

Parents' Perceptions of Their Children's Parasocial Relationships: The Recontact Study

Imagination, Cognition and
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Abstract

Parent report measures indicate that young children's parasocial relationships (PSRs) are multidimensional constructs consisting of dimensions such as social realism, attachment and character personification, and human-like needs. However, little is known about how parent perceptions of these dimensions evolve as children mature and form new PSRs. In this 3-year follow-up study, parents ($N = 156$) from two previous studies were recontacted, and they provided updated information about their children's PSRs in an online questionnaire. A principal components analysis revealed that the dimensions of social realism, attachment and character personification, and human-like needs reemerged when children were approximately 6- to 8-years-old and had formed new or retained previous relationships with favorite media characters. A new dimension of character qualities also emerged, paralleling the developmental changes that occur in children's real friendships. These results clarify parent reports of the dimensions that comprise children's PSRs and provide

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descriptive information about the ways in which parent perceptions of children's PSRs shift as their children mature.

Keywords

parasocial relationships, media characters, parent report measures, longitudinal follow-up study, online measure

Young children's lives are embedded in social relationships, be they with real people, imaginary friends, or media characters (Calvert, 2017). During these early years, the line between fantasy and reality is blurry, with beliefs of animism emerging during early childhood when nonhuman entities are treated as if they were alive (Piaget, Tomilson, & Tomilson, 2007). This facet of childhood thinking provides a window of opportunity for using media characters as early social partners (Richert, Robb, & Smith, 2011), who could guide social interactions that result in learning that others have feelings and needs, as well as how to treat others in empathic ways. Such skills are foundational for early and later friendship development, social competence, and cognitive development (Calvert, 2017; Hartup, 1989).

Children's parasocial relationships (PSRs) are defined as one-way emotionally tinged relationships that an audience member forms with a media figure (Hoffner, 2008). Given the pervasive exposure of young children to media characters (Common Sense Media, 2017), it is surprising that so little is known about how young children's PSRs influence their development. Indeed, we are just beginning to understand what early PSRs even entail. In recent studies, parent report measures indicate that 3- to 4-year-old children's PSRs are multidimensional constructs consisting of three dimensions (Bond & Calvert, 2014a; Richards & Calvert, 2016). However, the specific dimensions that comprise young children's PSRs differ somewhat across studies (e.g., Bond & Calvert, 2014a; Hoffner, 1996; Richards & Calvert, 2016; Rosaen & Dibble, 2008). In addition, as children develop, their social needs change (Bigelow, 1977; Furman & Bierman, 1984), which could be reflected in their PSRs with media characters.

In the current study, we clarify the dimensions that comprise parent perceptions of children's PSRs and examine the extent to which parent perceptions of young children's PSRs shift when children are older and form new attachments to different media characters. Specifically, we examine the dimensions that comprise preschool and school age children's PSRs with their favorite media character using an adapted parent report measure (Bond & Calvert, 2014a). Parents in this study were recontacted approximately three years after their original survey data from two independent studies had been collected (Bond & Calvert, 2014a; Richards & Calvert, 2016). In what follows, we review the literature on PSRs with media characters, focusing on how PSRs are defined in

both research on adults and children, as well as the dimensions that comprise children's PSRs with media characters.

Origins of Research on PSRs With Media Characters

Horton and Wohl (1956) first defined relationships with media personalities as *parasocial interaction* (PSI), the development of a one-sided socioemotional bond with an on-screen character or an over-the-airwaves personality that was perceived as a face-to-face experience. Much of the early work on PSI focused on adults' interactions and relational experiences with television personalities (e.g., news anchors; Rubin & Perse, 1987a), or to actors' role-playing characters in on-screen dramas (e.g., a character in a soap opera; Rubin & Perse, 1987b). Research with adults has shown that emotional connections with media characters develop in ways that parallel face-to-face friendships, such as through initial attraction and identification with the on-screen character (e.g., Auter & Palmgreen, 2000; Rubin, Perse, & Powell, 1985).

Since the foundational work by Horton and Wohl (1956), scholars have sought to distinguish PSR from PSI, largely based on the duration of the experience (i.e., moment to moment experiences vs. an enduring bond; Dibble & Rosaen, 2011; Giles, 2002; Klimmit, Hartmann, & Schramm, 2006; Schramm & Hartmann, 2008). According to Schramm and Hartmann (2008), PSI occur within a single media experience and are understood as individual instances of viewers' responses to media characters; by contrast, PSRs remain beyond any one instance of media exposure as a lasting, affective bond between the viewer and the on-screen individual. In the child research area, PSR has become defined as the affective bond that a child feels for a character (Hoffner, 2008), while PSI has become defined as the perception of a social interaction between a child and a media character (Lauricella, Gola, & Calvert, 2011). Research with adults and children has shown that multiple instances of PSI strengthen PSR (Bond & Calvert, 2014a; Rubin & McHugh, 1987), just as continued conversations can make people feel closer to one another in face-to-face friendships (Berger & Calabrese, 1975).¹

Measuring Children's PSRs With Media Characters

In children, much of the research on PSRs has been conducted with adolescents, examining their experiences with popular on-screen personas, such as celebrities, actors, and musicians (e.g., Boon & Lomore, 2001; Erickson & Dal Cin, 2018; Giles & Maltby, 2004; Gleason, Theran, & Newberg, 2017). In these studies, the focus has often been on an amalgam of PSI and PSR or on other constructs that are often associated but considered separate from PSR, such as school-age children and adolescents' *wishful identification* with media characters (i.e., the desire to emulate a beloved media character; Hoffner, 1996). As has been found in research with adults (Dibble, Hartmann, & Rosaen, 2016), operationalizing PSI

and PSR in children is varied across studies. Research on younger children's PSRs with media characters is more limited and has focused on either specific experiences with media characters (e.g., the extent to which the character conveys a sense of social realism; Rosaen & Dibble, 2008) or the components that comprise children's PSRs with media characters (Bond & Calvert, 2014a; Richards & Calvert, 2016, 2017; Rosaen, Sherry, & Smith, 2011).

