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Adult attachment and transportation into narrative worlds

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Abstract

Adult attachment affects close bonds, including bonds with fictional characters, but does it also influence the level of engagement with fictional worlds? This article aims to build on previous research on how attachment relates to narrative transportation. In Study 1, attachment anxiety, but not attachment avoidance, predicted a greater tendency to become transported into narratives, even after controlling for broader personality traits related to attachment. In Study 2, attachment anxiety again predicted a greater tendency to engage in narratives but only at high levels of attachment avoidance. In Study 3, this interaction between attachment anxiety and attachment avoidance in predicting narrative transportation was again observed when transportation was measured immediately after viewing a specific narrative.

Numerous studies have shown that early childhood attachment can influence adult relationships with significant others, friends, siblings, and even total strangers (e.g., Fraley, Roisman, Booth-LaForce, Owen, & Holland, 2013; Roisman, Collins, Sroufe, & Egeland, 2005; Simpson, Collins, & Salvatore, 2011). Specifically, early insecurities about caregiver availability and affection can influence adult levels of attachment anxiety (characterized by hypervigilance and preoccupation with relationships) and attachment avoidance (characterized by suppression and avoidance of relationship-related content and needs), with both affecting the nature and quality of adult relationships. This influence also seems to extend beyond "real-world" relationships, applying to the symbolic relationships people have with social surrogates: nonhuman or fictional targets that fulfill social needs (Derrick, Gabriel, & Hugenberg, 2009). A growing body of work shows that individuals who are high in attachment anxiety tend to form stronger emotional bonds with cherished television characters, a bond commonly known as a parasocial relationship (Cohen, 2004; Cole & Leets, 1999; Greenwood, 2008; Greenwood & Long, 2011; Greenwood, Pietromonaco, & Long, 2008). But does attachment also affect how involved people become with the wider world of a fictional story beyond specific characters? In other words, does attachment influence our engagement with stories or just with story characters? The former may indeed hold true as one study found that attachment anxiety predicts a trait tendency to become engaged with narratives (Greenwood, 2008). More work on this topic would be welcome, however, as questions remain. For example, is this effect unique from the influence of general anxiety? How does attachment relate to engagement with a specific narrative world in contrast to retrospective reports of general

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tendencies? These studies seek to replicate and extend existing research on attachment and narrative engagement by addressing these questions.

Adult attachment

Adult attachment theory proposes that early caregiver–infant interactions lead to individual differences in attachment orientations, which in turn shape how people experience close relationships as adults (Mikulincer & Shaver, 2007a). Specifically, behavior, affect, expectations, and perceptions in emotionally intimate relationships are guided by two conceptual dimensions: attachment avoidance and attachment anxiety (Brennan, Clark, & Shaver, 1998). These two attachment dimensions represent differential responses to the activation of the attachment system (Fraley & Shaver, 2000), which typically occurs in response to psychological and physical threats, prompting individuals to seek support from others (Bowlby, 1982).

High attachment avoidance is characterized by a chronic tendency to deactivate the attachment system by engaging in various defensive strategies to limit the expression and experience of emotion (Edelstein & Shaver, 2004; Fraley, Davis, & Shaver, 1998). For example, individuals who are high in attachment avoidance may divert attention away from attachment-related information (Edelstein & Gillath, 2008), suppress thoughts and memories related to relationships (Fraley et al., 1998), and lower their expectations of social rewards (Spielmann, Maxwell, MacDonald, & Baratta, 2013). Consistent with these strategies, individuals who are high in attachment avoidance report being uncomfortable with intimacy and express a preference for independence and self-reliance (Brennan et al., 1998; Friedman et al., 2010). This attachment orientation is believed to develop during early childhood in response to a caregiver who is largely unresponsive to his/her child's needs for affection and support (Fraley et al., 2013). As a result, the child learns to supress these needs, and bonding between the caregiver and the child is limited.

High attachment anxiety is characterized by a chronic hyperactivation of the attachment system. Individuals who are high in attachment anxiety wish to minimize physical, emotional, and cognitive distance between themselves and their partners by engaging in demanding or controlling behavior in an effort to gain attention and support (Fraley & Shaver, 2000). These individuals are hypervigilant to attachment-related content (Edelstein & Gillath, 2008), tend to be preoccupied with relationships, and have a strong desire for emotional intimacy (Mikulincer & Shaver, 2007a). This attachment orientation is believed to result from unpredictable caregiver responses to a child's attempts to gain affection and safety (e.g., because of a depressed caregiver; Fraley et al., 2013). This inconsistency and uncertainty creates anxiety about the availability of the caregiver, and the child increasingly behaves in an attention-seeking manner in order to maximize contact with the caregiver.

Both the deactivating and hyperactivating strategies are considered forms of insecure attachment in that they result in dysfunctional emotional, cognitive, and behavioral patterns that are detrimental to relationships and can lead to interpersonal difficulties (e.g., Vicary & Fraley, 2007). For example, high attachment avoidance is associated with expectations of relationship failure and an aversion toward commitment (Birnie, McClure, Lydon, & Holmberg, 2009). Consequently, avoidant individuals are less committed to their romantic partners (Pistole, Clark, & Tubbs, 1995), offer less emotional support (Brennan et al., 1998), and experience less intimacy in their relationships (Tidwell, Reis, & Shaver, 1996). Not surprisingly, avoidantly attached individuals are more likely to have brief, unsatisfying relationships (Hazan & Shaver, 1987; Meyers & Landsberger, 2002). Attachment anxiety, the other form of attachment insecurity, is associated with sensitivity to relationship-threatening cues and frequent worrying about relationship stability (Campbell, Simpson, Boldry, & Kashy, 2005). This increases the frequency and intensity with which anxiously attached individuals experience negative emotions and intensifies their support-seeking efforts, which may ironically frustrate their partners and push

them away (Feeney & Collins, 2003). In fact, the demanding and overinvolved relationship style of anxiously attached individuals often leads to relationship dysfunction (Henderson, Bartholomew, Trinke, & Kwong, 2005). As a result of these approaches to intimacy, both avoidantly and anxiously attached individuals can find it difficult to satisfy their attachment needs.

