$ (Jackson, 2003) was not obtainable with the current sample ($N = 262$). Thus, these hypotheses were tested using the SPSS macro PROCESS (Hayes, 2013).

Direct and mediated relationships

To test the main set of hypotheses concerning the direct and mediated relationships between serial narrative consumption and empathy (H1-3), a path model was estimated using maximum likelihood estimation in IBM AMOS 22. Given that women scored higher on the dependent variables (see Appendix B, Table II), gender was added as a control variable in the model. The original model had poor fit, $\chi^2(6) = 120.92$ $p < .001$, CFI = .55, RMSEA = .27, 90% CI [.230, .314]. There were no insignificant paths, the deletion of which could have led to an improved fit, so the modification indices were considered. Several covariances between error terms were suggested, including between affective empathy and sympathy. As this is theoretically valid, the covariance was added, which resulted in a significant chi-square difference test ($\chi^2(1) = 84.10$ $p < .000$), suggesting a better fitting model. The new fit, $\chi^2(5) = 36.82$ $p < .001$, CFI = .876, RMSEA = .16, 90% CI [.111, .205], was better but could still be improved. Modification indices suggested to further add a covariance between affective and cognitive empathy as well as cognitive empathy and sympathy. As this is theoretically valid as well, the covariances were added, which resulted in a significant chi-square difference test, suggesting a better fitting model. In fact, the new model had excellent fit, $\chi^2(3) = .872$ $p = .843$, CFI = 1, RMSEA < .001, 90% CI [.000, .059]. Hence, the remaining hypotheses could be interpreted based on this model (see Figure 1). First, hypothesis 1 suggested that vicarious interactions mediate the relationship between narrative exposure and the respective empathy variables. Supporting this hypothesis, vicarious interactions mediated 98% of the effect between narrative exposure and affective empathy (total indirect effect = .02) and 99% of the effect between narrative exposure and cognitive empathy (total indirect effect = .01), suggesting complete mediation in both cases. Next, hypothesis 2 suggested that narrative exposure leads to more vicarious interactions, which was supported by the data ($\beta = .12$, $b = .09$, $p < .05$). Including

Table 1. Means, standard deviations, and zero-order correlations.

Measure	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Exposure Objective	3.21	1.44	–							
2. Vicarious Interactions	4.62	1.04	.15*	–						
3. Eudaimonic Objective	.20	.10	.02	.14*	–					
4. Psychopathy	3.08	1.17	-.10	-.08	-.11	–				
5. Alexithymia	3.58	.84	.04	-.04	-.06	.37***	–			
6. Affective Empathy	4.86	.95	.13*	.29***	.13*	-.37***	-.06	–		
7. Cognitive Empathy	5.16	.87	.06	.24***	.14*	-.21**	-.24***	.44**	–	
8. Sympathy	5.56	1.08	.11	.26***	.11*	-.55**	-.21**	.61***	.33***	–

$N = 262$. Likert scales 1–7, except for objective measures (1 and 3). * $p < .05$, ** $p < .01$, *** $p < .001$.

gender as a control ($\beta = .18, b = .37, p < .01$), 5.1% of the variance in vicarious interactions was explained. Hypothesis 3 suggested that the more vicarious interactions individuals experience during exposure, the higher they will score on affective (a) as well as cognitive empathy (b). In support of this hypothesis, vicarious interactions positively predicted both affective ($\beta = .23, b = .21, p < .001$) and cognitive empathy ($\beta = .19, b = .16, p < .01$), and the model explained 18.5% of the variance in affective and 10.2% in cognitive empathy. Finally, research question 1 asked how sympathy was related to exposure to serial narratives through vicarious interactions. Vicarious interactions positively predicted sympathy ($\beta = .19, b = .20, p < .001$), and the model explained 16.7% of the variance in sympathy. Further, vicarious interactions completely mediated the relationship between exposure to serial narratives and sympathy (100%, total indirect effect = .02).