To date, the extant research on younger children's relationships with media characters has typically focused on children's experiences with their *favorite* media characters (e.g., Hoffner, 1996; Richards & Calvert, 2016; Rosaen & Dibble, 2008). This approach is based on the assumption that children are most likely to form close emotional bonds with media characters that they consider to be their favorites. Assessments of children's relationships with their favorite media characters—be it PSRs, PSIs, or wishful identification—have used both child and parent report measures (e.g., Bond & Calvert, 2014a; Hoffner, 1996; Richards & Calvert, 2017; Rosaen & Dibble, 2008; Rosaen et al., 2011). In child report measures, children are frequently asked to name their favorite character and then asked a series of questions about their experiences with their favorite media character, sometimes using child friendly Likert scales (e.g., Hoffner, 1996; Richards & Calvert, 2017; Rosaen & Dibble, 2008).

In older children, responses to measures of other related constructs of PSR—such as PSI and wishful identification—demonstrate internal consistency. For instance, Hoffner (1996) focused on 7- to 12-year-olds' experiences with their favorite television characters and included child report measures of PSI ($\alpha = .70$), wishful identification ($\alpha = .80$), and character traits; character traits yielded five factors, which consisted of social behavior (kind, helpful, caring, mean; $\alpha = .90$), attractiveness (handsome or pretty, good-looking, somewhat ugly; $\alpha = .89$), humor (funny, says, and does funny things; $\alpha = .81$), strength (physically strong, has more strength than most people; $\alpha = .79$), and intelligence (smart, good at figuring things out, dumb; $\alpha = .87$). Similarly, a study by Rosaen et al. (2011) that included a broad range of children (5- to 16-year-olds) produced internally consistent responses from children on a positive PSR measure adapted from both Rubin and Perse (1987a) and Rosaen and Dibble (2008). In this study, 5- to 16-year-old maltreated and typically developing children selected favorite characters and then reported on their experiences of PSR with those characters (e.g., character makes the child feel comfortable, character is easy to talk to, child thinks of character as a friend, $\alpha = .80$). An exploratory and confirmatory factor analysis revealed a unidimensional factor of PSR. Adult coders—rather than the children themselves—rated children's favorite media characters on the character qualities identified by Hoffner (1996; e.g., successful, admired; $\alpha s = .73-.84$).

For very young children, parents are often asked to answer questions to assess PSRs, in part because of problems with internal consistency in young children's responses (Richards & Calvert, 2016, 2017). For example, Richards and Calvert (2017) found that children aged 2 to 6 years could identify a favorite

media character and report on their experience with them. However, the internal consistency of the subscales for these children's reports were generally not acceptable, except for responses to items assessing attachment and friendship with a favorite character in 4- to 6-year-old children ($\alpha = .70$). Thus, parent surveys are an alternative approach for measuring young children's PSRs. They have the advantage of yielding internally consistent subscales while also yielding dimensions that parallel their children's report about their favorite media character (Bond & Calvert, 2014a; Richards & Calvert, 2016).

The parent PSRs measure is one such approach (Bond & Calvert, 2014a). One limitation of this parent report measure is that parents and children do not always agree on which media character is the child's current favorite (see Richards & Calvert, 2016). A possible explanation is that children might be attracted to several different media characters, not just one. Even so, similarities in the dimensions that comprise parent and child report measures of young children's PSRs indicate that parents can accurately report on children's relationships with media characters (Richards & Calvert, 2016), and that parent measure is the focus of our study here.

Dimensions of Young Children's PSRs

The parent PSRs measure, a survey originally developed with a sample of U.S. parents, consists of questions primarily designed to assess dimensions of their children's PSRs with their favorite characters (Bond & Calvert, 2014a). The questions in this survey included items from other scholars' research (Giles, 2002; Hoffner, 1996, 2008; Rubin & Perse, 1987a). In the first parent survey study in this area, Bond and Calvert (2014a) found that a subset of 17 items about 6-month to 8-year-old children's PSRs was reduced to 12 items that loaded onto three separate dimensions: social realism (character is perceived as imaginary, as real, believes that character is really doing events shown onscreen), attachment (character makes child feel safe, comfortable, soothed), and character personification (trust, friendship, character has thoughts and emotions, character has needs, character has wants, child feels sad when character makes mistakes). Richards and Calvert (2016) then used the reduced set of 12 items to compare parent and child report measures of PSRs. Once again, results of the parent report measure yielded three dimensions, which were similar but somewhat different from the dimensions found by Bond and Calvert (2014a). These parent dimensions for Richards and Calvert (2016) were social realism (character is perceived as imaginary, as real, believes that character is really doing events shown onscreen), a combination of attachment and character personification (trust, safety, soothing, comforting, has thoughts and emotions), and human-like needs (character has needs and wants). These dimensions were consistent with those found by directly asking the children of these parents' questions about their favorite characters (Richards & Calvert, 2016, 2017).

Social realism. *Social realism* is defined as the extent to which children view their favorite media character as being able to exist in the real world versus being pretend and imaginary (Bond & Calvert, 2014a; Richards & Calvert, 2016). In research with children, Rosaen and Dibble (2008) focus on the extent to which a character's appearance and behaviors are grounded in the real world, which is consistent with how social realism has been measured in studies of young children's PSRs (e.g., Bond & Calvert, 2014a; Richards & Calvert, 2016, 2017).

With Rosaen and Dibble's definition in mind (2008), many of young children's media characters are typically fantastical, animated people or creatures that are embedded in narratives where impossible events can occur (e.g., conversing with animals; Calvert & Richards, 2014; Mares & Sivakumar, 2014; Richert et al., 2011). Because young children can discern fantasy from reality in many instances (Walker, Ganea, & Gopnik, 2012; Weisberg & Sobel, 2012; Woolley & Ghossainy, 2013), it seems logical that even very young children would view media characters more as pretend entities.

Young children, however, might view their *favorite* media characters as more real because of the ways in which these characters are programed in television and film. Children's media characters are designed to convey a strong sense of realism through the way they move and the way they interact (Calvert & Richards, 2014). For instance, nonhuman media characters speak, walk on two feet, and convey emotion through human-like facial expressions (Calvert & Richards, 2014). Much like television news programing with news anchors (e.g., Dibble et al., 2016; Rubin & Perse, 1987a), children's media characters also can simulate socially contingent responses in ways that mimic real social interactions. In children's educational television programs, characters often direct their gaze into the camera, pose questions, and appear to wait for responses from children (i.e., a PSI that creates a simulated conversation between a child and a media character; Lauricella et al., 2011).

This simulated social contingency can convey a powerful sense of social realism for young children. However, how might perceptions of social realism evolve as children mature? Some studies of children's fantasy or reality distinctions indicate that older children have a more nuanced understanding of this distinction than younger children (see Woolley & Ghossainy, 2013 for a review). Nevertheless, there are some circumstances in which older children appear more likely to endorse fantastical beings as real than younger children (e.g., Woolley, Boerger, & Markman, 2004). According to Woolley and Ghossainy (2013), both experience and maturation play a role in children's understanding of media characters' social realism.

