

Enriching research of parasocial experiences through better measurement of parasocial processing (PSP): The PSP short inventory

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Abstract

Amid growing scholarly calls highlighting the theoretical importance of parasocial processing (PSP) for enabling closer accounts of users' cognitive, affective, and conative reactions to media characters, communication research lacks a comprehensive short survey instrument for capturing PSP. The article overcomes this gap by introducing the PSP Short Inventory – a parsimonious short-scale measuring PSP as a multifaceted concept with nine items. Building on existing theory, PSP and its three components of cognitive, affective, and conative PSP are defined and conceptualized. A selection of items was derived to start the scale development, which then progressed through three preregistered studies (with 500 participants each). The analyses of the three studies combined exploratory and confirmatory factor analysis, and covered various reliability analyses and analyses of discriminant, convergent, and nomological validity. Based on the three studies, we find strong empirical evidence that the PSP Short Inventory provides a valid, reliable, and practicable PSP measure for future parasocial research. The theoretical and methodological advances enabled by the measure are discussed.

Keywords

parasocial processing, parasocial experiences, parasocial interaction, parasocial relationships, survey research, scale development, validity, reliability, short scales

1 Introduction

Investigating parasocial experiences with media characters has a long tradition in media and communication research (Horton & Wohl, 1956)¹. It has increasingly permeated various subfields like audience research (e.g., Hartmann, Reinecke, & Oliver, 2016), entertainment (e.g., Rosaen & Dibble, 2017), persuasion and advertising (e.g., Jin & Ryu, 2020), or health communication (e.g., Hoffner & Cohen, 2023). Meanwhile, one downside of the growing popularity of research on parasocial experiences has been its fragmen-

tation, as seen in other communication research areas (Boster, 2023). Due to divergent theoretical definitions, ambiguous conceptualizations, and incoherent measures, scholars have agreed on the need for a better theoretical framework and empirical operationalization as focal challenges (e.g., Dibble, Hartmann, & Rosaen, 2016; Giles, 2002; Liebers & Schramm, 2019). One research avenue has been the study of parasocial processing (PSP). By covering users' cognitive, affective, and conative involvement with media characters, PSP promises to synthesize and directly relate the main foci to what has often been considered the core of parasocial experiences: users' reactions to media characters during or in the intermediate aftermath of media exposure (Hartmann et al., 2016; Schramm & Hartmann, 2008). In this paper, we follow

1 We follow researchers using the term “parasocial experiences” for describing different types of user reactions to media characters broadly (Tukachinsky Forster, 2023).



recent parasocial research by using the term media character to refer broadly to any persona featured in mediated content, including both fictional and non-fictional characters (Liebers & Schramm, 2023). This reflects the field's conceptual expansion beyond Horton and Wohl's (1956) original focus on personae in mass media content such as TV hosts and newscasters.

Although the study of PSP is a scientifically and practically relevant endeavor, the question of how to translate its conceptual definition into empirical measurement remains a considerable challenge (Dibble, Tukachinsky, Forster, Guzaitis, & Downey, 2023). Schramm and Hartmann (2008) provided a starting point by operationalizing parasocial interactions “as parasocial processing” (p. 387), but their measure comprises 112 items, making it impractical in applied research and interfering with the general requirements of collecting high-quality data (Birkenmaier et al., 2024; Groves, 2011). Scholars must select item subsets without clear theoretical guidance, methodological justification, and empirical grounding – adding concerns about research comparability (Dibble et al., 2023). Indeed, the factorial structure of PSP has never been validated. This represents a critical measurement gap because any comprehensive investigation of the determinants and effects of phenomena presupposes that the empirical measures accurately capture what they are theoretically supposed to capture (Mangold, 2024; Strömback et al., 2020).

The present paper overcomes these research gaps by developing the *PSP Short Inventory*. Building on prior PSP research, we derive our scale from three pre-registered empirical studies. We follow the contemporary methodological viewpoint that comprehensive scale development requires replicating and refining scales' psychometric properties across multiple studies (e.g., Cohen, 2003; Tukachinsky, 2011). Statistically, we adhere to the state-of-the-art by combining exploratory with confirmatory factor analysis (see also, e.g., Boyd, Rocconi, & Morrow, 2024; Tukachinsky, 2011). Accordingly, we do not consider PSP and its factorial structure in isolation but disentangle them within the broader nomological framework of parasocial research.

1.1 Defining and conceptualizing parasocial processing

Many scholars have agreed that PSP can be broadly understood as “the degree to which the individual interacts psychologically with a media character” (Schramm & Hartmann, 2008, p. 388). Recent literature has accentuated four defining features of PSP. First, PSP encompasses various psychological processes, ranging from users' attention to media characters to more elaborate processing of emotional and behavioral responses (Hartmann, 2008). Second, by specifically setting in “immediately and rather automatically once a persona is encountered” (Schramm & Hartmann, 2008, p. 388), PSP aids in overcoming a focal gap in parasocial research. This most prominently applies to research on parasocial interactions (i.e., users' feelings of being in an interaction with a media character during exposure; Hartmann & Goldhoorn, 2011; Horton & Wohl, 1956). While extant studies have relied on Rubin and colleagues' (Rubin & Perse, 1987; Rubin, Perse, & Powell, 1985) parasocial interaction scale, their scale actually measures more long-term relationships with media characters better described as parasocial relationships (Dibble et al., 2016). Similarly, identification describes a strong relationship and merging with a media character (Cohen, 2001). Third, PSP is concerned with users' reactions to media characters rather than – as is the case with concepts like transportation (Green, Brock, & Kaufman, 2004) – their media content processing. Finally, PSP is a multifaceted and inherently three-fold concept (Klimmt, Hartmann, & Schramm, 2006). Instead of constituting a single factor, and similar to other complex concepts such as attitudes (van Harreveld, Nohlen, & Schneider, 2015), PSP comprises three related yet distinct components: cognitive, affective, and conative PSP.

1.2 Cognitive, affective, and conative PSP

Cognitive PSP encompasses processes linked to thinking about a character. Cognitive PSP occurs when users concentrate their attention on a character during an instance of media exposure, but it is not restricted to these moments of concentration (Klimmt et al., 2006). Rather, users' knowledge is essential, such that they intensively think about characters and their actions. This thinking is not restrict-

ed to previous actions but also integrates considerations of how this character will evolve (Schramm & Hartmann, 2008). Notably, comparisons between self and persona have been discussed in the context of PSP's cognitive component (e.g., Hartmann, Schramm, & Klimmt, 2004; Klimmt et al., 2006). Since such comparisons mostly only occur when users maintain strong affective relations with media characters (Dibble et al., 2016), they likely cover cognitive and affective processing, and not only purely cognitive PSP.

Affective PSP refers to the emotional reactions that media characters trigger in users. Users feel emotions similar to or the same as the characters (Klimmt et al., 2006). These emotions may be positive or negative (Tukachinsky, Forster, & Click, 2023); for instance, users feel happiness or sadness in response to a happy or sad character. Such a transfer of emotions does not presuppose cognitive engagement. In the sense of mood contagion, it is an automatic process (Schramm & Hartmann, 2008). At the same time, affective processing prototypically translates into empathy (Hartmann et al., 2004).