Moderated relationships

The second set of hypotheses (H5–7) concerned fostering and dampening moderators to the proposed relationships of the main hypotheses. These effects were tested using PROCESS’ Model 1 (see Table 2). First, hypothesis 5 predicted that for individuals who prefer eudaimonic entertainment, the relationship between watched episodes and vicarious interactions would be stronger. Although objective eudaimonic exposure was a strong predictor for vicarious interactions ($b = .31, 95\% \text{ CI } [.198, .425]$) the bias-corrected confidence interval of the interaction with watched episodes included zero ($b = .004, 95\% \text{ CI } [-.083, .091]$), leading to the rejection of the hypothesis. Further, hypothesis 6 suggested that for individuals high in psychopathy, there would be no relationship between

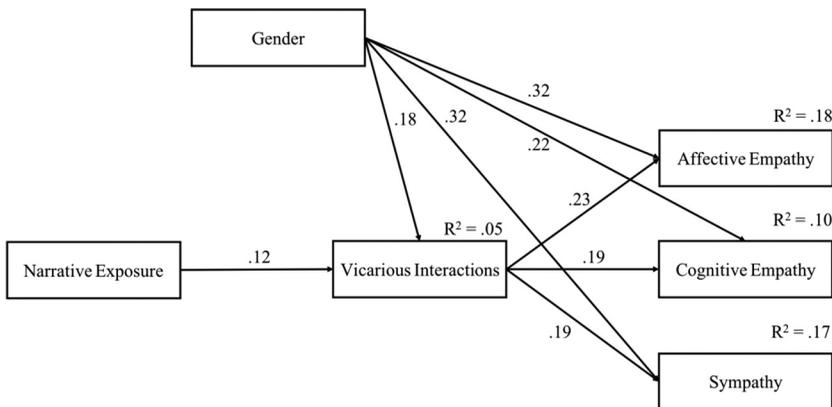


Figure 1. Maximum likelihood estimation path model. $N = 262$. Model fit: $\chi^2(3) = .872, p = .843$, CFI = 1, RMSEA < .001, 90% CI [.000, .059]. Paths are significant at $p < .05$. For reasons of parsimony, covariances and error terms are not drawn. Narrative exposure and gender covaried at $r = .15$, the error terms of affective and cognitive empathy covaried at $r = .36$, the error terms of affective empathy and sympathy covaried at $r = .53$, the error terms of cognitive empathy and sympathy covaried at $r = .23$.

vicarious interactions and affective empathy. Given that both samples differed with regard to their psychopathy scores, sample affiliation was added as a covariate. Yet, it did not reach significance ($b = .05$, 95% CI $[-.191, .293]$) and was thus dropped from the final analysis. As expected, psychopathy was a negative predictor of affective empathy ($b = -.24$, 95% CI $[-.325, -.150]$), however, its interaction with psychopathy ($b = .005$, 95% CI $[-.045, .117]$) was insignificant, and the hypothesis was rejected. Finally, hypothesis 7 predicted that for individuals high in alexithymia, there would be no relationship between vicarious interactions and cognitive empathy. Although alexithymia was a strong negative predictor of cognitive empathy ($b = -.21$, 95% CI $[-.323, -.103]$), its interaction with vicarious interactions was insignificant ($b = -.07$, 95% CI $[-.187, .044]$), leading to the rejection of this hypothesis.

Discussion

The aim of this study was to explore whether the role of exposure to serial audiovisual narrative fiction predicts empathy via vicariously experiencing the interactions portrayed in the series. Further, both amplifiers as well as attenuators of this relation were considered. While hypotheses concerning the mediating role of vicarious interactions were supported, no moderated relationships were found.

Table 2. Simple moderation analyses of the predictors of vicarious interactions, affective empathy and cognitive empathy. Confidence intervals and standard errors based on 5000 Bootstrap samples. Predictors centered.

	<i>b</i>	<i>SE</i>	<i>t</i>	<i>CI</i>
Vicarious Interactions				
Constant	4.432	.095	46.700***	[4.245, 4.620]
Gender	.345	.129	2.684**	[.092, .598]
Eudaimonic Exposure	.320	.161	1.989*	[.003, .636]
Episodes	.096	.045	2.148*	[.008, .185]
Interaction Eud x Exp	.014	.116	.121	[-.214, .242]
<i>R</i> ²	.263			
<i>F</i>	4.720***			
Affective Empathy				
Constant	4.622	.078	59.243***	[4.467, 4.775]
Gender	.457	.106	4.293***	[.247, .666]
Psychopathy	-.238	.044	-5.357***	[-.325, -.150]
Vicarious Interactions	.195	.049	3.957**	[.098, .293]
Interaction VI x Psych	.034	.042	.801	[-.050, .117]
<i>R</i> ²	.263			
<i>F</i>	22.658***			
Cognitive Empathy				
Constant	4.959	.075	65.823***	[4.811, 5.108]
Gender	.356	.102	3.494***	[.155, .557]
Alexithymia	-.213	.056	-3.816***	[-.323, -.103]
Vicarious Interactions	.151	.049	3.118**	[.056, .247]
Interaction VI x Alex	-.072	.057	-1.220	[-.187, .044]
<i>R</i> ²	.162			
<i>F</i>	12.288***			

N = 262. All significance tests were conducted at an alpha-level of .05. * $p < .05$, ** $p < .01$, *** $p < .001$.