Children gain increased experience with media as they age (Common Sense Media, 2017), and children's understanding of fantasy and reality develops over time (see Woolley, 1997; Woolley & Ghossainy, 2013). In a study by Richards and Calvert (2016), parents of younger children indicated that their children were more likely to perceive their favorite media characters as real than parents

of older children. Thus, as children age and gain more experience with media characters over time, social realism could become a less prominent dimension of children's PSRs, as reflected in parent perceptions of children's PSRs with their favorite media characters.

Attachment and character personification. In both child and adult PSRs, *attachment* refers to the comfort and security that is derived from relationships with media characters. In children's real-life friendships, feelings of attachment (including trust, nurturance, and emotional security) are considered some of the hallmarks of high-quality friendships (Furman, 1996) that are associated with positive developmental outcomes (Hartup, 1996; Rubin, Bowker, McDonald, & Menzer, 2013). According to Cole and Leets (1999), emotional attachments with media characters also mirror real-life relationships, providing a sense of trust, comfort, and security. In this study, Cole and Leets (1999) focused on adult attachment style and PSI with media characters which were measured on a unidimensional scale adapted from Auter (1992) and Rubin et al. (1985). Adults' attachment styles were associated with the intensity of PSI, wherein adults with anxious-ambivalent attachment styles were more likely to experience PSI with media characters. Cole and Leets (1999) interpreted this finding through uses and gratification theory (e.g., Nordland, 1978), arguing that the adults with insecure attachment styles seek and derive emotional security through the development of PSI with media characters.

In children, both parent and child report measures of PSRs indicate that young children experience their favorite media characters as providing trust, safety, and comfort (Bond & Calvert, 2014a; Richards & Calvert, 2016, 2017; Rosaen et al., 2011). For example, Rosaen et al. (2011) found that both maltreated and typically developing children reported experiencing comfort, as well as other aspects of real-world friendships, in similar ways. This result was independent of the frequency of exposure to favorite media characters, which differed between the two groups of children (i.e., maltreated children had significantly more exposure to their favorite media characters, based on time spent watching television; Rosaen et al., 2011).

To form relationships with media characters that can afford emotional security, both Bond and Calvert (2014a) and Giles (2002) have argued that the character should be thought of as *person-like* (i.e., the character should be personified). These arguments are based on the uncertainty reduction theory, in which perceptions of a media character as person-like can reduce feelings of uncertainty and increase a sense of attraction and affinity (e.g., Giles, 2002; Perse & Rubin, 1989). Some of children's preferred media characters may be personified simply because the characters are depicted as people (e.g., Dora the ExplorerTM). However, many other popular characters are animals or artifacts that are anthropomorphized. Anthropomorphism is defined as the attributions of human mental states to nonhuman entities (Waytz, Klein, &

Epley, 2013). Children's nonhuman media characters often express feelings and have social or emotional experiences like real children, such as resolving conflicts with friends (Calvert & Richards, 2014). The television program, *Daniel Tiger's Neighborhood*®, for example, anthropomorphizes the lead character, Daniel, as a tiger cub who expresses emotions, learns to regulate affective states, and explores ways to resolve disagreements with friends through talking, turn-taking, and sharing.

In parent report research by Bond and Calvert (2014a) and Richard and Calvert (2016), *character personification* is measured as the extent to which parents perceived their children as attributing mental states, needs, and desires to their favorite media characters. In Bond and Calvert's (2014a) original parent report measure, items assessing these attributions loaded onto a single *character personification* component, indicating that parents view character personification as an important aspect of children's PSRs. However, in Richards and Calvert's (2016) study of parent reports, items assessing both attachment and character personification loaded onto a single component, with two items assessing attributions of *wants* and *needs* loading onto a separate dimension, which was labeled as human-like needs.

Given these differences, further research on parent perceptions of children's PSRs could clarify the extent to which attachment and character personification are either separate dimensions or a unitary dimension of children's PSRs. In addition, little is currently known about how parent perceptions of attachment and character personification evolve as children mature. Over time, children's real friendships are increasingly based on intimate qualities, such as companionship, emotional support, and trust (Bigelow, 1977; Furman, 1996; Furman & Bierman, 1984). Because young children can derive similar affordances from relationships with their favorite media characters (Bond & Calvert, 2014a; Hoffner, 1996; Richards & Calvert, 2016, 2017; Rosaen et al., 2011), parents could continue viewing their children's PSRs as sources of emotional attachment when children are older.

Human-like needs. In recent parent and child reports, human-like needs emerged from character personification into a separate factor of young children's PSRs (Richards & Calvert, 2016, 2017). Based on the items in this factor, Richards and Calvert (2016, 2017) describe human-like needs as the attribution of specific human-like functions, such as having psychological needs and desires (in parent reports), and having biological functions, such as needing to eat and sleep (child reports). In behavioral observations of young children's PSRs, the attribution of human-like needs is found in the nurturing behaviors children engage in with plush toy versions of a favorite media character, including feeding and putting the toy version of a favorite media character to bed (Calvert, Richards, & Kent, 2014; Gola, Richards, Lauricella, & Calvert, 2013). For young children, engaging in nurturing behaviors with plush toy media

characters, a behavioral indicator of early PSRs, is associated with better subsequent learning of math concepts when these media characters present academic lessons onscreen (Calvert et al., 2014; Gola et al., 2013). The latter finding suggests an important link between social closeness with media characters and positive cognitive outcomes.

The emergence of human-like needs in recent parent report measures (Richards & Calvert, 2016) raises important questions about the distinctions between character personification and human-like needs in parent perceptions of children's PSRs with their favorite media characters. Replication with a follow-up parent report measure is an important first step in determining if human-like needs are indeed distinct from character personification in parent perceptions of children's PSRs. As children's real friendships evolve over time, it would also be worthwhile to examine the extent to which parents continue to perceive human-like needs as a dimension among older children's PSRs. The importance of this dimension could diminish in older children's PSRs, where care-taking behaviors could be less prominent in toy play with plush versions of media characters. Moreover, parent reports indicate that when children stop liking their favorite media characters, they are often drawn to new media characters that are typically more conforming to gender stereotypes (e.g., boys prefer male characters who are more dominant; Bond & Calvert, 2014b). Differences in gendered qualities of media characters have further implications for the potential gender difference that could emerge in parent perceptions of human-like needs among older children's PSRs. For example, human-like needs might be a less salient feature, particularly among boys' as compared with girls' PSRs as they age (Bond & Calvert, 2014b).