Adult attachment and social surrogates

One way in which relational needs can be satisfied is through engagement with social surrogates, such as nonhuman or fictional targets (Derrick, 2013; Derrick et al., 2009; Epley, Waytz, & Cacioppo, 2007). Given the relatively low levels of risk and investment involved in using social surrogates, it seems plausible that this option would appeal to insecurely attached individuals as a nonthreatening way to fulfill social needs. Attachment orientations have been associated with various forms of social surrogacy in past research.

Inanimate objects

People may turn to objects in their environment for a source of social connection when others are unavailable to fulfill social needs (e.g., Epley, Akalis, Waytz, & Cacioppo, 2008; Epley et al., 2007; Gardner, Pickett, & Knowles, 2005; Zhou, Vohs, & Baumeister, 2009). Norris, Lambert, DeWall, and Fincham (2012) found that attachment anxiety, but not avoidance, predicted greater materialistic aspirations and values. Moreover, this relation between attachment anxiety and materialism appears to be partially mediated by loneliness, suggesting that anxiously attached individuals may be motivated to acquire possessions by a desire to fulfill social needs. In related work, attachment anxiety and avoidance were both higher among a clinical sample of hoarders compared to nonhoarders (Medard & Kellett, 2014). Thus, there is some preliminary evidence that insecurely attached individuals may use inanimate objects to fulfill social needs.

Comfort food

Food is another reliable and readily available nonhuman target that individuals may use to buffer themselves against social rejection and to gain a sense of social comfort (e.g., Baumeister, DeWall, Ciarocco, & Twenge, 2005; Oaten, Williams, Jones, & Zadro, 2008; Raspopow, Matheson, Abizaid, & Anisman, 2013; Troisi & Gabriel, 2011; Troisi, Gabriel, Derrick, & Geisler, 2015; Wansink, Cheney, & Chan, 2003). Are insecurely attached individuals more likely to use comfort food to satisfy their need to belong? Surprisingly, the use of comfort food as a social surrogate appears to be limited to those who are securely attached (Troisi & Gabriel, 2011; Troisi et al., 2015). Troisi and colleagues (Troisi & Gabriel, 2011; Troisi et al., 2015) have hypothesized that food that is frequently consumed in the presence of relational partners becomes associated with the social comfort one feels when around these individuals. As a result, the comforting effect of comfort food may be unique to securely attached individuals because they tend to have positive experiences with relationships, increasing the likelihood of creating positive associations between food and social comfort. Those who are not securely attached typically have negative or complicated emotional associations with relationship partners and so are less likely to develop these positive associations with food.

Pets

Pets constitute another example of a nonhuman, yet animate, target that has the potential to satisfy social needs (e.g., Epley, Akalis, et al. 2008; Epley, Waytz, Akalis, & Cacioppo, 2008; McConnell, Brown, Shoda, Stayton, & Martin, 2011; Zilcha-Mano, Mikulincer, & Shaver, 2011). Research on the relationship between pet ownership and attachment has yielded some complicated and mixed results. Specifically, it appears that owners' attachment insecurity is related to feelings of insecurity in their human–pet relationships (Zilcha-Mano et al., 2011; cf. Kurdek, 2008). Insecurely attached individuals may nevertheless develop strong emotional bonds with their pets. For example, those who are high in both attachment avoidance and anxiety experience greater grief severity within the first year of losing their pet (Field, Orsini,

Gavish, & Packman, 2009). Among people who lost their pet within the last 5 years, greater attachment avoidance was associated with greater feelings of social isolation as well as a lower frequency of seeking social support, suggesting that their pet may have served these social functions (Zilcha-Mano et al., 2011). (Interestingly, pet owners tend to score higher on attachment avoidance compared to nonowners; McConnell et al., 2011.)

Fictional characters

Not all social surrogates are tangible, with the implied presence of fictional others at times sufficient to facilitate a sense of belonging. For example, people turn to media to fulfill their social needs when they feel lonely (Derrick et al., 2009; Greenwood & Long, 2009; Jonason, Webster, & Lindsey, 2008). This may be based on the formation of psychologically and emotionally intimate bonds with fictional characters and media personas (Giles, 2002; Horton & Wohl, 1956). These one-sided parasocial relationships develop over time as characters "share" experiences with the viewer, leading to a sense of intimacy (Derrick, Gabriel, & Tippin, 2008). Moreover, as viewers come to know the mannerisms, personality, and motivations of characters, they feel that they understand the character and can predict his or her actions (Derrick et al., 2008; Stever, 2013). Despite the fact that parasocial relationships are imaginary, they share similarities with real-world relationships and can be psychologically real and meaningful (Cole & Leets, 1999; Derrick et al., 2008; Giles & Maltby, 2004; Stever, 2013, 2016). For example, the presence of a favorite television character can elicit social facilitation effects, which typically only occur in front of a human audience (Gardner & Knowles, 2008). These same effects do not occur in the presence of a nonfavorite television character, however, suggesting that this perceived "realness" is reserved for characters one likes and cares about. Thinking about a favorite television character can also reduce the negative effects of social rejection (Derrick et al., 2009).

More germane to the current discussion, these parasocial relationships may be similar to real-world relationships in terms of attachment behavior (Cole & Leets, 1999; Giles & Maltby, 2004; Stever, 2011, 2013). Specifically, viewers may come to see their favorite television character as a secure base that can provide a sense of safety. Consequently, they may try to increase their proximity to this character (e.g., read magazine articles about him/her) and protest when the availability of this character is threatened (e.g., by show cancellation). Taken together, these one-sided, parasocial relationships seem to be well suited to fulfilling the relational needs of insecurely attached individuals because these fictional characters can be summoned on demand and provide a sense of social connection with minimal risk for rejection. That being said, a past study found that only attachment anxiety predicts a tendency to engage in parasocial interaction, whereas attachment avoidance shows no such association (Greenwood, 2008; Greenwood & Long, 2011). People who are high in attachment anxiety and low in attachment avoidance tend to form stronger parasocial bonds (Cole & Leets, 1999; Greenwood et al., 2008; Theran, Newberg, & Gleason, 2010). These same individuals experience higher levels of distress in response to the potential loss of a favorite television character compared to those low in anxiety and high in avoidance (Cohen, 2004).