Conative PSP concerns behavioral reactions to a mediated encounter with a character (Schramm & Hartmann, 2008). What separates these reactions from other types of media-related behaviors (e.g., next-day follow-up talk) is that these behaviors are direct reactions to the character's behaviors that occur during or in the immediate aftermath of media exposure (Klimmt et al., 2006). Conative PSP requires actual behavior and not only the intention to behave. It frequently refers to spontaneous or impulsive behaviors, the nature of which may be verbal (i.e., shouting at the character) or nonverbal (i.e., mimicking or gestures; Hartmann et al., 2004).

How the components of multifaceted concepts like PSP are defined is one important matter; how these components are related to each other is another, both on theoretical grounds and from the methodological viewpoint of scale development and validation.

1.3 Associations between PSP components

Because cognitive, affective, and conative PSP do not represent entirely unrelated phenomena but share the theoretical notion of users reacting to media characters, they should be

positively correlated throughout. Still, the correlations between the PSP components should remain far from perfect (i.e., substantially weaker than 1), given their theoretical nature as “building blocks” (Klimmt et al., 2006, p. 297) of PSP that do not inevitably co-occur (Schramm & Hartmann, 2008). This particularly applies to affective and conative PSP, such that high affective PSP neither necessarily presupposes nor implies high conative PSP or vice versa (Klimmt et al., 2006). At the same time, there is a theoretical reason to expect both affective and conative PSP to be more strongly associated with cognitive PSP than with each other, as both presuppose at least a minimum degree of cognitive engagement – particularly user attention to the media character (Klimmt et al., 2006).

In light of these theoretical considerations from previous literature, we follow the methodological view that scale development needs to go beyond accounts of factorial validity, which have often only inspected the number of emerging factors and item loadings (e.g., Abdulla, Garrison, Salwen, Driscoll, & Casey, 2004). When coping with multifaceted concepts like PSP, it is essential to consider how their components are related to each other (e.g., Kline, 2005; Prochazka & Schweiger, 2019). Accordingly, our first set of theoretical reference hypotheses (i.e., measurement propositions [P]) is:

- › P1: The associations of cognitive, affective, and conative PSP are positive throughout.
- › P2: The associations of cognitive, affective, and conative PSP are imperfect throughout (i.e., below 1).
- › P3: Affective PSP and conative PSP are less strongly associated with each other than with cognitive PSP.

While positive associations between PSP components yield methodological evidence for convergent validity (P1), their being significantly less than perfect (P2) supports discriminant validity, and the weaker association between affective and conative PSP (compared to their associations with cognitive PSP) supports nomological validity (P3) (Fornell & Larcker, 1981; Hair, Black, Babin, & Anderson, 2010; Yale, Jensen, Carcioppolo, Sun, & Liu, 2015), a related theoretical and methodological case can be made for the PSP

components' associations with other concepts of parasocial experiences.

1.4 Associations of PSP components with other concepts

Since PSP is supposed to play an integrative role in parasocial research, its associations with other concepts of media character and content processing should generally be positive. These associations' strength should be sensitive to other foci, such that concepts foregrounding users' affective involvement should be foremost associated with affective PSP, concepts foregrounding cognitive involvement foremost with cognitive PSP, and concepts accentuating behavioral involvement foremost with conative PSP.² To illustrate the rationale, consider parasocial relationships (PSR). Because PSR describes users' positive or negative relationships with media characters (Dibble et al., 2016), it is theoretically plausible that PSR should be more strongly associated with affective PSP than with cognitive and conative PSP. Notably, the same pattern of associations can be expected for Rubin et al.'s (1985) parasocial social interaction scale (R-PSI) since it has been proven to measure PSR (Dibble et al., 2016). We expect that:

- › P4: PSR is more strongly associated with affective PSP than with cognitive PSP and conative PSP.
- › P5: R-PSI is more strongly associated with affective PSP than with cognitive PSP and conative PSP.

Two other core concepts of media character and content processing are identification (Cohen, 2001) and transportation (Green et al., 2004). Since identification occurs when users merge and role-take with a character, it involves a cognitive emphasis. Still, both concepts share the theoretical notion of a connec-

tion between users and media characters. Affective processing is essential to identification, facilitating users' character merging (Cohen, 2001). Thus, a similar pattern of associations is expected (i.e., stronger association with affective PSP than with cognitive and conative PSP). Transportation is more specifically concerned with users' reactions to media content. Still, because transportation refers to users' cognitive engagement with the narrative (Green et al., 2004), it should be more strongly associated with cognitive PSP than with affective and conative PSP.

- › P6: Identification is more strongly associated with affective PSP than with cognitive PSP and conative PSP.
- › P7: Transportation is more strongly associated with cognitive PSP than with affective PSP and conative PSP.

Since Rubin and colleagues' parasocial interaction scale (R-PSI; Rubin & Perse, 1987; Rubin et al., 1985) does not capture PSI but PSR (Dibble et al., 2016), scholars have developed more effective measures for restoring the definitional core of PSI: users' illusion of being in a mutual exchange with media characters (Horton & Wohl, 1956). These illusions are most likely when user reactions are observable and behavioral in nature (Hartmann & Goldhoorn, 2011).

- › P8: PSI is more strongly associated with conative PSP than with affective and cognitive PSP.

Finally, it is important to consider that PSR, R-PSI, and identification are conceptually more closely related to PSP than transportation, as the former concepts emphasize media users' engagement with media characters. In contrast, transportation concerns users' immersion in media content rather than specific characters (Green et al., 2004) and should therefore be less strongly associated with cognitive PSP than PSR, R-PSI, and identification are with affective PSP. Similarly, PSI may be less strongly associated with conative PSP than transportation is with cognitive PSP, as PSI primarily involves the illusion of reciprocal interaction, whereas conative PSP captures users' actual behavioral responses –

2 The circumstance of an individual PSP component specifically showing the strongest associations with those concepts it is theoretically supposed to show the strongest associations which yields evidence for convergent validity of the PSP component's measurement and discriminant validity from the measures for other PSP components (see also Frijda, Kuipers, & ter Schure, 1989; Nabi, 2002; Otto, 2018).

such as mimicry or verbal expressions – that can occur even in the absence of such an illusion. Moreover, since it is mostly a misperception that media characters observe and respond to users' reactions, there should be various instances when users engage in conative PSP without necessarily engaging in PSI (Schramm & Hartmann, 2008).

- › P9: Transportation is less strongly associated with (cognitive) PSP than PSR, R-PSI, and identification with (affective) PSP.
- › P10: PSI is less strongly associated with (conative) PSP than transportation with (cognitive) PSP.

Together, these final propositions examine how PSP relates to conceptually adjacent constructs and test the relative strength of these associations across PSP's three components.³

1.5 Toward a validated short scale for measuring PSP

While Schramm and Hartmann (2008) proposed 112 items to measure PSP, we add to the literature by providing shorter scales in parasocial research (e.g., Cohen, 2001; Hakim & Liu, 2021; Hartmann & Goldhoorn, 2011). This is important, e.g., to save survey time or enhance data quality by reducing participant burden (Ziegler, Kemper, & Kruiyen, 2014). While short scales should be as brief as possible, we acknowledge that some scales have captured complex multidimensional concepts (like Big Five personality traits) with only two items per component or even a single one (e.g., Gosling, Rentfrow, & Swann, 2003; Muck, Hell, & Gosling, 2007; Rammstedt & John, 2007). Yet, we followed research that aimed at three items per component (e.g., Chang et al., 2011; Nießen, Beierlein, Rammstedt, & Lechner, 2020) to capture cognitive, affective, and conative PSP with sufficient theoretical breadth. On the methodological side, operating with three items per component has the advantage that core reliability statistics (i.e., Cronbach's Alpha, Average Variance Extracted) are only defined

for scales with more than two items (Bagozzi & Baumgartner, 1994; Hair et al., 2010).