Character qualities. *Character qualities* refer to attributes that might attract children to their favorite media characters. In children's real friendships, "the idealization hypothesis" posits that children are often attracted to peers with desirable qualities, such as being physically attractive, athletic, and socially competent (Aboud & Mendelson, 1996). Studies examining school-aged children's sociometric status support the idealization hypothesis, finding that physically attractive, socially skilled, and athletically competent children have high sociometric statuses and more real-life friendships (Aboud & Mendelson, 1996; Rubin et al., 2013).

Mirroring children's real friendships, a similar theory—*wishful identification*—involves PSIs with media characters, in which children are drawn to media characters with desirable qualities (such as being smart or attractive) because they aspire to look and behave in similar ways to these characters (Feilitzen & Linne, 1975; Giles, 2002; Hoffner, 1996). In a study of 7- to 12-year-old children, Hoffner (1996) found that attractiveness, humor, intelligence, and strength predicted wishful identification with media characters, although these qualities varied based on the participant's gender as well as the gender of the media

character. Girls' wishful identification with female characters was predicted by attractiveness, whereas boys' wishful identification with male media characters was predicted by intelligence.

Wishful identification with media characters is currently considered a construct that is separate from PSRs (Giles, 2002). However, hints of the desirable qualities that attract children to media characters have emerged in both parent and child report measures of children's PSRs (Bond & Calvert, 2014a; Richards & Calvert, 2016). In their initial parent report measure of young children's PSRs, Bond and Calvert (2014a) adapted items designed to assess physical and social qualities of a media character that children might value and admire. These items were based on the qualities developed in Hoffner's (1996) study (e.g., intelligence, humor, strength, physical attractiveness). The item measuring physical attractiveness loaded onto a separate factor, but this dimension was dropped from the final model. Similarly, Richards and Calvert (2016) found that attractiveness loaded onto a separate factor for parent reports of their children's PSRs; however, parents were not asked all items that were in the original survey. In child report measures, character *cuteness* loaded onto a factor of attachment and friendship, suggesting that physical attractiveness might be an integral part of children's experiences with their favorite media characters, particularly for girls (Richards & Calvert, 2017).

The consistent emergence of physical attractiveness across these studies suggests that a broader dimension of character qualities could become a feature of children's PSRs, particularly when children are older, as they were in Hoffner's (1996) study. Given the gender differences that have been found in children's wishful identification with media characters (Hoffner, 1996), it is also possible that similar differences will be reflected in parent reports of children's PSRs (e.g., physical attractiveness for girls).

Study Aims

The aims of this descriptive study were twofold: (a) to clarify the dimensions of children's PSRs that emerge with a parent report survey and (b) to describe the extent to which parent reports of the dimensions that comprise children's PSRs shift when children have dissolved old PSRs and formed new ones. Our hypotheses were as follows:

Hypothesis 1: Based on the factor analyses of data from parents and their children (Richards & Calvert, 2016, 2017), we hypothesized that parent reports of their children's PSRs with media characters would yield dimensions of attachment and character personification, social realism, and human-like needs.

Hypothesis 2: With parents of older preschool and school age children, we hypothesized that character qualities would emerge as a fourth dimension of

children’s PSRs, capturing characteristics like attractiveness and intelligence that emerged in Hoffner’s (1996) study.

Hypothesis 3: Based on Hoffner’s (1996) findings, we expected that parents would report that girls more so than boys would view favorite media characters as having wants and needs, and as being physically attractive.

Method

Participants

Our participant pool consisted of 282 U.S. parents living in the Washington, DC, metropolitan area who had participated in two earlier studies of children’s PSRs (Bond & Calvert, 2014a; Richards & Calvert, 2016). Of the 282 parents recontacted, 156 agreed to participate (54.60% retention rate; 65% from Bond & Calvert, 2014a; 35% from Richards & Calvert, 2016; mean child age² = 6.59 years, SD = 1.33, age range = 3.25 years – 9.16 years; 79 boys and 77 girls; see Table 1). Parents identified 68.6% of the children as Caucasian, 18.6% as mixed or other ethnicities, 5.1% as Asian, 4.5% as African American, and 1.9% as Hispanic or Latino, with 1.3% not reporting their child’s ethnicity.

Parents provided updated information on their children’s PSRs approximately 3.03 years (SD = .50) after their initial participation in the earlier studies.

Table 1. Current Age and Gender of Children by Initial Study (N = 155^a).

	3- to 4-year-olds	5- to 6-year-olds	7- to 8-year-olds	9-year-olds
Bond and Calvert (2014a)				
Boys (n = 60)	9	32	19	2
Girls (n = 55)	4	26	25	0
Total (n = 115 ^a)	13	58	44	2
Richards and Calvert (2016)				
Boys (n = 19)	5	4	8	0
Girls (n = 21)	1	9	11	0
Total (n = 40)	6	13	19	0
Total by age-group	19 (12.3%)	71 (45.8%)	63 (40.6%)	2 (1.3%)

^aOne parent did not report the child’s date of birth.

Parent PSR Measure

Parents answered the online parent PSRs measure developed by Bond and Calvert (2014a), consisting of 17 items designed to assess parents' perceptions of their children's PSRs with their favorite characters. These included the following: (a) *social realism*, assessing the extent to which children perceive their favorite media characters as real or pretend, as actually doing the actions that are presented onscreen (Bond & Calvert, 2014a; Richards & Calvert, 2016). These items were developed based on an adaptation of Hoffner's (1996) scale, which was derived in part from Rubin and Perse (1987a); (b) *attachment and character personification*, assessing the extent to which children view their favorite media characters as trustworthy, *person-like* friends who make them feel safe, who can soothe them, who can provide them with comfort and emotional security, and with whom they feel empathy for (two dimensions for Bond & Calvert, 2014a; one dimension for Richards & Calvert, 2016). These items were adapted from Rubin and Perse's (1987a) PSI measure, Hoffner's (1996) PSI scale, and the conceptual work about PSI from Giles (2002); and (c) *human-like needs*, assessing the extent to which children perceive their favorite media character as having wants and needs (Richards & Calvert, 2016). These items were developed based on behavioral measures of young children's PSRs, in which toddlers interacted with plush versions of media characters in nurturing ways, such as feeding the toy and putting the toy to bed (Calvert et al., 2014; Gola et al., 2013).