Fictional narratives

In addition to forming close bonds with specific fictional characters, anxiously attached individuals may also be more likely to become deeply immersed in the worlds those characters inhabit. This experience of becoming cognitively and emotionally involved in a narrative is known as narrative transportation (Gerrig, 1993; Green & Brock, 2002), and greater transportation predicts stronger tendencies to form parasocial relationships (Greenwood, 2008; Greenwood & Long, 2009). In fact, narrative transportation may be a prerequisite for developing a sense of closeness or connection with fictional characters (Green, Brock, & Kaufman, 2004). Specifically, as individuals become absorbed into a narrative world, they gain privileged access to characters' private thoughts, emotions, and goals, as well as their

personal and social histories, a process that relies on understanding and accepting the fictional world in which the character operates (Green et al., 2004). This deep immersion into a narrative world may help to satisfy anxiously attached individuals' desire to "merge" with others and know everything about them (Brennan et al., 1998). Additionally, becoming immersed into the world of a narrative helps to make the characters within it seem more real and therefore more capable of satisfying one's social needs. There is some evidence that anxiously attached individuals may use personally generated narratives to satisfy their attachment motives. Specifically, attachment anxiety predicts a greater frequency of engaging in sexual fantasies, with submission being a particularly prominent theme in these fantasies (Birnbaum, 2007). Submissive themes are consistent with the desire for connection to a stronger and wiser partner among the anxiously attached (Birnbaum, 2007). Taken together, past research suggests that individuals who are high in attachment anxiety are more likely to become transported into fictional narratives. In support of this idea, one study found that attachment anxiety is positively related to trait transportation (Greenwood, 2008). Interestingly, in this study, attachment avoidance also predicted greater transportation, but this association disappeared after controlling for attachment anxiety and other indicators of psychosocial functioning.

The Current Studies

In this article, we seek to build upon past work in three ways, by (a) ruling out the role of broader traits not specifically concerned with relationships, such as general neuroticism; (b) exploring whether the interaction between avoidance and anxiety predicts transportation; and (c) measuring transportation into a specific narrative in addition to relying on retrospective reports of trait tendencies.

To be more certain that it is the relational aspect of narratives that is responsible for the observed associations with attachment insecurity, it is both useful and theoretically meaningful to account for domain-general personality traits, such as those belonging to the Big Five model of personality. Practically speaking, the robust, positive correlation between attachment anxiety and neuroticism (Noftle & Shaver, 2006) means that the worries about interpersonal relationships represented by attachment anxiety are correlated with the tendency to experience negative affect more generally. Accounting for neuroticism increases the likelihood that the observed effects can be attributed more specifically to relationship-centered worries. Similarly, attachment avoidance is negatively correlated with the Big Five traits of extraversion, agreeableness, and conscientiousness (Noftle & Shaver, 2006). Accounting for the variance associated with the Big Five traits related to attachment would allow for greater certainty that it is the relational aspect of narratives that is related to avoidant responses. To isolate the relationship-specific aspect of trait tendencies, we control for the Big Five personality traits related to anxiety and avoidance when examining the relation between attachment and trait transportation, namely, Neuroticism, Extraversion, Agreeableness, and Conscientiousness (Studies 1–3). Additionally, in order to gain a more nuanced understanding of the relation between attachment insecurity and transportation, we also examine the interaction between anxiety and avoidance (e.g., Fraley & Bonanno, 2004).

Another manner in which the association between attachment and transportation can be clarified is by exploring state transportation into a specific narrative, in addition to retrospective reports of trait transportation into narratives in general. Relying on retrospective reports can be a particularly tricky issue when studying avoidantly attached individuals who have been shown to "forget" attachment-related information as a psychological defensive mechanism (Edelstein, 2006; Fraley, Garner, & Shaver, 2000; Simpson, Rholes, & Winterheld, 2010). For example, individuals high in avoidant attachment who were distressed while providing support to a romantic partner show memory deficits 1 week later, falsely recollecting that they were less supportive than they reported at the time (Simpson et al., 2010). It is therefore possible that the null association between avoidant

attachment and transportation found previously is the result of a failure to remember engaging with relational information, rather than a lack of true engagement. In order to explore this more directly, Study 3 employs the presentation of an actual narrative and measurement of engagement directly afterward to bypass any memory-suppression tendencies of avoidantly attached individuals. Thus, we move from the measurement of trait transportation in Studies 1 and 2 to the study of state transportation in Study 3.

The current studies investigated how attachment anxiety and attachment avoidance relate to narrative transportation, controlling for broader and related traits when examining trait transportation (Studies 1–3) and measuring state transportation in response to a specific narrative (Study 3). In Studies 1 and 2, we aimed to replicate the previously reported associations between attachment and trait transportation (Greenwood, 2008) and extend this work by examining whether these associations persist after controlling for the Big Five traits related to attachment. Doing so allows us to demonstrate that it is specifically relationship-oriented anxiety, and not anxiety per se, that predicts narrative transportation, for example. We further extended past work by investigating whether there is an interaction between attachment anxiety and attachment avoidance in predicting transportation. It may be, for example, that the association between anxiety and transportation is moderated by levels of avoidance, with anxiety being more closely linked to transportation at low levels of avoidance. A possible interaction between the attachment dimensions has not been previously explored by past research on this topic. In Study 3, we move from studying retrospective reports of trait transportation into narratives to state transportation into a specific piece of fiction. This latter approach will hopefully allow us to better investigate the role of attachment avoidance, circumventing potential memory biases that might influence the former. In addition, Study 3 employs a multidimensional approach to measuring transportation, allowing us to uncover how attachment relates to the various dimensions of narrative engagement.

Study 1

Study 1 examined how attachment relates to trait transportation, controlling for the Big Five personality traits and examining possible interactions between the two attachment dimensions.

Method

Participants

A total of 556 undergraduate students completed an online questionnaire study for course credit. From this initial sample, a total of 222 participants were removed. These exclusions were due to concerns over inattentive responding[1] ($N = 115$) or due to having an unusual study completion time[2] ($N = 8$). In addition, participants who did not indicate having a specific favorite television character were removed from the analyses ($N = 81$). A further 18 cases were removed because they represented the second time participants completed the study. All decisions regarding exclusions were made a priori before the data were analyzed. The final sample consisted of 334 participants (103 male), ranging in age from 17 to 42 ($M = 19.71$, $SD = 3.11$).