While following Schramm and Hartmann (2008) by initially including a larger number of items for cognitive than for affective and conative PSP, our scale development adapted and expanded their methodological framework in four key respects: (A) We began our scale development with a theoretically derived preselection of 24 items, chosen from the original 112-item pool based on conceptual coverage of all three PSP components, face validity, and independent review by three authors familiar with parasocial theory. (B) We streamlined the items' wording to prevent factors that emerge due to semantic variations. (C) We dropped or adapted items identical to concepts like PSR/PSI to prevent correlations due to item similarity (Dibble et al., 2023). (D) We establish validity and reliability over three consecutive studies, combine exploratory with confirmatory factor analysis, and locate PSP within the nomological framework of parasocial research. Across all three studies, item retention decisions were guided by both theoretical fit and empirical performance, allowing us to iteratively narrow the item pool to a psychometrically robust and conceptually comprehensive 9-item inventory.

In conjunction, the theoretical reflections and methodological considerations led us to derive nine items for assessing users' cognitive PSP (Table 1). These items measure subfacets of users' concentrating their attention on the character (Items 1–3), users' elaboration of the character's situations and actions (Items 4–6), and users' thinking about the character's future (Items 7–9). Despite, or precisely because, we wanted to substantiate our assertion that comparisons between users and characters require some affective PSP and do not directly indicate cognitive PSP, we tentatively included three items for such comparisons (Items 10–12). To operationalize affective PSP, we included six items covering users' emotional processing of a character. More specifically, subfacets of users' experiencing the character's emotions (Items 13–14), their feelings being influenced by the character's mood (Items 15–16), and users' compassion for the character (Items 17–18). Finally, because conative PSP describes users' verbal and nonverbal reactions to a mediated

³ An overview of all reference propositions, including the empirical studies in which they were tested, is provided in Table S18 in the Supplementary Materials.

Table 1: 24-item pool for measuring parasocial processing

While watching, ...
1) I focused my attention on CHARACTER.
2) I watched closely what CHARACTER said or did.
3) I watched closely how CHARACTER behaved.
4) I tried to understand the acts of CHARACTER.
5) I intensely thought about CHARACTER's behavior.
6) I thoroughly thought about what CHARACTER did.
7) I often tried to guess what CHARACTER might say next.
8) I had ideas about how things would develop for CHARACTER.
9) I thought about what could happen to CHARACTER
10) [I thought about what connects me with and what distinguishes me from CHARACTER.]
11) [I sometimes compared CHARACTER's thoughts to mine.]
12) [I thought about if I would do things like CHARACTER or not.]
13) I sometimes felt the same emotions as CHARACTER.
14) I could feel the emotions CHARACTER showed.
15) CHARACTER's feelings were contagious to my feelings.
16) CHARACTER's feelings influenced my own mood.
17) I felt compassion for CHARACTER.
18) I felt empathy for CHARACTER.
19) I reacted to CHARACTER's behavior with my facial expression.
20) CHARACTER's behavior triggered my facial expression.
21) At certain moments, I said something to CHARACTER.
22) I commented out loud on CHARACTER's behavior.
23) I sometimes gestured towards CHARACTER.
24) CHARACTER's behavior led me to gesture at him/her.

Note: Solid lines signify the distinction between items aimed at cognitive, affective, and conative PSP, and comparisons between self and media character; dashed lines the distinctions between items aimed at subfacets. Items aimed comparisons between self and character were put in brackets due to our expectation that such comparisons are not indicative of cognitive PSP because they presuppose affective PSP.

encounter, we included six items that disentangled users' mimicry (Items 19–20), users' verbal responses to the character (Items 21–22), as well as physical gestures triggered by the character (Items 23–24).

2 Study I

Study I aimed to provide an empirical starting point for developing and validating the PSP Short Inventory. Its primary goal was: (a) to establish whether and how the 24-item pool encapsulates the theoretical distinction between cognitive, affective, and conative PSP, and

(b) to determine which item subsets are best suited for measuring each PSP component.

2.1 Materials and methods

The research design of Study I was preregistered on OSF (<https://osf.io/mg3dn>) and ethically approved by the *Institutional Review Board* of the University of Fribourg (No. 2022-11-01). Data and material (R-code, survey items) are openly available (<https://osf.io/85aqf>).⁴

⁴ The preregistration and all materials, data, and analysis scripts for Studies I–III are also compiled in an overall OSF project: <https://osf.io/8tavn>.

2.1.1 Procedure and sample

An online survey was administered to 500 US participants recruited via the *prolific* platform in November 2022, using gender, age, and ethnicity quotas representative of the US (US Census Bureau, 2024). The sample size of $N=500$ was determined based on common methodological guidelines for exploratory and confirmatory factor analysis, which recommend sample sizes of at least 300–500 to ensure stable factor solutions and model convergence (Comrey & Lee, 2013; Kyriazos, 2018; MacCallum, Widaman, Zhang, & Hong, 1999; Worthington & Whittaker, 2006). Participants received a small monetary incentive (\$2.32); 500 participants were iteratively recruited. The data were cleaned using three criteria (completion time, attention checks, and self-reported data quality). One participant was excluded due to failed attention checks. Table S1 in the Supplementary Materials (SM) shows that the sample generally matched the population parameters well. Participants had a mean age of 46.0 years ($SD=16.5$, $MIN=18$, $MAX=89$), 52% were female, and 48% were male. Older adults aged 75 and above were underrepresented, while individuals aged 25 to 64 were slightly overrepresented. White participants were overrepresented, whereas individuals identifying as mixed or other ethnicities were underrepresented.

2.1.2 Measures

To assess participants' PSP, we administered the full 24-item pool to all participants in randomized order (for sample descriptives, see SM Table S3). Responses were captured with a 5-point Likert scale ranging from 1 ("do not agree at all") to 5 ("agree completely"). A 5-point Likert scale was chosen based on its frequent use in prior parasocial research (e.g., Cohen, 2003; Dibble et al., 2017; Hartmann & Schramm, 2008; Rubin et al., 1985) and its methodological advantages of capturing gradual differences in PSP, providing sufficient variance, while maintaining manageable respondent burden (Krosnick & Fabrigar, 1997; Lozano, García-Cueto, & Muñiz, 2008; Preston & Colman, 2000; Weng, 2004). Before administering the PSP items, the participants were confronted with a recall cue, which is commonly applied in parasocial research (e.g., Dibble et al., 2023;

Liebers & Schramm, 2019). The participants were asked to recall a character from a series or movie with which they had previously engaged. Then, they were instructed to recall a specific exposure situation. They had to describe this situation in an open text field to activate their memories. Participants were randomly assigned to a recall cue to capture the full range from low- to high-intensity PSP. These cues varied regarding two aspects: the *valence* of users toward the media character (liked vs. neutral vs. disliked) and the intensity of *engagement* with the character (low vs. medium vs. high; see Table S2 for all recall cues). For example, one participant might have received the cue: "While you were watching the media content, you strongly engaged with this media character, and you like this media character." This approach was chosen to prevent recall biases because when participants are free to choose a character, they often choose their favorite characters (e.g., Cohen, 2004; Hartmann et al., 2016). The characters recalled in Study I were predominantly fictional (89%), male (65%), and from series (76%), with the remaining from films (23%) and a relatively small proportion being non-fictional (11%).