Based on previous findings about attractiveness, questions were included to assess a possible fourth dimension of *character qualities*, which assessed perceptions of favorite media characters as attractive, funny, intelligent, smart, and strong. These items were developed based on Hoffner's (1996) character traits measure.

Procedure

U.S. parents who had participated in two separate studies of young children's PSRs (Bond & Calvert, 2014a; Richards & Calvert, 2016) were recontacted via e-mail with an invitation to participate in this follow-up study. For parents who participated online, the e-mail invitation provided a link to an online questionnaire, which was administered via Qualtrics software (Qualtrics Research Suite©, 2017). Twenty parents were also recontacted via telephone to remind them of the e-mail invitation, and one parent provided information over the phone. Assessment procedures were consistent with the two prior PSR survey administrations (Bond & Calvert, 2014a; Richards & Calvert, 2016).

The online survey began with an informed consent form, which parents signed electronically to participate. Parents were first given the name of the child that they had previously reported on (in the event that they had multiple children) and whether or not their child had a favorite media character when they were first surveyed (e.g., "When you completed our original study, you

indicated that [child]...”). Parents were then asked if their child had a current *favorite* media character. If parents responded positively, they answered questions about their child’s experiences with the media character. All questions were presented in unique, randomized orders.

Throughout the survey, the child’s name and the favorite media character were automatically embedded into each item. For example, if a parent reported on a child named Jenny whose favorite media character was Daniel Tiger, then the item, “[Child] trusts [character]” would have read as, “Jenny trusts Daniel Tiger.” Response options were on a 5-point Likert scale, in this case with choices ranging from *strongly disagree* to *strongly agree*.³ For the parent who provided information over the telephone, the procedure of the survey administration was identical.

All participants were entered into a drawing to win a \$150 Amazon gift card as compensation for participation. Gift cards were awarded to six randomly selected participants.

This procedure was approved by and conducted in compliance with the University’s institutional review board.

Results

Past and Current Favorite Media Characters

According to parents, the majority of children (89%) had changed their favorite media characters from the time of the original studies (Bond & Calvert, 2014a; Richards & Calvert, 2016). Of these children, 76.9% had a favorite media character that differed from the initial studies and 12.1% of children who did not have a favorite character initially (Bond & Calvert, 2014a; Richards & Calvert, 2016) had a current favorite media character, as per parent report. However, 11% of parents indicated that their children had maintained their original media character as a favorite.

Consistent with prior results (Bond & Calvert, 2014b; Richards & Calvert, 2017), parents indicated that girls’ and boys’ current favorite media characters were often gendered stereotyped. The media characters that were popular among boys included superheroes such as Spiderman[©] and the Hulk[©] (24%), as well as characters based on video games such as Pokémon[™] and Minecraft[™] (17%). Popular characters for girls included Disney[®] princesses such as Sophia the First[™], and Elsa and Anna[™] from the Disney[®] movie Frozen[©] (24%). Characters from the popular television program, My Little Pony[™], were also popular favorites among girls (12%).

Dimensions of U.S. Children’s PSRs via Parent Report

To examine parent reports of the dimensions that comprise 6- to 8-year-old children’s PSRs, we conducted a principal components analysis with a varimax

rotation on the potential PSR items, which was the same analysis method employed in both Bond and Calvert (2014a) and Richards and Calvert (2016). Using a retention criterion of eigenvalues greater than 1.0, the model revealed a four-factor solution, with a fifth factor approaching retention. This fifth factor consisted of only one item, “[Child] perceives [character] as funny.” Because of the weakness associated with one-item factors, this item was dropped from all remaining analyses. One other item (“[Child] thinks that [character] has thoughts and emotions”) was removed from the initial solution because it cross-loaded across two dimensions.

A scree plot confirmed the four-factor solution, which is summarized in Table 2. Fifteen items contributed to the four factors and accounted for 67.85% of the total variance in parent perceptions of preschool and school age children’s PSRs. The amount of variance captured in this solution is within the 59% to 70% range of total variance accounted for in previous parent report measures of 3- to 4-year-old children’s PSRs (Bond & Calvert, 2014a; Richards & Calvert, 2016). Reliability analyses showed acceptable internal consistencies for all four dimensions (social realism: $\alpha = .87$; attachment and character personification: $\alpha = .80$; human-like needs: $\alpha = .83$; and character qualities: $\alpha = .78$).

Replicated dimensions in parent perceptions of children’s PSRs. Our first hypothesis addressed parent reported dimensions of preschool and school age children’s PSRs. As predicted, the factor loadings in the current study closely replicated Richards and Calvert’s (2016) three dimensions of social realism, attachment and character personification, and human-like needs (see Table 2).

The emergence of social realism as a factor replicates earlier factor analyses by both Bond and Calvert (2014a) and Richards and Calvert (2016). This dimension consisted of three items designed to assess the degree to which parents perceive children as experiencing their favorite media character as real or imaginary, accounting for 11.53% of the total variance. Examination of the loadings for individual items revealed that this dimension showed the least amount of deviation from the previous studies.

As found by Richards and Calvert (2016), attachment and character personification was the largest contributing factor to parent perceptions of children’s PSRs, accounting for 32.73% of the total variance in the current study and 36% of the variance in Richards and Calvert (2016). This dimension consisted of a combination of six items that assessed the extent to which parents perceived children as treating their favorite media character as a trusted friend, capable of providing them with comfort and emotional security.

Consistent with Richards and Calvert (2016), human-like needs emerged as a separate dimension of parent perceptions of preschool and school age children’s PSRs, accounting for 9.03% of the total variance. The human-like needs dimension included two items assessing the extent to which children viewed their

Table 2. Factor Analysis of Parent's Perceptions of Their Child's New or Ongoing Parasocial Relationships With a Favorite Media Character.