Measures

Trait transportation. The Fantasy subscale of the Interpersonal Reactivity Index (IRI; Davis, 1980) was used to assess the trait tendency to become transported into narratives. Although originally intended to measure a dimension of empathy, all but one[3] of the seven items

1. Defined as (a) those who did not report that the statement "I generally sleep more than 3 hr a week" describes them well (i.e., those who selected 1 [*does not describe me very well*] through 3 [*somewhat describes me*] on the provided 5-point Likert scale) and (b) those who skipped multiple items in a row within questionnaires.
2. Defined as those whose study completion times were over 3 *SD* away from the sample mean.
3. Removing this item ("I daydream and fantasize, with some regularity, about things that might happen to me") reduced Cronbach's alpha for the subscale ($\alpha = .78$), as well as the strength of the observed effects, although the pattern of results remained very much the same. In other words, attachment anxiety remained a positive predictor of trait transportation, with this effect being marginally significant ($B = .09$, $p = .06$).

on this subscale directly addresses a tendency to become absorbed into a fictional narrative world (e.g., "After seeing a play or movie, I have felt as though I were one of the characters"; "I really get involved with the feelings of the characters in a novel"; Mar, Oatley, Hirsh, dela Paz, & Peterson, 2006; Mar, Oatley, & Peterson, 2009; see Table 1). Responses were made on a 5-point Likert scale ranging from 1 (*does not describe me well*) to 5 (*describes me very well*), and an overall score was computed using all seven items.

Adult attachment. The Experiences in Close Relationships–Revised (ECR–R) scale (Fraley, Waller, & Brennan, 2000) was used to assess attachment anxiety and avoidance. The 18-item Anxiety subscale includes statements such as "I worry a lot about my relationships" and "I'm afraid that I will lose my partner's love." The 18-item Avoidance subscale includes items such as "I am nervous when partners get too close to me" and "I feel comfortable depending on romantic partners" (reverse coded). Responses were made on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Personality. The Big Five Inventory (BFI; John & Srivastava, 1999) was employed to assess the four Big Five traits that are related to attachment: Extraversion, Agreeableness, Conscientiousness, and Neuroticism (Openness was not included in the analyses because it has been shown to be unrelated to either attachment dimension; Noftle & Shaver, 2006). Participants were presented with a series of statements (e.g., "I see myself as someone who is depressed, blue") and asked to indicate the degree to which each statement accurately described them using a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Procedure

Participants completed all of the questionnaires online within the context of a larger study examining media use in relation to adult attachment. A second measure of attachment was also presented (Relationship Questionnaire [RQ]; Bartholomew & Horowitz, 1991), but because this article focuses on the two underlying dimensions of attachment, which are not measured in the RQ, only data from the ECR–R questionnaire are reported. In addition to the scales outlined above, participants also completed measures of parasocial interaction tendencies, reading habits, and loneliness, as well as an online shopping task.[4] The order of the questionnaires was randomized for each person, with the shopping task always appearing last.

Results and discussion

Descriptive statistics are reported in Table 1, and correlations among the measures are reported in Table 2. We first sought to examine the relation between the two attachment dimensions and trait transportation. We expected to replicate results from previous research by demonstrating that attachment anxiety, but not avoidance, would predict a greater tendency to become transported into narratives. In addition, to extend these results, we controlled for individual differences to examine whether it is specifically a preoccupation with relationships that drives the association between attachment anxiety and transportability. Lastly, to further extend previous research, we also examined whether there is an interaction between attachment anxiety and avoidance that predicts trait transportation, probing for possible moderation effects.

Zero-order correlations revealed that attachment anxiety, but not attachment avoidance, was associated with trait transportation, replicating past work (Table 2). In order to more closely examine these associations, a regression analysis was conducted to examine how anxiety and avoidance uniquely relate to the tendency to become engaged in narratives after controlling for broad personality traits and to explore any possible moderation in the form of an interaction between the two attachment dimensions (Table 3). Anxiety and avoidance scores were centered and entered into the first block (Aiken & West, 1991), and the interaction term between anxiety and

4. We would be happy to provide the data from these measures upon request.

Table 1. *Means and standard deviations of measures*

Measure	Min.	Max.	*M*	*SD*	Cronbach's α
Study 1					
IRI: Fantasy	1.14	5.00	3.49	0.74	.79
ECR–R: Anxiety	1.00	6.17	3.35	1.12	.93
ECR–R: Avoidance	1.00	6.00	2.97	1.01	.94
BFI: Extraversion	1.38	4.88	3.33	0.65	.82
BFI: Agreeableness	2.00	5.00	3.72	0.53	.77
BFI: Conscientiousness	1.56	5.00	3.36	0.55	.78
BFI: Neuroticism	1.00	4.88	3.03	0.71	.82
Study 2					
Transportability	2.05	8.8	6.04	1.09	.88
ECR–R: Anxiety	1.00	6.61	3.69	1.11	.92
ECR–R: Avoidance	1.06	6.50	3.13	1.05	.92
BFI: Extraversion	1.38	5.00	3.22	0.74	.81
BFI: Agreeableness	1.89	5.00	3.79	0.57	.74
BFI: Conscientiousness	1.67	5.00	3.43	0.62	.78
BFI: Neuroticism	1.12	4.62	2.83	0.76	.81
Study 3					
Attachment Anxiety	1.51	5.79	3.32	0.98	.95
Attachment Avoidance	1.22	5.88	3.47	0.75	.93
BFI: Extraversion	1.63	5.00	3.27	0.66	.79
BFI: Agreeableness	2.22	5.00	3.79	0.58	.75
BFI: Conscientiousness	1.67	5.00	3.46	0.67	.82
BFI: Neuroticism	1.00	4.75	2.96	0.73	.80
Narrative Engagement					
Total Score	1.17	7.00	5.10	0.88	.77
Narrative Understanding	1.00	7.00	5.62	1.43	.83
Attentional Focus	1.00	7.00	5.38	1.43	.87
Narrative Presence	1.00	7.00	4.61	1.50	.81
Emotional Engagement	1.00	7.00	4.80	1.24	.68

Note. IRI = Interpersonal Reactivity Index; ECR-R = Experiences in Close Relationships-Revised; BFI = Big Five Inventory.

avoidance was entered into the second block. In order to rule out the possibility that any observed effects were a function of overarching individual differences, such as the Big Five personality traits, we also controlled for Extraversion, Agreeableness, Conscientiousness, and Neuroticism—the four broad personality traits that are related to attachment anxiety and avoidance (Noftle & Shaver, 2006). All trait scores were centered, and interaction terms between each trait and attachment anxiety, as well as avoidance, were computed. The resultant 12 variables were entered into the third block of the regression analysis.