2.1.3 Analysis

Considering the lack of previous empirical evidence on the factorial structure of PSP, Study I used exploratory factor analysis (EFA) to determine: (a) how many factors are captured and whether these factors reflect the theoretically acclaimed distinction between cognitive, affective, and conative PSP; (b) which item subsets are most suitable for a short inventory assessing PSP briefly and with sufficient breadth. We refrained from the traditional – and often criticized (Kohring & Matthes, 2007; Yale et al., 2015) – data-driven approach of merely selecting those items with the highest factor loadings (e.g., Items 13, 17, and 18 for affective PSP; see Table 2) but additionally pondered the theoretical definitions to ensure that each PSP component's sub-factors are adequately covered.⁵

5 The empirical emphasis on factor loadings remains relevant because they reflect how much measurement error items comprise or how closely they represent the PSP components.

Table 2: Exploratory factor analysis of parasocial processing

Item	Factor		
	Cognitive	Affective	Conative
1) I focused my attention on CHARACTER.	.63	.20	-.03
2) I watched closely what CHARACTER said or did.	.76	.05	-.05
3) I watched closely how CHARACTER behaved.	.83	.00	-.02
4) I tried to understand the acts of CHARACTER.	.59	.31	-.16
5) I intensely thought about CHARACTER's behavior.	.65	.01	.19
6) I thoroughly thought about what CHARACTER did.	.79	.01	.04
7) I often tried to guess what CHARACTER might say next.	.26	.23	.31
8) I had ideas about how things would develop for CHARACTER	.58	.14	.05
9) I thought about what could happen to CHARACTER.	.77	.02	-.03
10) I thought about what connects me with and what distinguishes me from CHARACTER.	.32	.22	.26
11) I sometimes compared CHARACTER's thoughts to mine.	.07	.60	.26
12) I thought about if I would do things like CHARACTER or not.	.29	.50	.02
13) I sometimes felt the same emotions as CHARACTER.	-.07	.83	.13
14) I could feel the emotions CHARACTER showed.	.15	.66	.09
15) CHARACTER's feelings were contagious to my feelings.	.01	.63	.26
16) CHARACTER's feelings influenced my own mood.	.14	.39	.34
17) I felt compassion for CHARACTER.	.05	.86	-.10
18) I felt empathy for CHARACTER.	.07	.84	-.11
19) I reacted to CHARACTER's behavior with my facial expression.	.44	-.08	.52
20) CHARACTER's behavior triggered my facial expression.	.44	-.12	.51
21) At certain moments, I said something to CHARACTER.	.01	.07	.74
22) I commented out loud on CHARACTER's behavior.	.20	-.11	.69
23) I sometimes gestured towards CHARACTER.	-.11	.15	.82
24) CHARACTER's behavior led me to gesture at him/her.	-.07	.09	.81
SS loadings	4.78	4.07	3.41
Proportion variance	.23	.20	.16

Note: Exploratory factor analysis with all original 24 items aimed at capturing PSP. Fully standardized loadings, primary loadings in bold. Principal axis analysis with oblimin rotation. Solid horizontal lines represent theoretical distinctions between items aimed at cognitive, comparisons, affective, and conative PSP; dashed lines distinguish between the items theoretically aimed at subfacets. PSP = Parasocial Processing; SS loadings = Sum of Squared Loadings.

2.2 Results

Following the main goals of Study I, the analytical sequence and results presentation proceed in two main steps.

2.2.1 PSP's factorial structure

The first step of the EFA was to explore whether the item pool measured cognitive, affective, and conative PSP or whether another factor structure better fits PSP. We determined the number of factors to be extracted with an Eigenvalue > 1. Following this, three factors were extracted (Table 2). Inspecting the factor loadings yielded empirical support for the theoretical feasibility of the three-factor solution. Because most items predominantly loaded on those factors predicted by the theoretical framework, the three emerging factors represented cognitive, affective, and conative PSP. In line with our theoretical expectations, the items measuring users' self-comparisons with the character (Items 10–12) predominantly loaded on the affective factor, although less weakly than the items directly related to affective PSP (Items 13–18). This pattern corroborated our assumption that such comparisons are not indicative of cognitive PSP.

2.2.2 Suitable items to assess PSP

In the second step, we assessed the factor loadings in Table 2 by the theoretical definitions of cognitive, affective, and conative PSP to find the items most suited to efficiently measure PSP. We followed other research (Chang et al., 2011; Nießen et al., 2020) and aimed at three items per component (see 1.5). Since cognitive PSP comprises users' attention to the character (Items 1–3), comprehension of the character's actions and situations (Items 4–6), and thinking about their future (Items 7–9), the factor loadings support that cognitive PSP is most effectively measured by combining Items 3, 6, and 9. Affective PSP involves sharing the character's emotions (Items 13–14), which happens through emotional contagion (Items 15–16) and compassion for the character (Items 17–18). Thus, the factor loadings support that affective PSP is best captured through Items 13, 15, and 17. Conative PSP refers to mimicry, verbal reactions, and gestures. For mimicking (Items 19–20), verbal reactions (Items 21–22), and gestures (Items 23–24), the results indicate

that the items within the item pairs are largely interchangeable. Selecting items that most closely reflect the core idea that PSP is a reaction to the character's behavior is feasible; that is, Items 19, 22, and 24.

2.3 Discussion

Considering the overarching goal of a validated and practical short inventory for measuring PSP, Study I has two main findings. First, the item pool proved suitable for assessing PSP as a multifaceted concept. Three factors are coherently aligned with the theoretical distinction of cognitive, affective, and conative PSP. Second, there was variation in the suitability of the items, especially for cognitive PSP. Therefore, reducing the item pool aids in efficiency and validity. Study II proceeds with the nine-item short scale proposed by Study I.

3 Study II

Study II had two goals: (a) confirm Study I's results regarding the number of factors and their significance, and (b) extend the scope by examining (b.1) how reliably cognitive, affective, and conative PSP are measured, (b.2) how they are associated with each other as well as (b.3) how they are associated with other accounts of users' processing of media characters and content (i.e., PSR, R-PSI, PSI, identification, and transportation).

3.1 Materials and methods

The study design of Study II was preregistered (<https://osf.io/mg3dn>) and ethically approved by the Institutional Review Board of the University of Fribourg (No. 2022-11-01). Data and materials are openly available (<https://osf.io/kqbf2>).

3.1.1 Procedure and sample

Study II replicated the methodology of Study I. A sample of 500 US participants was iteratively recruited on *prolific* using census-representative gender, age, and ethnicity quotas (US Census Bureau, 2024) in January 2023. The sample size was held consistent with Study I to ensure comparability and aligns with widely accepted methodological recommendations for factor analytic research (see Study I Methods). Participants received a monetary incentive (\$2.36). The dataset was cleaned

using the criteria employed in Study I (completion time, attention checks, self-reported data quality). Two participants were excluded due to failed attention checks, and one due to completing the survey too quickly. Table S1 (SM) shows that the sample matched the US population and resembled the Study I sample. Participants had a mean age of 45.9 years ($SD=16.3$, $MIN=18$, $MAX=85$); 51% were female, 49% male. As in Study I, individuals identifying as mixed or other ethnicities and adults aged 75 and above were underrepresented, while white participants and those aged 25 to 64 were slightly overrepresented.