Factor	Eigen values	% of variance explained	Item	Factor loadings	M	SD
Attachment and character personification $\alpha = .80$	4.91	32.73	"[Character] makes [child] feel comfortable."	.85	-.09	0.94
			"[Character] makes [child] feel safe."	.75	.03	0.99
			"The voice of [character] soothes [child]."	.65	-.03	0.98
			"[Child] gets sad when [character] gets sad or makes a mistake."	.60	.20	1.11
			"[Child] trusts [character]."	.59	.28	1.03
Character qualities $\alpha = .78$	2.18	14.56	"[Child] treats [character] as a friend."	.55	.18	1.15
			"[Child] perceives [character] as smart."	.07	.13	0.86
			"[Child] perceives [character] as strong."	.14	-.10	0.86
			"[Child] perceives [character] as nice."	.24	.07	0.85
			"[Child] thinks that [character] is pretty, cute, or attractive."	.10	-.01	1.20

(continued)

Table 2. Continued

Factor	Eigen values	% of variance explained	Item	Factor loadings	M	SD		
Social realism	1.73	11.53	"[Child] believes that [character] is real."	.10	.91	.11	2.26	1.24
$\alpha = .87$			"[Child] knows that [character] is imaginary." ^a	.004	.88	.11	1.85	1.02
			"When [character] acts out a behavior on a screen (like dancing, singing, or playing a game), [child] believes that [character] is performing the behavior in real life."	.22	.81	.17	2.43	1.06
Human-like needs	1.36	9.03	"[Child] believes that [character] has wants."	.08	.17	.95	3.59	1.09
$\alpha = .83$			"[Child] believes that [character] has needs."	.15	.13	.93	3.53	1.10

Note. "[Child] perceives [character] as funny" was dropped because it was the only item that loaded onto a fifth dimension. The item "[Child] thinks that [character] has thoughts and emotions" was also dropped because it cross-loaded across two dimensions.

^aItem was reverse coded.

Note. the strength of the item is determined by the numeric value of the loading (in bold), which ranges from -1 to +1, with numbers closer to +/- 1 indicating a stronger loading on a given dimension.

favorite media character as having needs and desires. The replication of this factor provides converging evidence that human-like needs are a separate dimension of PSRs that remains present in parent reports, even as children mature.

According to parent report, 11% of children in the current sample retained the same favorite media characters as reported in the original studies (Bond & Calvert, 2014a; Richards & Calvert, 2016). These children did not differ in age (*mean age* = 6.50 years, *SD* = 1.79 years) from the other children with favorite media characters (*mean age* = 6.24 years, *SD* = 1.37 years). Although the percent of children who retained their favorite characters is small compared with the rest of the sample, this finding suggests that at least some children retain their close relationships to favorite media characters as they age.⁴

A new dimension in parent perceptions of children's PSRs. As hypothesized, *character qualities* emerged as a fourth new dimension among parent perceptions of pre-school and school age children's PSRs. These qualities are smart, attractive, strong, and nice. In the current study, four items adapted by Bond and Calvert (2014a) from Hoffner's (1996) character traits measure loaded strongly onto a character qualities dimension, accounting for 14.56% of the overall variance.

Proportion of variance in dimensions across studies. There were differences in the amount of variance for specific factors as children matured. Specifically, the portion of the variance accounted for by parent perceptions of social realism in the current study (12%) was lower than in Richards and Calvert's (2016) parent report measure (20%) but similar to the variance reported by Bond and Calvert (2014a; 14%). The attachment and character personification dimension yielded a similar amount of variance explained for the current study (33%) and for Richards and Calvert (2016; 36%). The human-like needs dimension accounted for 14% of the variance in Richards and Calvert (2016) and 9% of the variance in the current study.

Age and Gender Differences

Because recontacted parents reported on boys and girls from a wide age range, we were interested in how parent reports of the dimensions of children's PSRs might vary by age and gender. Consistent with the approach of Richards and Calvert (2016), we computed composite scores by averaging the raw scores for each of the items within the four dimensions of social realism, attachment and character personification, human-like needs, and character qualities.

As found by Richards and Calvert (2016), age was negatively correlated with social realism, $r = -.34$, $p < .01$. According to parents, younger children were significantly more likely to view their favorite characters as real compared with older children. No other age related differences were found, $ps > .05$.

Our hypothesis that parents would perceive girls as being more likely to experience their favorite media characters as having wants and needs than boys was not supported. In fact, no gender differences were found for social realism, attachment and character personification, and human-like needs, $ps > .05$. However, scores for character qualities were significantly higher for girls compared with boys, $t(86) = -2.55, p = .01$, Cohen's $d = .56$. An individual item analysis revealed that this difference was driven by the item, "[Child] thinks that [character] is pretty, cute or attractive." As predicted, parents reported that girls ($M = 4.00, SD = 0.97$) were significantly more likely to view their favorite characters as attractive compared with boys ($M = 2.87, SD = 1.17$), $t(73.11) = -4.85, p < .001$, Cohen's $d = 1.05$.

Summary of Findings

Overall, the dimensions of preschool and school age children's PSRs were consistent with Richards and Calvert (2016). Three years later, parents perceived children's PSRs as consisting of social realism, attachment and character personification, and human-like needs. According to parents, the majority of children (89%) had formed new PSRs with different media characters, though a number of children (11%) retained the same favorite. A new dimension of *character qualities* also emerged in parent perceptions of older preschool and school age children's PSRs.

Discussion

In our media rich culture, children engage with media characters across a wide range of platforms, including television and mobile apps. For young children, access to media facilitates the development of one-sided, emotionally tinged relationships with these media characters, known as PSRs (Hoffner, 2008). Understanding PSRs in young children is of growing importance, given the associations between PSRs and their subsequent learning from more traditional media platforms, such as television and video presentations (Calvert et al., 2014; Gola et al., 2013; Lauricella et al., 2011; Schlesinger, Flynn, & Richert, 2016). For example, Lauricella et al. (2011) found that toddlers were best able to perform a seriation, sequencing task when learning from a video presented by a well-known and popular media character (Elmo from *Sesame Street*) compared with a video presented by an unfamiliar media character (DoDo, a puppet popular in Taiwan). In subsequent studies, children who had stronger PSRs with these characters, as measured by emotionally responding to puppets or interactive toys during play, later performed better on a seriation, sequencing task that was presented via a video featuring that character (Calvert et al., 2014; Gola et al., 2013). Consistent with these findings, the more preschool age children trusted a well-known television character, the more likely young children

were to transfer knowledge learned from that character to tasks with real-world objects (Schlesinger et al., 2016). Preschool-aged children also learned more math concepts from an intelligent agent prototype of Dora the Explorer™, a popular media character, when their attachment and friendship PSR scores with her were stronger (Calvert et al., 2018).