As expected, attachment anxiety predicted a greater tendency to become absorbed into narratives. These findings replicate past research and provide further support to the idea that individuals who are high in attachment anxiety are more likely to seek social surrogates and express interest in fictional worlds and characters (Greenwood, 2008). Importantly, this effect persisted even after controlling for Extraversion, Agreeableness, Conscientiousness, and Neuroticism. Neither attachment avoidance nor the interaction between anxiety and avoidance predicted trait transportation. This demonstrates that attachment anxiety uniquely predicts retrospective reports of trait transportation tendencies, controlling for general anxiety and any interaction with attachment avoidance.

Table 2. *Intercorrelations between measures of attachment, transportation, and the Big Five traits related to attachment*

Study 1 Measure	2	3	4	5	6	7
1. IRI: Fantasy	.15*	−.02	.11*	.04	−.14*	.17*
2. ECR-R: Anxiety		.47*	−.21*	−.17*	−.23*	.41*
3. ECR−R: Avoidance			−.24*	−.26*	−.19*	.21*
4. BFI: Extraversion				.14*	.21*	−.32*
5. BFI: Agreeableness					.29*	−.26*
6. BFI: Conscientiousness						−.36*
7. BFI: Neuroticism						

Study 2 Measure	2	3	4	5	6	7
1. Transportability	.11	−.10	.06	−.01	.01	.15*
2. ECR−R: Anxiety		.38*	−.16*	−.20*	−.28*	.42*
3. ECR−R: Avoidance			−.29*	−.21*	−.19*	.19*
4. BFI: Extraversion				.12*	.09	−.34*
5. BFI: Agreeableness					.35*	−.40*
6. BFI: Conscientiousness						−.25*
7. BFI: Neuroticism						

Study 3 Measure	2	3	4	5	6	7	8	9	10	11
1. Attachment Anxiety	.31*	−.28*	−.29*	−.39*	.57*	−.03	−.10	−.22*	.16*	.10
2. Attachment avoidance		−.42*	−.37*	−.08	.24*	−.14*	−.07	−.16*	.01	−.14*
3. BFI: Extraversion			.21*	.20*	−.22*	.15*	.12	.16*	.03	.07
4. BFI: Agreeableness				.29*	−.30*	.19*	−.01	.21*	.09	.20*
5. BFI: Conscientiousness					−.30*	.12	.03	.13*	.05	.09
6. BFI: Neuroticism						−.12	−.10	−.23*	.04	−.02
7. Narrative Engagement (total)							.58*	.65*	.66*	.63*
8. Narrative Understanding								.37*	.03	.05
9. Attentional Focus									.13	.11
10. Narrative Presence										.51*
11. Emotional Engagement										

Note. IRI = Interpersonal Reactivity Index; ECR-R = Experiences in Close Relationships-Revised; BFI = Big Five Inventory.
*$p \leq .05$.

Table 3. *Study 1: Examining the effects of attachment anxiety, avoidance, and their interaction on trait transportation, controlling for Extraversion, Agreeableness, Conscientiousness, and Neuroticism*

	Variable	*B*	*SE*	β	*t*
Model 1	Anxiety	0.13	0.04	0.20	3.25*
$R^2 = .03$	Avoidance	−0.08	0.05	−0.11	−1.78
$F(2, 331) = 5.31$*					
Model 2	Anxiety	0.14	0.04	0.22	3.50*
$R^2 = .04$	Avoidance	−0.07	0.05	−0.10	−1.57
$F(3, 330) = 4.84$*	Anxiety × Avoidance	0.08	0.04	0.11	1.95*
Model 3	Anxiety	0.10	0.04	0.14	2.13*
$R^2 = .07$	Avoidance	−0.05	0.05	−0.06	−0.99
$F(15, 318) = 2.76$*	Anxiety × Avoidance	0.07	0.05	0.10	1.52
	Extraversion	0.20	0.07	0.18	3.04*
	Agreeableness	0.15	0.08	0.11	1.83
	Conscientiousness	−0.16	0.08	−0.12	−2.04*
	Neuroticism	0.18	0.07	0.17	2.62*
	Anxiety × Extraversion	0.04	0.07	0.04	0.61
	Anxiety × Agreeableness	0.09	0.08	0.07	1.15
	Anxiety × Conscientiousness	0.07	0.09	0.06	0.77
	Anxiety × Neuroticism	0.06	0.06	0.07	0.97
	Avoidance × Extraversion	0.06	0.08	0.06	0.83
	Avoidance × Agreeableness	−0.06	0.08	−0.05	−0.70
	Avoidance × Conscientiousness	−0.04	0.09	−0.03	−0.41
	Avoidance × Neuroticism	0.01	0.07	0.02	0.20

*$p \leq .05$.

Study 2

Study 1 replicates and extends previous research on the association between adult attachment and trait transportability (Greenwood, 2008). Consistent with past work, attachment anxiety was found to be a positive predictor of the overall tendency to become transported into narratives, even after controlling for broader personality traits. However, it is important to note that the questionnaire we employed to measure trait transportation was not originally designed for this purpose, and many of the questions pertain to character identification.[5] Moreover, this scale references multiple forms of media (i.e., movies, books, plays), whereas previous research on attachment and transportation tendencies has only focused on visual media (i.e., television/movies; Greenwood, 2008).[5] In order to address these limitations and to make our results more relevant to previous work, we conducted a preregistered replication study. The aim of Study 2 was to replicate the results of Study 1 using a more typical measure of trait transportation that focuses on engagement with visual narratives (Dal Cin, Zanna, & Fong, 2004), one that was employed in the past study on this topic (Greenwood, 2008).