3.1.2 Measures

We used the same recall cues and 5-point Likert scale as in Study I. PSP was captured using the nine items derived in Study I (Item Descriptives in SM Table S4). The characters recalled in Study II were predominantly fictional (87%), male (63%), and from series (70%), with 13% non-fictional and 30% from films. PSR was measured using Tukachinsky's (2011) 13-item Parasocial Friendship Scale ($M=3.0$; $SD=1.3$; $\alpha=.97$). We used Rubin and Perse's (1987) 10-item version of Rubin et al.'s (1985) R-PSI ($M=3.2$; $SD=1.1$; $\alpha=.92$). PSI was assessed using Hartmann and Goldhoorn's (2011) six-item scale ($M=1.4$; $SD=.9$; $\alpha=.97$); identification using Cohen's (2001) 10-item identification scale ($M=3.3$; $SD=1.0$; $\alpha=.92$); transportation using eight items from Green and Brock's (2000) transportation scale ($M=3.5$; $SD=.7$; $\alpha=.74$). The full scales can be found in SM Table S2, their descriptives in Table S6.

3.1.3 Analysis

Considering its confirmatory purposes, Study II followed the EFA in Study I by using Confirmatory Factor Analysis (CFA). CFA bears the advantages of enabling more formal scale tests (Prochazka & Schweiger, 2019; Yale et al., 2015), catalyzing representative and generalizable results (Kohring & Matthes, 2007), and going beyond the traditional standard of Cronbach's (1951) alpha through more thorough reliability assessments (Bagozzi & Baumgartner, 1994; Bagozzi & Yi, 1988).

3.2 Results

The analysis proceeded in four steps in line with the CFA standard procedure. First, con-

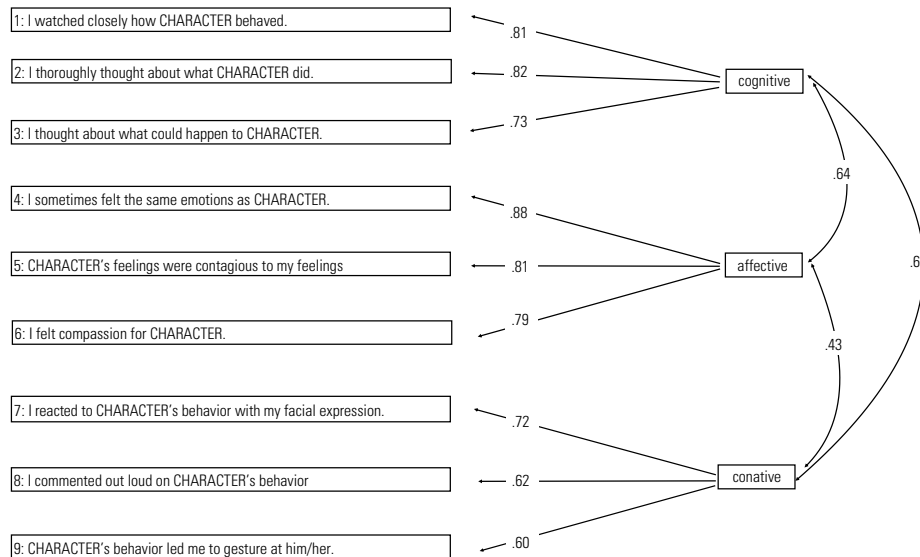
firm that the scale captures three cognitive, affective, and conative PSP factors. Second, determine how reliably these factors are measured. Third, the correlations among these factors are tested, and fourth, their associations with other closely related concepts are examined.

3.2.1 Factorial structure of PSP

To confirm that the scale captures the distinction between cognitive, affective, and conative PSP rather than one or two factors, we followed other researchers (e.g., Mangold, 2024; Prochazka & Schweiger, 2019) by assessing the fit of five CFA models (M): a one-factor model assuming that all items measured a single factor (M1), three two-factor models that collapsed cognitive and affective PSP items into one factor (M2.1), cognitive and conative PSP item into one factor (M2.2), and affective and conative PSP items into one factor (M2.3); and a three-factor model (M3) testing the assumption that the scale captures the theoretical distinction between cognitive, affective, and conative PSP. For completeness and transparency, we report the chi-square statistic along with degrees of freedom and associated p -values for all models (see Table S7 in the Supplementary Materials). However, given the well-documented sensitivity of the chi-square test to large sample sizes such as ours ($N=500$), we do not rely on it for substantive interpretation of model fit (Hu & Bentler, 1999; Marsh, Hau, & Wen, 2004).⁶ Instead, to evaluate absolute model fit, we focus on the following criteria: $RMSEA \leq .08$, $TLI \geq .95$, $CFI \geq .95$, and $SRMR \leq .08$. For relative fit, we report AIC, BIC, and the sample-size adjusted BIC (aBIC), where lower values indicate a bet-

⁶ Since the chi-square test is highly sensitive to large sample sizes, it tends to reject even well-fitting models by practically negligible deviations from perfect fit as statically significant. Moreover, because models with more parameters (and thus fewer degrees of freedom) almost always yield lower chi-square values, the statistic overly favours less parsimonious models with large samples. For these reasons, it is now increasingly common and considered best practice to rely primarily on approximate fit indices (e.g., RMSEA, CFI, SRMR), which provide more robust and interpretable assessments of model fit in large samples (Marsh, Hau, & Wen, 2004; Schermelleh-Engel, Moosbrugger, & Müller, 2003).

Figure 1: Confirmatory factor analysis of parasocial processing (Study II)



Note: The standardized values of the Confirmatory Factor Analysis of the short scale ($N=500$) are displayed. Fully standardized Maximum-Likelihood coefficients. Ellipses are latent factors, squares are manifest indicator variables. One-sided arrows are factor loadings, two-sided arrows are factor correlations. All factor loadings and correlations were statistically significant, $p < .05$. The three-factor model tests the assumption that our scale captures the theoretical distinction between cognitive, affective, and conative PSP. PSP = Parasocial Processing.

ter fit (e.g., Akaike, 1987; Hu & Bentler, 1999; Kline, 2005; Schermelleh-Engel, Moosbrugger, & Müller, 2003).

The results coherently supported the superiority of the three-factor model (M3): its AIC (= 13 271), BIC (= 13 359), and aBIC (13 293) were unexceptionally lower than those of the alternative models (AIC \geq 13 380; BIC \geq 13 460; aBIC \geq 13 400; full output in SM Table S7). Thus, the CFA confirmed that our scale measures three factors of cognitive, affective, and conative PSP. The three-factor model exhibited a good fit based on CFI (= .95) and SRMR (= .05), although its RMSEA (= .09) and TLI (= .93) remained slightly below desired thresholds, suggesting some residual reliability issues related to specific items.