Recent parent report studies indicate that young children's PSRs are multidimensional constructs consisting of three dimensions (Bond & Calvert, 2014a; Richards & Calvert, 2016). As hypothesized, our findings largely replicate the dimensions found by Richards and Calvert (2016), in which parent perceptions of children's PSRs consist of social realism, attachment and character personification, and human-like needs. The replication of these three dimensions marks a consistent refinement of Bond and Calvert's (2014a) initial findings and is strengthened by the inclusion of their recontacted sample in the current follow-up study. Across the three studies, parent reports indicated that the dimensions that comprise children's PSRs were similar, even among two different samples of predominately 6- to 8-year-old children who had often formed new relationships with different media characters.

As predicted, a new dimension of character qualities emerged in parent perceptions of preschool and school age children's PSRs. Hints of this fourth dimension were found in previous studies of older children (Hoffner, 1996) and via parent reports of younger children's PSRs, with a single item about a character's attractiveness loading onto a separate dimension, which was subsequently dropped (Bond & Calvert, 2014a; Richards & Calvert, 2016).

Dimensions of Children's PSRs

Social realism. Of the three dimensions we replicated, social realism was the most consistent across all three studies. This dimension emerged in the past two parent report studies (Bond & Calvert, 2014a; Richards & Calvert, 2016) and in the current study in ways that are similar. In all three studies (past and current), the same three items loaded onto a separate dimension, accounting for 12% to 20% of the overall variance in children's PSRs (Bond & Calvert, 2014a; Richards & Calvert, 2016).

Overall, this finding is consistent with the emergence of social realism found in child report measures (see Richards & Calvert, 2016, 2017). For example, in a study directly comparing parent and child report measures of PSR, Richards and Calvert (2016) found that both parent and child reports yielded the dimension of social realism. The replication of this dimension highlights the consistency of social realism in children's PSRs with media characters and lends additional support to the importance of social realism in potentially strengthening PSI, as indicated in research by Rosaen and Dibble (2008) with school-age children.

As found by both Richards and Calvert (2016) and Rosaen and Dibble (2008), age was correlated with the social realism. In the current study, parents indicated that younger children were more likely to perceive their favorite media character as more real compared with older children. In Rosaen and Dibble's (2008) study with school-age children, the adult ratings of social realism among children's favorite media characters were also negatively correlated with age. Adult ratings indicated that younger children's favorite media characters appeared and behaved in ways that were less socially real than other children's favorite media characters. In adults, findings suggest that perceptions of social realism remain an important component of the ability to suspend reality and emotionally engage with digital characters (Blascovich & Bailenson, 2011). Therefore, we suspect that social realism might continue to be a factor in children's perceptions of media characters, even as they form a more mature understanding of fantasy and reality.

Children might view media characters as lifelike in part because of how they are designed (Calvert & Richards, 2014). In contemporary children's television programs, a sense of social contingency through PSI may occur by having characters gaze directly into the camera and pause after posing a question to give children the opportunity to respond (Lauricella et al., 2011). Parents might add to this sense of social realism by encouraging their children to think of media characters as having emotions (Bond & Calvert, 2014a). Children can also engage in face-to-face interactions with media characters in theme parks where actors dress up and playact their roles (e.g., meeting Mickey MouseTM at Disneyland[®]; Richards & Calvert, 2016). Therefore, it is not surprising that social realism is a consistent dimension of children's PSRs (Calvert, 2017).

Attachment and character personification. As hypothesized, items assessing trust, comfort, and security loaded onto the attachment and character personification dimension in ways that were consistent with findings by Richards and Calvert's (2016) parent report measure, accounting for the largest amount of variance in preschool and school age children's PSRs. This finding is also consistent with Bond and Calvert's (2014a) original parent report study, in which the separate dimensions of attachment and character personification together accounted for nearly half of the total variance in children's PSRs.

In the current study, this parent reported dimension of attachment and character personification in younger children's PSRs is similar to the items assessing PSRs found in Rosaen et al.'s study with 5- to 16-year-old children. In this study, children's comfort and friendship with their favorite media characters loaded onto a single dimension that was referred to as *positive PSR*. However, Rosaen et al.'s (2011) dimension also included items about intimacy (i.e., the ease with which children could talk to media characters), as well as social integration (i.e., the characters would fit in with children's peer groups) and social

understanding (i.e., the media characters understand what children want to know). Although these items were adapted from adult studies of PSI (i.e., Rubin & Perse, 1987a), they overlap with items assessing children's friendships with real peers (e.g., Furman & Burhmester, 1985).

Overall, our current findings indicate that attachment and character personification are part of parent perceptions of older and younger children's PSRs. This result parallels theoretical perspectives and empirical research on children's friendships with real peers (e.g., Ainsworth, Blehar, Waters, & Wall, 1978; Furman, 1996). Theorist such as Ainsworth et al. (1978) and Sullivan (1953) believed that children's real friendships afford opportunities for security, intimacy, and empathic understanding that serve as a basis for mature relationships in adulthood. Across developmental time frames, dimensions of trust, support, and nurturance are central features of children's high-quality friendships with real peers (Furman, 1996). The emergence of this dimension and similar dimensions across parent and child report measures (e.g., Bond & Calvert, 2014a; Richards & Calvert, 2016, 2017; Rosaen et al., 2011) suggest that media characters can afford social opportunities similar to real friendships (Giles, 2002).

Human-like needs. We hypothesized that parent perceptions of human-like needs might diminish in importance, especially for boys who tend to choose more traditionally masculine characters as favorites (Bond & Calvert, 2014b). This hypothesis was based on a study of parasocial breakups (Bond & Calvert, 2014b), in which parents reported that when preschool-aged boys broke up with media characters, their new favorite media characters were rated as significantly more masculine. However, parents of both older boys and girls reported that their children perceived their favorite media character as having human-like needs, as previously found in parent reports of younger children (Richards & Calvert, 2016).

The lack of age and gender differences on this dimension is particularly noteworthy given the ways in which human-like needs are manifested in behavioral studies of children's PSRs (Calvert et al., 2014; Gola et al., 2013). In these studies, toddlers treat plush toy versions of media characters as having human-like needs by engaging in caretaking behaviors with these toys, such as pretending to feed the toys or putting the toys to bed (Calvert et al., 2014; Gola et al., 2013). Our findings could be due to differences in the ways children and their parents are asked to report on human-like needs (Richards & Calvert, 2016). For parents, the items designed to assess human-like needs are more abstract and suggest psychological needs (e.g., does the character have wants and needs), whereas in children, these items are designed in more concrete biological terms that they can readily understand (e.g., does the character get hungry and sleepy; Richards & Calvert, 2016). Understanding abstract concepts about human psychological needs increasingly emerges with age for all children (see Wellman, 1992 for a review).