Method

Participants

A total of 369 undergraduate students completed an online questionnaire study for course credit. From this initial sample, a total of 84 participants were removed due to concerns

5. We would like to thank an anonymous reviewer for raising these concerns.

over inattentive responding[6] ($N = 77$) or due to having an unusual study completion time[2] ($N = 7$). All decisions regarding exclusions were made a priori, before the data were analyzed, based on steps outlined in our preregistration document. The final sample consisted of 285 participants (90 males, 1 unknown), ranging in age from 17 to 43 ($M = 20.08$, $SD = 3.42$).

Measures

Trait transportation. The film version of the Transportability Scale (Dal Cin, Zanna, & Fong, 2004) was used to measure individual differences in the tendency to become readily transported into visual narratives. This is a trait version of the Transportation Scale developed by Green and Brock (2000). Participants were presented with a series of 20 statements (e.g., "When watching movies/videos for pleasure: I get mentally involved in the story") and asked to indicate the degree to which each statement accurately described them using a 9-point Likert scale ranging from 1 (*strongly disagree*) to 9 (*strongly agree*).

Adult attachment. As in Study 1, the ECR–R scale (Fraley, Waller, & Brennan, 2000) was employed to assess attachment anxiety and avoidance.

Personality. The BFI (John & Srivastava, 1999) was again used to measure Extraversion, Agreeableness, Conscientiousness, and Neuroticism.

No other measures were administered in this study, aside from our demographics questionnaire. These measures, along with the analytical approach, were preregistered with the Open Science Framework (https://osf.io/mgp3h/).

Procedure

Participants completed all of the questionnaires online, and the order of the questionnaires was randomized for each person. All participants received partial course credit in exchange for their participation.

Results and discussion

Descriptive statistics are reported in Table 1, and correlations among the measures are reported in Table 2. We expected to replicate the results from Study 1, showing that attachment anxiety uniquely predicts a tendency to become absorbed in narratives. Zero-order correlations revealed a pattern of results that deviated somewhat from what has previously been observed. Consistent with Study 1, trait transportation was positively related to attachment anxiety, but in this study, transportation was also negatively related to attachment avoidance. Both correlations were small in magnitude and failed to attain the traditional threshold for statistical significance. This was surprising in light of previous findings.

We next repeated the same regression analysis that was conducted in Study 1 in order to examine the unique associations between attachment and trait transportation more closely while controlling for the influence of broad personality traits (Table 4). This analysis revealed that the interaction between anxiety and avoidance was a unique predictor of trait transportation and that this effect persisted even after controlling for Extraversion, Agreeableness, Conscientiousness, and Neuroticism. Specifically, it appears that although anxiety and trait transportation were unrelated at low levels of avoidance (25th percentile), $b = -0.05$, $t(269) = -0.62$, $p = .54$, the two were positively associated at high levels of avoidance (75th percentile), $b = 0.30$, $t(269) = 3.61$, $p < .001$ (Figure 1b). Thus, although attachment anxiety was found to be a positive predictor of trait transportation in Study 1, the results from Study 2 suggest that the positive association between attachment anxiety and transportation is moderated by attachment avoidance.

Although Study 2 was a preregistered attempt to replicate Study 1 using a more traditional measure of trait transportation and a cleaner design (i.e., including no other measures), the results of Study 2 appear somewhat

6. Defined as (a) those who did not follow the instructions on either of two items designed to catch inattentive responding ("Please click on *Disagree strongly* and proceed to the next question" and "Please click on *Agree* and proceed to the next question") and (b) anyone with over 10% of responses missing.

Table 4. *Study 2: Examining the effects of attachment anxiety, avoidance, and their interaction on trait transportation, controlling for Extraversion, Agreeableness, Conscientiousness, and Neuroticism*

	Variable	*B*	*SE*	β	*t*
Model 1	Anxiety	0.16	0.06	0.17	2.64*
$R^2 = .03$	Avoidance	−0.17	0.07	−0.16	−2.52*
$F(2, 282) = 4.84$*					
Model 2	Anxiety	0.21	0.06	0.21	3.38*
$R^2 = .08$	Avoidance	−0.17	0.06	−0.16	−2.60*
$F(3, 281) = 8.28$*	Anxiety × Avoidance	0.18	0.05	0.22	3.83*
Model 3	Anxiety	0.13	0.07	0.13	1.84
$R^2 = .14$	Avoidance	−0.15	0.07	−0.14	−2.05*
$F(15, 269) = 3.07$*	Anxiety × Avoidance	0.23	0.06	0.28	4.05*
	Extraversion	0.09	0.10	0.06	0.94
	Agreeableness	0.11	0.13	0.06	0.85
	Conscientiousness	0.04	0.11	0.02	0.37
	Neuroticism	0.30	0.10	0.21	2.92*
	Anxiety × Neuroticism	−0.00	0.09	−0.00	−0.04
	Anxiety × Extraversion	−0.06	0.09	−0.04	−0.66
	Anxiety × Conscientiousness	0.22	0.10	0.16	2.18*
	Anxiety × Agreeableness	0.10	0.12	0.06	0.87
	Avoidance × Neuroticism	−0.13	0.10	−0.11	−1.29
	Avoidance × Extraversion	0.07	0.09	0.06	0.82
	Avoidance × Conscientiousness	−0.06	0.11	−0.04	−0.56
	Avoidance × Agreeableness	−0.20	0.13	−0.13	−1.62

*$p \leq .05$.

different from those of Study 1. That said, it is important to note that an interaction between anxiety and avoidance was observed in Study 1, but this effect became much weaker after controlling for the attachment-related personality traits. Comparing the interaction plots from the two studies (Figures 1a and b), the pattern of results observed in Studies 1 and 2 is very similar and not at all contradictory. Both studies do in fact capture the same effect, but the size of this effect is somewhat smaller in Study 1 compared to Study 2.

In addition, the results from Study 2 do not fully replicate past findings, showing that attachment anxiety is a positive unique predictor of trait transportation (Greenwood, 2008). This discrepancy in results is less surprising, however, seeing as how this previous work did not examine the possible interaction between anxiety and avoidance. Study 2 therefore extends past research by demonstrating that attachment anxiety does in fact predict a greater tendency to engage with narratives but only when levels of attachment avoidance are also high. Moreover, this association remains even after controlling for attachment-related personality traits.