3.2.2 PSP's reliability

We considered both the traditional standard of Cronbach's (1951) alpha ($\alpha \geq .70$) and the reliability criteria most common in CFA: Average Variance Extracted (AVE $\geq .50$), Composite Reliability (CR $\geq .60$), and Indicator Reliability ($\lambda_{\min} \geq .64$; e.g., Bagozzi & Baumgartner, 1994; Hair et al., 2010). The results supported

good reliability for cognitive ($\alpha = .83$; AVE = .62; CR = .83; $\lambda_{\min} = .73$) and affective PSP ($\alpha = .86$; AVE = .68; CR = .87; $\lambda_{\min} = .79$). For conative PSP, CR (= .67) exceeded the desired threshold, but Cronbach's alpha (= .69), AVE (= .41), and indicator reliability (= .62) did not yet perfectly meet the requirements. As revealed by the factor loadings reported in Figure 1, this occurred specifically due to Item 8 ("I commented out loud on CHARACTER's behavior") and Item 9 ("CHARACTER's behavior led me to gesture at him/her"). Since these items loaded with $\lambda_8 = .62$ and $\lambda_9 = .60$ on the conative factor, both were below the minimum requirement for indicator reliability.

3.2.3 PSP components' associations with each other

Since the associations between the PSP components thoroughly matched the theoretical assumptions (Figure 1), they reinforced the validity of our scale. The associations between cognitive, affective, and conative PSP were positive throughout (P1), supporting convergent validity. These associations were substantially lower than 1 (even $< .7$) throughout

Table 3: Associations of cognitive, affective, and conative PSP with other measures of users' processing of media character and content (Study II)

	PSR	R-PSI	Identification	Transportation	PSI
Cognitive PSP	.49	.55	.63	.67	.17
Affective PSP	.87	.87	.91	.52	.31
Conative PSP	.29	.32	.39	.43	.39

Note: Associations of the latent factors of cognitive, affective, and conative PSP with the correlates in the columns. All correlations were significantly positive, $p < .05$, and the differences between the associations outlined in the text were statistically significant, $p < .05$ (see also SM Figure S2 and Table S9). PSP = Parasocial Processing; PSR = Parasocial Relationships; R-PSI = Rubin-Parasocial Interaction; PSI = Parasocial Interaction.

(P2) – implying that our measures of cognitive, affective, and conative PSP exhibited more specific variance than they shared with each other, yielding evidence for discriminant validity.⁷ Supporting nomological validity, the association between affective and conative PSP was weaker than both PSP components' associations with cognitive PSP (P3).

3.2.4 PSP components' association with other relevant concepts

The associations of cognitive, affective, and conative PSP with other concepts of media character and content processing coherently matched our theoretical propositions (Table 3), further supporting the scale's validity. Both PSR (P4), R-PSI (P5), and identification (P6) were most strongly associated with affective PSP; transportation most strongly with cognitive PSP (P7); and PSI most strongly with conative PSP (P8). Likewise, the associations of PSR, R-PSI, and identification with affective PSP were thoroughly stronger than the association of transportation with cognitive PSP (P9), which was, in turn, stronger than the association between PSI and conative PSP (P10).

3.3 Discussion

Overall, Study II had two main findings. First, the results confirmed and coherently expand-

ed the evidence from Study I, yielding robust additional support for the PSP Short Inventory's ability to validly measure PSP as a multifaceted construct comprising a cognitive component, an affective component, and a conative component. Second, the results highlight the need to further improve the conative PSP items' reliability. To address this, we chose to refine the existing conative items from our preselected set rather than returning to the full 112-item pool. This decision was guided by theoretical coverage and conceptual fit, allowing us to enhance item clarity and psychometric performance while preserving comparability across studies.

4 Study III

The primary goal of Study III was: (a) to confirm previous results regarding the validity of the scale, and (b) to adapt the conative PSP measures to overcome the reliability issues identified in Study II. To do so, we discussed our measures with other scholars within the field and identified two reasons for the limited reliability of conative PSP.

First, the formulation of Item 8 (“I commented out loud on CHARACTER’s behavior”) did not unequivocally refer to users reacting to characters and included the adverb “out loud.” The adverb was likely too ambiguous. Some people might have interpreted “out loud” as shouting, while others might have interpreted it as speaking aloud in a normal register. Thus, the item formulation might have led users to exclude certain situations in which they engaged in conative PSP. Therefore, we changed

7 While the share of variance that factors share with each other is quantified by their squared correlation (Hair, Black, Babin, & Anderson, 2010; Kline, 5), the Fornell-Larcker (1981) criterion similarly supported discriminant validity (e.g., Boyd, Morrow, & Rocconi, 2022; Yang, Tang, & Zhang, 2022): AVEs for all factors was larger than their correlations' square.

the formulation to “CHARACTER’s behavior caused me to comment out loud or to myself.”

Second, since Item 9 specified “at him/her”⁸ (“CHARACTER’s behavior led me to gesture at him/her”), the formulation may have led to an imbalance in reported gestures. Participants might have reported gestures directed *toward* the character (e.g., wagging a finger at the character), but refrained from reporting gestures *not* directed toward the character (e.g., shrugging one’s shoulder). To include all types of gestures, Item 9 was revised to “CHARACTER’s behavior led me to gesture.”

4.1 Materials and methods

The study design of Study III was preregistered (<https://osf.io/mg3dn>) and ethically approved by the Institutional Review Board of the University of Fribourg (No. 2022-11-01). Data and materials are openly available (<https://osf.io/r5enz>).

4.1.1 Procedure and sample

An online survey was administered to a sample of 500 US participants recruited via the *prolific* platform using census-representative gender, age, and ethnicity quotas (US Census Bureau, 2024) in February 2023. The sample size was kept consistent with Studies I and II to ensure comparability and aligns with established guidelines for factor analytic research (see Study I Methods). Participants received a monetary incentive (\$2.63). The dataset was cleaned based on the same criteria as in Studies I and II. Four participants were excluded due to failed attention checks, and two due to filling in the survey too quickly. Table S1 shows that the sample generally matched the US population and resembled the samples employed in Studies I and II. The mean participant age was 45.1 years ($SD=15.6$, $MIN=18$, $MAX=86$), 52% were female, and 48% were male. Consistent with the previous studies, individuals identifying as mixed or other ethnicities and adults aged 75 and above were underrepresented, while white participants and those aged 25 to 64 were slightly overrepresented.

8 As highlighted by reviewers, an additional advantage of revising this item wording was the removal of the original phrasing “him/her,” thereby avoiding binary-gendered language and ensuring that the scale is applicable to media characters of all genders.

4.1.2 Measures

The same recall cues and 5-point Likert scales were employed as in Studies I and II. The characters recalled in Study III were predominantly fictional (88%), male (66%), and from series (71%), with 12% non-fictional and 29% from films. We captured PSP using the nine items applied in Study II with the two reformulations (Descriptives for Items, see Table S5). The same measurements used in Study II were used (see Table S2 for wording, Table S6 for descriptives): PSR ($M=3.0$, $SD=1.3$, $\alpha=.97$), R-PSI ($M=3.2$, $SD=1.2$, $\alpha=.94$), PSI ($M=1.5$, $SD=1.0$, $\alpha=.97$), identification ($M=3.3$, $SD=1.0$, $\alpha=.92$), and transportation ($M=3.5$, $SD=.7$, $\alpha=.73$).

4.1.3 Analysis

Study III directly replicated the CFA sequence employed in Study II, both for the purposes of reassuring and safeguarding the overall high feasibility of the PSP Short Inventory and for enabling a direct assessment of the effectiveness of the changes to the conative items made in response to the reliability results of Study II.