Character qualities. In this recontact study, character qualities emerged as a new dimension among parent reports of older preschool and school age children's PSRs. This dimension included being perceived as attractive, nice, smart, and strong. Although attachment and character personification continued to explain the most variance in children's PSRs in the current study, character qualities were the second largest dimension in our model, accounting for more variance than either social realism or human-like needs.

Traces of this dimension were found in the original parent report measure developed by Bond and Calvert (2014a) as well as in Richards and Calvert's parent report measure (2016), in which the single item assessing physical attractiveness loaded onto a separate dimension and was subsequently dropped from the models. In addition, a similar item assessing physical attractiveness loaded onto a dimension of attachment and friendship in young children's self-report measures (i.e., Richards & Calvert, 2016, 2017). Other research documents the importance that attraction plays in the development of PSR (Giles, 2002; Hoffner, 1996; Nordland, 1978; Rubin & McHugh, 1987), even among younger children. However, in a study with adults, Rubin and McHugh (1987) found that other aspects of attraction (e.g., social attraction) were more strongly associated with the development of PSI than physical attractiveness (as cited in Giles, 2002). The full emergence of character qualities in the current study suggests that other traits and social qualities, such as intelligence, strength, and kindness, might also draw young children to develop PSRs with media characters (Hoffner, 1996).

It is important to note that the items used to assess character qualities in the study were derived from Hoffner's (1996) study of older children's wishful identification with media characters. Wishful identification with media characters is typically considered a separate construct from children's PSRs (Giles, 2002). The emergence of this dimension in parent perceptions of children's PSRs suggests that there might be more overlap between wishful identification and PSR than has been previously theorized (Giles, 2002). In future research, it would be valuable to further clarify the distinct and overlapping ways in which PSRs and wishful identification with media characters develops in young children.

Limitations and Future Research Directions

Given the emergence of a new character qualities dimension in parent perceptions of preschool and school age children's PSRs, future research should replicate this new dimension using longitudinal or sequential cohort designs. Richards and Calvert (2016) did not include the full set of items adapted by Bond and Calvert (2014a) from Hoffner (1996) because they wanted to constrain the number of items asked of the young children in their sample to compare responses to those of their parents. Therefore, it is not entirely clear that the character qualities dimension emerged due to the increased maturity of our follow-up sample.

The use of parent report measure is another potential limitation of this research. Because parents and children do not always agree as to which character is a current favorite (see Richards & Calvert, 2016), it would be invaluable in future research to follow up with both parents and their children over time. As children mature and become more independent from their parents, it is possible that their experiences with their favorite media characters might depart from what their parents' can directly observe. Despite disagreements regarding children's favorite media characters, however, both parents and their children respond to items designed to assess the dimensions of PSRs in ways that are similar (Richards & Calvert, 2016). More importantly, it is only through parent measures that we can obtain a window into the earliest PSRs that young children develop.

Our findings are also descriptive in nature. Because the components that comprise parent perceptions of children's PSRs vary somewhat across studies (Bond & Calvert, 2014a; Richards & Calvert, 2016), we could not examine statistical changes in parent perceptions of children's PSRs over time. Indeed, one of our primary aims was to clarify the dimensions that comprise children's PSRs using a parent report measure. Given the results of this study, future research should examine changes in the variance components in both parents' and children's perceptions of children's PSRs over time. With a larger sample, it would also be possible to examine how parent perceptions and children's perceptions of children's PSRs vary both by age and by gender through separate principal component analyses.

Many children also create imaginary companions, invisible friends, or personified objects that children imbue with personalities (see Taylor, 1999). Descriptive reports of children's imaginary companions indicate that these relationships share similarities with children's real and PSRs. For instance, young children view both their real and imaginary friends as affording opportunities for trust and companionship, and children frequently describe their imaginary friends in ways similar to attachment figures, providing comfort and security during difficult times (Aguiar, Mottweiler, Taylor, & Fisher, 2017; Gleason & Hohmann, 2006). Unlike children's PSRs, most preschool-age children clearly recognize that their imaginary friends are not real (Taylor, 1999). Future research is needed to examine the similarities and differences between friendships based on media characters and friendships that children create with imaginary companions.

Finally, measurement issues continue to be of importance in this area of research. Changing definitions of terms (e.g., PSI and PSR), the potential relations among different areas of research (e.g., PSI, PSR, wishful identification), and the role development plays in the qualities and behaviors that characterize children's PSRs need to be delineated. Further, the combination of factor analyses and growth models is needed to shed additional light on the changes in the dimensions that comprise children's PSRs over time. It would also be valuable to

expand the number of studies that examine the relation between parent and child report measures, in addition to behavioral indices of PSRs.

Conclusion

The PSI and PSR research areas have evolved over time, from an adult viewer watching a television newscaster who appears to speak directly to them, to children who have close PSRs with media characters who engage them in pseudo PSIs to teach academic content. While our knowledge of adults is well developed, little is known about children's PSRs, including the underlying dimensions of those relationships.

The current study moves the needle forward by recontacting children's parents 3 years after an initial survey about their young children's PSRs. In this recontact study, we replicated earlier dimensions of social realism, attachment and character personification, and human-like needs in parent reports of their children's earlier PSRs as well as added a new dimension of character qualities that is consistent with work conducted on wishful identification by Hoffner (1996). Our results suggest that parents perceive preschool and school age children as being drawn to, and having relationships with, media characters in ways that parallel real friendships. These parallels between real friendships and children's PSRs support the argument that children's favorite media characters should be considered an important part of children's real social networks (Giles, 2002), as they fill both cognitive and social needs for them.

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Notes

1. Note that in what follows, we use the specific terms of the scholars who conducted the research, even though the use of terms changed over time (i.e., PSI was separated into PSR and PSI).
2. $N = 155$; date of birth was not reported for one child.
3. One item, "[Child] knows that [character] is imaginary" was reverse coded (see Table 2).
4. We ran a separate principal component analysis excluding children who had retained the same favorite media character over time, as per parent report. The results were unchanged.

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Sandra L. Calvert, PhD, is professor of Psychology at Georgetown University and director of the Children's Digital Media Center. She has authored seven books and more than 100 articles and book chapters in the children's digital media area. Her current research, funded by the National Science Foundation, studies the effects of young children's relationships with media characters on math skills and health outcomes. Professor Calvert is a fellow of the American Psychological Association and the International Communication Association.