Study 3

Studies 1 and 2 extend previous research on the association between adult attachment and trait transportability (Greenwood, 2008). In Study 1, attachment anxiety was found to be a unique positive predictor of overall transportation tendencies after controlling for broad personality traits related to attachment. In Study 2, attachment anxiety was a positive predictor of the tendency to be transported into visual narratives, but only when levels of attachment avoidance were also high. (This moderation was also observed in Study 1, although

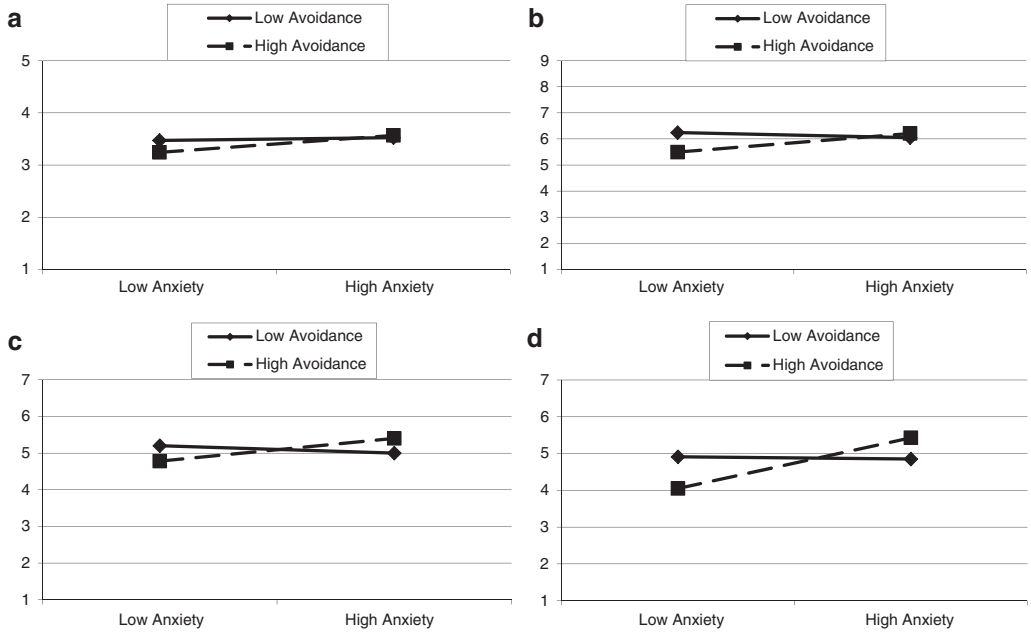

Figure 1. Transportation as a function of attachment anxiety and attachment avoidance, controlling for Extraversion, Agreeableness, Conscientiousness, and Neuroticism: (a) trait transportation (Study 1), (b) trait transportation (Study 2), (c) overall state transportation (Study 3), and (d) emotional engagement aspect of state transportation (Study 3).

it failed to reach the threshold for statistical significance.) Although Studies 1 and 2 demonstrate that people with different attachment orientations vary in their trait tendency to become immersed in narratives, the way in which attachment influences transportation into a specific, previously unencountered narrative remains unexamined. This latter form of transportation can be viewed as state transportation, in contrast to trait transportation. Importantly, measuring engagement soon after the presentation of an actual fictional narrative may provide a more sensitive measure of how attachment avoidance relates to transportation, circumventing the tendency for those high in avoidance to selectively forget episodes of relational engagement (Simpson et al., 2010). In this study, we also improved upon our measurement of transportation by employing a multidimensional measure of state transportation to assess viewer responses to two different short films. By using a more nuanced measure of transportation, we were able to examine more closely how the two attachment dimensions relate to different aspects of transportation.

Method

Participants

A total of 263 undergraduate students completed the study for course credit. Responses from 3 participants who had seen the target film before were not included in the analyses. Data from an additional 5 participants were removed as they experienced technical difficulties while watching the movie (e.g., the film failed to play on their computer). In addition, 19 participants were removed because their responses[1] ($N = 17$) or behavior in the lab ($N = 2$) suggested that they were not paying attention (i.e., 1 participant was observed using his cellphone while the film was playing, and another told the experimenter that he was responding indiscriminately to finish the study faster). Last, 4 participants who did not finish the study were also removed, resulting in a final sample of 232 participants (53 male[7]), ranging in age from 17

7. In light of previous work showing that gender moderates the association between attachment avoidance and

to 55 years ($M = 20.41$, $SD = 4.22$). All decisions regarding exclusions were made before any statistical analyses were conducted.

Materials

Video stimuli. Two short films were chosen as stimuli to examine how attachment style influences individuals' reaction to a narrative encountered for the first time. Employing two different films allowed us to examine whether these reactions generalize beyond a single target stimulus and/or portrayal of relationships. The first, *Mistletoe*, is 9 min and 7 s in length and describes the story of a man realizing his romantic feelings for a coworker. The film concludes with a happy outcome for the couple (finitefilms, 2011). The second film, *Sweet Night Good Heart*, is 9 min and 16 s in length. It portrays a man trying to break up with his girlfriend, who misunderstands his attempt as a proposal for marriage, only for him to realize his true feelings for her in the end. This film ends with a more ambiguous outcome, leaving the audience unaware of where these two characters stand as a couple (Goodman & Zeff, 2001). These two short films were chosen because they are roughly equivalent in length and both deal with romantic relationships while presenting somewhat different views on romance (one positive, one equivocal). Both films employed in this study focused on relationships as this type of content is the most likely to illustrate differences in transportation with respect to attachment. In a previous study, for example, attachment anxiety and avoidance were shown to be associated with different biological responses to films,but only when emotional intimacy was portrayed (Edelstein, Kean, & Chopik, 2012). Participants were randomly assigned to view only one of these films.