4.2 Results

Building on the analytical backgrounds outlined in Study II, the results of Study III can be summarized as follows.

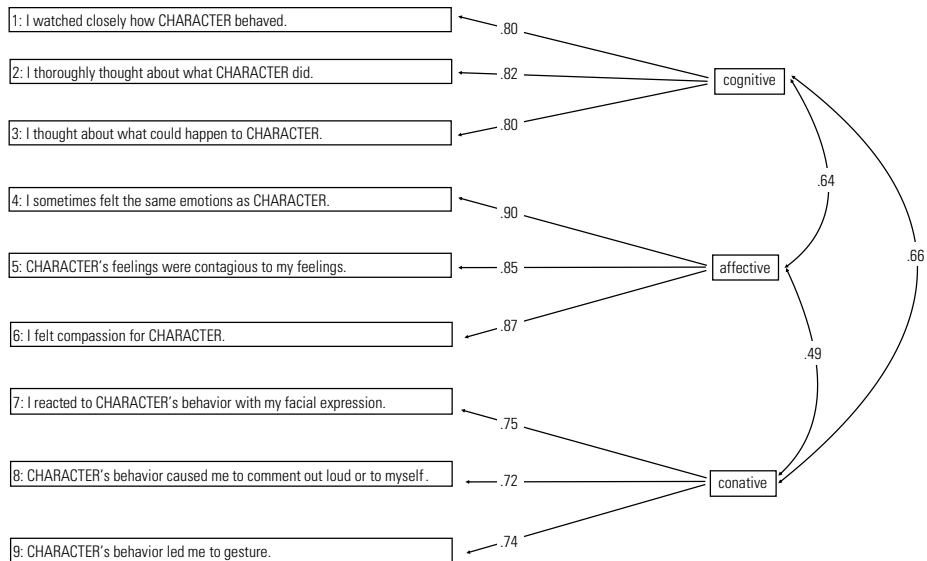
4.2.1 PSP’s factorial structure

Using the same statistics for absolute and relative model fit, the CFA replicated the superiority of the three-factor model, testing that our scale empirically captures the theoretical distinction between cognitive, affective, and conative PSP. Its AIC (= 12 863), BIC (= 12 951), and aBIC (12 885) were again thoroughly lower than those of the alternative one- and two-factor models ($AIC \geq 13\,039$; $BIC \geq 13\,119$; $aBIC \geq 13\,058$; full output in SM Table S8). Importantly, the three-factor model achieved good fit according to all absolute fit indices ($RMSEA=.07$; $CFI=.98$; $TLI=.97$; $SRMR=.04$), corroborating the scale’s overall suitability and the effectiveness of the scale adjustments made in response to the reliability issues of Study II.

4.2.2 PSP’s reliability

The reliability analysis confirmed the effectiveness of the changes to the conative items. All statistics unequivocally supported good

Figure 2: Confirmatory factor analysis of parasocial processing (Study III)



Note: The standardized values of the Confirmatory Factor Analysis of the short scale ($N = 500$) are displayed. Fully standardized Maximum-Likelihood coefficients. Ellipses are latent factors, squares are manifest indicator variables. One-sided arrows are factor loadings, two-sided arrows are factor correlations. All factor loadings and correlations were statistically significant, $p < .05$. The three-factor model tests the assumption that our scale captures the theoretical distinction between cognitive, affective, and conative PSP. PSP = Parasocial Processing.

reliability for cognitive ($\alpha = .85$; $AVE = .65$; $CR = .85$; $\lambda_{\min} = .80$), affective ($\alpha = .90$; $AVE = .76$; $CR = .91$; $\lambda_{\min} = .85$), and conative PSP ($\alpha = .78$; $AVE = .54$; $CR = .78$; $\lambda_{\min} = .72$).

4.2.3 PSP components' associations with each other

The associations between cognitive, affective, and conative PSP (Figure 2) replicated the match between theoretical expectations and empirical patterns already observed in Study II. Further confirming convergent, discriminant, and nomological validity, the associations of cognitive, affective, and conative PSP were positive throughout (P1); generally lower than .7 (P2); and the association between affective and conative PSP was weaker than their associations with cognitive PSP (P3).

4.2.4 PSP components' association with other relevant concepts

The results in Table 4 replicated the associations of cognitive, affective, and conative PSP with other concepts of media character and

content processing observed in Study II. Since these associations were again closely matched with our theoretical reference hypotheses, they further instilled confidence in the validity of our measures. PSR (P4) and R-PSI (P5) were most strongly correlated with affective PSP. The same applied to identification (P6). Transportation was most strongly correlated with cognitive PSP (P7), and PSI most strongly with conative PSP (P8). Transportation was less strongly associated with cognitive PSP, PSR, R-PSI, and identification with affective PSP (P9), and PSI was less strongly associated with conative PSP than transportation with cognitive PSP (P10).

4.3 Discussion

Overall, Study III completed our empirical analyses by coherently confirming the validity and reliability of the PSP Short Inventory. The improvements made to the conative factor following Study II significantly improved the scale's reliability. Thus, the PSP Short Inventory comprehensively assesses PSP. With nine items, it captures PSP efficiently and with em-

Table 4: Associations of cognitive, affective, and conative PSP with other measures of users' processing of media character and content (Study III)

	PSR	R-PSI	Identification	Transportation	PSI
Cognitive PSP	.49	.56	.68	.68	.18
Affective PSP	.89	.88	.88	.41	.26
Conative PSP	.44	.46	.51	.49	.41

Note: Associations of the latent factors of cognitive, affective, and conative PSP with the correlates in the columns. All correlations were significantly positive, $p < .05$, and the differences between the associations outlined in the text were statistically significant, $p < .05$ (see also SM Figure S2 and Table S10). PSP = Parasocial Processing; PSR = Parasocial Relationships; R-PSI = Rubin-Parasocial Interaction; PSI = Parasocial Interaction.

Table 5: Final version of the PSP short inventory (PSP-SI), measuring parasocial processing with 9 items categorized by PSP component

PSP Component	Item
Cognitive	I watched closely how CHARACTER behaved.
	I thoroughly thought about what CHARACTER did.
	I thought about what could happen to CHARACTER.
Affective	I sometimes felt the same emotions as CHARACTER.
	CHARACTER's feelings were contagious to my feelings.
	I felt compassion for CHARACTER.
Conative	I reacted to CHARACTER's behavior with my facial expression.
	CHARACTER's behavior caused me to comment out loud or to myself.
	CHARACTER's behavior led me to gesture.

Note: PSP = Parasocial Processing; PSP-SI = PSP Short Inventory.

empirical breadth appropriate to the theoretical conceptualization of PSP as a multifaceted concept. The final item selection was based on cumulative evidence across all three studies, combining theoretical fit with empirical criteria such as high and stable factor loadings, item clarity, and internal consistency. This process ensured that the final scale retained balanced representation of cognitive, affective, and conative components while maximizing parsimony and psychometric robustness. Table 5 provides a summary of the final 9-item PSP Short Inventory, distinguishing the items by PSP component to support clarity and facilitate future application.