The first set of hypotheses concerned the relationships between exposure to serial audiovisual fiction, vicarious interactions, and empathy and sympathy. In support of the core assumption of this paper, an indirect effect was found. Exposure to serial audiovisual fiction predicted vicarious interactions, which in turn predicted both affective and cognitive empathy, suggesting that this mechanism is responsible for general increases in empathy induced via narrative fiction. This finding reflects research on empathy, which suggests that empathy is developed through social interactions (Preston & de Waal, 2002). Analogously, SCT (Bandura, 2001) asserts that any learning, including emotional learning, can occur vicariously, and adds valuable insights into research on the processes through which media exposure may facilitate empathy. While scholars focusing on written fiction have emphasized the necessity of the application of empathic skills to understand the narrative and thus improve them with time (e.g., Kidd & Castano, 2013), as well as the capacity to build up social knowledge (e.g., Vezzali, Stathi, Giovannini, Capozza, & Trifiletti, 2015), the process of vicarious interactions has been neglected. The fact that vicarious interactions fully mediated the effects of exposure on empathy in this study underlines their importance for empathic development. Moreover, previous work on the relationship between empathy and fiction reading has measured individuals' degree of fiction reading via author recognition tests (Mar et al., 2006; Stanovich & West, 1989). In this sense, our study presents an innovation by directly measuring individuals' narrative consumption as indexed by observed Netflix viewing histories.

Our study followed research by Vossen et al. (2017) by considering empathy and sympathy as unique constructs. In support of this distinction, a factor analysis suggested two different factors with loadings on the corresponding items of each concept. Yet, they were highly correlated and their relations to the other variables were of similar direction and strength. Thus, although there may be a statistical difference between these constructs, their distinction did not meaningfully contribute to our understanding of how exposure to serial narratives impacts an individual's sociability. However, there may be an issue with the proposed relationship between affective empathy and sympathy. While Vossen et al. (2017) suggest that affective empathy and sympathy are distinct, coexisting constructs, Reniers et al. (2011) suggest that sympathy may in fact be an outcome of affective empathy. This study's findings provide preliminary support for this assumption, although more research is needed to draw definite conclusions about causality.

The second set of hypotheses suggested several moderators that would either increase or decrease the proposed mediated effect of narrative exposure on empathy. First, it was suggested that the more eudaimonic media individuals consume, the more vicarious interactions they experience, as eudaimonic media usually offer a greater spectrum of such interactions. However, this proposition was not supported by the data. Interestingly however, exposure to eudaimonic media directly related to vicarious interactions ($\beta = .32$, $b = .30$, $p < .001$) as well as both empathy

components (affective: $\beta = .19$, $b = .17$, $p < .001$; cognitive: $\beta = .29$, $b = .24$, $p < .001$). Although these direct relationships were not originally hypothesized, it is a highly important finding: It suggests that not the quantity of narrative exposure, but its quality may enable empathy. In other words, it may not be important how often one experiences vicarious interactions through narrative fiction, but how meaningful and emotionally challenging those interactions are. Future research should explore this notion by exposing individuals to either eudaimonic or hedonic media and compare their respective empathy levels. Likewise, hedonic and eudaimonic entertainment experiences when processing political entertainment media. Such findings may be especially useful to practitioners who treat individuals who struggle with empathy and may require advice on their media diets.

Finally, two moderators which could impair the impact of vicarious interactions during exposure to narrative fiction on empathy were considered. Yet, no moderated relationships were found. Speaking for the quality of the data, however, both psychopathy and alexithymia negatively related to affective and cognitive empathy, respectively, which reflects previous findings on dampening factors of empathy (e.g., Jonason & Krause, 2013; Wai & Tiliopoulos, 2012). Thus, these pathological character traits neither prevent nor promote the effect of vicarious experiences on empathy.