5 Robustness tests

We conducted several robustness tests: (a) The results of Study I replicated when repeating the EFA with the data of Studies II and III – instilling confidence in factorial validity (see SM S5.1). (b) In line with nomological, convergent, and discriminant validity, both the associations between the PSP components and their associations with the other concepts were thoroughly robust against using (manifest) mean indices of affective, cognitive, and conative PSP instead of, as done in the main analyses, treating them as latent factors (see SM S5.2). (c) We established measurement invariance across Studies

II and III (see SM S5.3). (d) Second-order CFA models reinforced the conceptualization of PSP as a multifaceted concept with three related but distinct components (see SM S5.4).

6 General discussion

Amid a growing scholarly consensus on the theoretical importance of enriching research on parasocial experiences through closer examinations of PSP, media and communication scholars lacked a comprehensive instrument for capturing PSP in empirical studies. By addressing this demand through developing the PSP Short Inventory, the present research advances existing literature in at least five main regards.

Our first contribution is to provide a theoretically derived and thoroughly validated short scale for measuring PSP. Amid a general scholarly consensus on the critical importance of measures for theoretical advances (Dibble et al., 2023), only thorough scale validation can provide us with confidence that our measures capture what they are supposed to capture and – as a practical consequence – the meaningfulness and trustworthiness of the substantive conclusions drawn from empirical studies using these measures. Our finding of the PSP Short Inventory's high feasibility was consistent across multiple studies. It proved robust against alternative statistical choices and the standard of combining EFA with CFA (Boyd, Morrow, & Rocconi, 2022; Tukachinsky, 2011), as well as across a wide variety of psychometric angles, including assessments of factorial validity, reliability analysis, and various forms of convergent, discriminant, and nomological validity.

The second main contribution of our research is to enrich scholars' capability to research users' reactions to media characters. While research has made considerable progress in measuring other concepts like PSR (Tukachinsky, 2011) or PSI (Hartmann & Goldhoorn, 2011), PSP remained an exception. Our research facilitates theoretical innovation by enabling scholars to give new answers to research questions, ranging from how users react to characters by engaging in cognitive, affective, and/or conative processing to the more causal questions of what drives these

reactions and how they impact outcomes like enjoyment (e.g., Rosaen & Dibble, 2017), prolonged exposure (e.g., Erickson, Dal Cin, & Byl, 2019), or health communication (e.g., Hoffner & Cohen, 2023).

Our research's third main contribution is to confirm PSP's potential for playing an integrating role in overcoming the fragmentation of research on users' media character processing (Klimmt et al., 2006). The PSP Short Inventory coherently synthesized and linked the cognitive, affective, and conative main foci of other parasocial concepts. The result supported that our scale captures PSP validly and with the breadth appropriate to its theoretical definition as a complex and multifaceted concept (Klimmt et al., 2006). It meets the calls better to connect different subfields of parasocial research and facilitate comparisons (Dibble et al., 2023).

The fourth main contribution is to enrich the literature by addressing the fact that, despite a growing theoretical consensus that core concepts like PSP, PSI, or PSR are not conceptually interchangeable, prevailing empirical operationalizations like Rubin et al.'s (1985) PSI Scale have blurred their differences by conflating their measurement (Dibble et al., 2016). Indeed, PSI is theoretically centered on users' illusion of being in an interaction with a character during an instance of media exposure rather than their reactions to media characters more broadly (Hartmann & Goldhoorn, 2011; Horton & Wohl, 1956), concepts like PSR and identification on enduring feelings of friendship and affect (Cohen, 2001; Tukachinsky, 2011) and concepts like transportation on users' engagement with media content (Green & Brock, 2000). Against this background, the PSP Short Inventory aids in overcoming conceptual ambiguities. It accounts for and differentiates between cognitive, affective, and conative processes, puts these processes on the same scale, and makes scholars less contingent on proxy measures that have only indirectly allowed them to infer users' reactions to media characters.

As a fifth set of improvements, the PSP Short Inventory opens practical advantages due to its parsimony. The scale can be administered easily and efficiently in empirical studies. Measuring PSP with nine items fosters cost-effectiveness and enhances data

quality by reducing respondent burden and fatigue (e.g., Rammstedt & Beierlein, 2014; Ziegler et al., 2014). The PSP Short Inventory can be adapted for various research contexts, designs, and objectives while preserving its ability to assess PSP and safeguard comparability (e.g., Appel, Gnambs, Richter, & Green, 2015). The PSP Short Inventory can be comprehensively combined with measures of other concepts for investigating their interplay and interactions, for example, in shaping media effects, as well as feasibly integrated for enabling comparisons of users' processing across various media characters in today's high-choice media environments.

Overall, the advantages enabled by the PSP Short Inventory facilitate more viable empirical results in parasocial research. At the same time, we urge readers to bear in mind the limitations of our research. We instructed participants to select a character and an exposure situation based on a recall cue. While this procedure was necessary to avoid skewing toward participants' favorite characters, future research should administer the scale directly after media exposure, for example, in studies using experience sampling or combining in-situ surveys with digital traces (Mangold, Wieland, Stier, & Otto, 2023; Otto, Thomas, Maier, & Ottenstein, 2020; Wirz et al., 2023).

Considering the limitations imposed by cross-sectional data, future studies should use longitudinal panel data to shed light on the causal interplay between the PSP components and other concepts of parasocial experiences and enable tests of their measures' predictive validity. Yet, such tests will require additional theoretical reflection about causal identification, optimal time lags, reciprocal and mutually reinforcing relations (Hayes, 2017; Slater, 2007), as well as which outcome variables are most relevant from the viewpoints of the various subfields with an interest in parasocial experiences.

Another relevant direction for future research is the application of the PSP Short Inventory across different media types (e.g., social media posts), character categories (e.g., influencers), and more diverse samples. While our conceptual framework defines media characters broadly to include fictional and non-fictional figures across diverse formats, the empirical scope of our studies was more specific.

Participants were instructed to recall characters from series or films. In our study, the English version of the scale was tested exclusively with US participants, so the generalizability of our findings to other cultural contexts remains to be established. Future research should validate translations of the scale in other languages and assess its applicability in different cultural settings. For scholars intending to use the original scale by Schramm and Hartmann (2008), a direct validation comparable to the one undertaken for the PSP Short Inventory herein remains pending. In addition, while the PSP Short Inventory was empirically evaluated across three studies, the initial item reduction from the original 112-item scale to the 24-item pool was guided solely by theoretical reasoning. We acknowledge the lack of a preliminary empirical screening (i.e., a potential 'Study 0') as a limitation. Future research could combine theory-driven preselection with early data-driven refinement techniques to further enhance conceptual and psychometric coverage.

Acknowledgements

All procedures were conducted in accordance with the ethical standards of the institution's *Human Research Ethics Committee* (approval no. 2022-11-01). The study was pre-registered, and all data and materials are openly available on the Open Science Framework at <https://osf.io/8tavn>. Participants' incentives were funded by the *Centenary Research Fund* of the University of Fribourg. Supplementary Online Material accompanies this article. Authorship contributions are as follows: Michelle Möri—conceptualization, methodology, investigation, data curation, formal analysis, writing (original draft), writing (review & editing), project administration, and funding acquisition; Frank Mangold—conceptualization, methodology, investigation, writing (original draft), writing (review & editing), and supervision; Andreas Fahr—conceptualization, writing (review & editing), supervision, and funding acquisition.

Conflict of interest

The authors declare no conflict of interest.

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