In sum, this study's findings suggest that vicarious interactions during exposure to audiovisual narrative fiction foster both affective and cognitive empathy. Further, eudaimonic media appear to be more suitable than general media to predict empathy directly. Finally, negative character traits did not interfere with this relation.

Limitations and directions for future research

This study has provided valuable insights into the relationship of narrative fiction and empathy, and the mechanisms involved. Yet, there are some limitations to this research. While innovative, the content-specific Netflix measures concerning media exposure also have shortcomings. First, the observed measure of exposure to narratives only reflects series consumed on Netflix. Thus, series that have been watched via other providers are not part of this measurement and conclusions outside of this particular, yet common, medium cannot be drawn. In addition, while we asked participants to upload the viewing history of their primary personal account, we cannot rule out that this account has been used by another person. However, as Netflix affords the creation of multiple "profiles" per account to ensure personalized content recommendations, we consider these scenarios to be rare. Likewise, future studies should complement measures of audiovisual serial narrative consumption with supplemental measures of other media use such as fiction reading or listening to audiobooks. Here, experience sampling methods (e.g., Reinecke & Hofmann, 2016) may be particularly promising to capture a more holistic picture of individuals' narrative consumption. Analogously, Netflix viewers may not be representative of the overall media user population and thus,

generalizations of our findings to other audiences cannot be guaranteed. Second, the observed measure for entertainment type can be improved as it was purely based on the genres attributed by OMDb. Even though the respective genres were chosen based on research, some choices may still be arbitrary. For example, the genre *Action* was selected as a hedonic indicator. While this may be true for series such as “Lethal Weapon”, series such as “Prison Break” are also considered action and thus hedonic, even though they entail many meaningful interactions. In other words, specific genres can elicit both hedonic and eudaimonic responses and may thus not be the most suitable choice to determine entertainment types. Thus, future research should develop a more fine-grained criterion for distinguishing eudaimonic from hedonic contents.

Additionally, our measurement of vicarious interactions modified the original application of the boundary expansion scale (Johnson et al., 2016) in two aspects: First, we applied the scale to audiovisual, rather than textual narratives; second, we asked participants to recall how frequently they *generally* experience vicarious interactions when watching series on Netflix, compared to assessing these experiences immediately after exposure. Thus, additional research is needed to further validate the application of this scale in more naturalistic, long-term contexts.

Furthermore, the cross-sectional design of this study inhibits conclusions about causality, even though causality is suggested by the theoretical rationale. It may in fact be possible that vicarious interactions or exposure to eudaimonic entertainment do not increase empathy, but that empathic individuals tend to experience more vicarious interactions as they more easily identify with the characters. Yet, given that empathy is difficult to manipulate, the question concerning preferences for eudaimonic entertainment may be harder to assess. Simply using a quasi-experimental design in which participants are divided into high and low empathy levels seems inappropriate as it would still be possible that their previous exposure to certain media has impacted their development of empathy. To get a first impression of preferences, however, a classifier based on the current data could be built to determine which series or movies individuals high or low in empathy consume. Although this would still not answer the question concerning directionality, it would be a valuable first step toward better understanding the role of empathy in entertainment choices.

This paper proposes that serial narratives are especially suitable to increase empathy as the engagement with characters and interactions may be deeper due to the prolonged and continuous exposure. Yet, no actual comparison could be drawn as movies or other types of series were not included in the final data set. Therefore, future research should consider additional types of entertainment to determine which specific formats facilitate empathy, and thus draw a more conclusive picture of the media’s role in the development of empathy. Likewise, future studies may examine how prolonged exposure to serial narratives (cf. binge-watching; Pittman & Sheehan, 2015) is conducive to

narrative immersion and thus may modulate effects of narrative exposure on viewers' social cognition.

Concluding, this paper provides valuable insights into the mechanism through which fictional, serial audiovisual narratives enhance empathy. By vicariously experiencing social interactions, individuals can increase their ability to recognize and share someone else's feelings. Finally, this study suggests that it may not solely be the quantity of exposure that shapes empathy, but the eudaimonic quality of the displayed symbolic interactions.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

S. Rohm  <http://orcid.org/0000-0003-0720-8982>

F. R. Hopp  <http://orcid.org/0000-0002-0866-064X>

E. G. Smit  <http://orcid.org/0000-0002-6913-4897>

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