State transportation. Busselle and Bilandzic's (2009) 12-item Narrative Engagement scale was used to measure the degree to which participants became transported into the films. An overall transportation score can be calculated by averaging across all items. In addition, this scale distinguishes between four dimensions of narrative transportation: Narrative Understanding (e.g., "My understanding of the characters is unclear" [reverse coded]), Attentional Focus (e.g., "I had a hard time keeping my mind on the program" [reverse coded]), Narrative Presence (e.g., "During the program, my body was in the room, but my mind was inside the world created by the story"), and Emotional Engagement (e.g., "The story affected me emotionally"). Responses were made on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). This 12-item scale is highly correlated with Green and Brock's (2000) Transportation Scale ($rs = .73–86$; Busselle & Bilandzic, 2009). In addition, a recent study employed psychophysiological measures to support the validity of this scale's multidimensional conceptualization of narrative engagement (Sukalla, Bilandzic, Bolls, & Busselle, 2015). This measure was chosen because it was specifically designed to measure engagement with visual media. In addition, the measure's ability to distinguish between different aspects of narrative engagement permits a more fine-grained analysis of how attachment relates to the various dimensions of transportation. Exploring these separate dimensions could help shed light on exactly how attachment predicts transportation.

Adult attachment. Two measures were used to assess attachment. The ECR–R scale (Fraley, Waller, & Brennan, 2000) was once again used to assess attachment anxiety and avoidance. In addition, the Attachment Style Questionnaire (ASQ; Feeney, Noller, & Hanrahan, 1994) was

viewer response to films (Edelstein et al., 2012), we ran a series of multiple regression analyses to examine whether this was the case in our study. Specifically, attachment anxiety, attachment avoidance, and gender were all centered, and two-way and three-way interaction terms between these three variables were computed. We found that gender did not moderate the association between attachment anxiety and/or avoidance with respect to overall state transportation or any of its four aspects (all $ps > .16$). We also examined gender differences in isolation using a series of Welch's two-sample t tests to see whether males and females differed in their responses to the films. On average, male participants felt that they understood the films better than did female participants, $t(113.36) = 2.27$, $p = .02$, $d = .30$, 95% CI [.05, .56]. However, there were no gender differences in overall state transportation or its remaining three aspects ($ds = .00–.11$, all $ps > .41$).

used as a second measure of the two attachment dimensions. For the ASQ, a 13-item subscale was used to capture attachment anxiety (e.g., "I worry that others won't care about me as much as I care about them"), and a 16-item subscale was used to assess attachment avoidance (e.g., "I find it hard to trust other people"). Responses were made using a 6-point Likert scale, ranging from 1 (*totally disagree*) to 6 (*totally agree*).

Personality. As in Studies 1 and 2, the BFI (John & Srivastava, 1999) was employed to assess Extraversion, Agreeableness, Conscientiousness, and Neuroticism.

Procedure

Upon their arrival in the laboratory, participants were led to a computer where they were randomly assigned to watch one of the two short films. Following their informed consent, all participants completed the attachment and personality measures, which were randomized in order. Participants then watched the film and completed the Narrative Engagement scale. In addition, participants completed a number of questionnaires not germane to the purpose of the current study after the transportation measure. These included measures of mood, loneliness, need to belong, interpersonal support, relationship status, and retention of film content.[4] Last, the participants completed a set of demographic questions and were debriefed upon completion of the study.

Results and discussion

Descriptive statistics for all measures are reported in Table 1, and correlations among the measures are reported in Table 2. Participants' scores on the ECR–R Anxiety subscale were highly correlated with the anxiety scores derived using the ASQ ($r = .82$, $p < .001$). As a result, the two subscales were averaged to create an aggregate score for attachment anxiety. This new aggregate score was highly correlated with both original attachment anxiety subscales (ECR–R: $r = .97$; ASQ: $r = .94$, both $ps < .001$). Similarly, avoidance scores on the two measures were also closely related ($r = .79$, $p < .001$) and were averaged to create an aggregate attachment avoidance score. This new score was highly related to participants' avoidance ratings on the ECR–R and the ASQ ($r = .97$, $r = .92$, respectively, both $ps < .001$).

Studies 1 and 2 investigated how the two attachment dimensions relate to retrospective reports of trait tendencies in transportation. How might these dimensions relate to becoming transported into new narratives upon first encounter? A series of regressions was employed in order to answer this question with respect to overall state transportation, as well as each of its four aspects: Narrative Understanding, Attentional Focus, Narrative Presence, and Emotional Engagement.

Adult attachment and state transportation

The associations between attachment and state transportation across both films[8] were first explored through zero-order correlations. We found that state transportation was negatively related to attachment avoidance and unrelated to attachment anxiety. These results are in contrast to trait transportation in Study 1, which was unrelated to attachment avoidance and positively related to anxiety.

We next investigated whether each of the two attachment dimensions was uniquely associated with state transportation and its four facets. In each of the analyses that follow (Tables 5–9), centered aggregate anxiety and avoidance scores were entered in the first block; their interaction was entered in the second block, and all control variables were entered into the third block (as in the analyses performed for Studies 1 and 2).

8. In order to test whether the association between narrative engagement and the two attachment dimensions generalizes across the two different films, we first examined the interaction between film type and anxiety, and between film type and avoidance in a series of multiple regression analyses. In each of these analyses, the aggregate anxiety and avoidance scores were centered and entered into the first block. A centered film type term was also included in this block. Three two-way interaction terms (Anxiety × Avoidance, Anxiety × Film Type, Avoidance × Film Type) were entered in the second block, and a three-way interaction term (Anxiety × Avoidance × Film Type) was entered in the third block. None of the interactions were statistically significant ($ps > .23$), leading us to conclude that our results generalize across the two films used in our study. Therefore, the results presented in Study 3 collapse across both films.

Our first analysis revealed that the interaction between anxiety and avoidance was a unique predictor of overall state transportation (Table 5; Figure 1c). Specifically, it appears that although anxiety and state transportation were unrelated at low levels of avoidance (25th percentile), $b = -0.00$, $t(216) = -0.01$, $p = .94$, the two were positively associated at high levels of avoidance (75th percentile), $b = 0.21$, $t(216) = 2.14$, $p = .03$. Thus, the results from Studies 2 and 3 converge to suggest that at both the trait and state levels, the relation between transportation and attachment anxiety is moderated by attachment avoidance. (This same moderation was also observed in Study 1 but fell above threshold for statistical significance after controlling for Big Five traits.)

We subsequently examined how anxiety and avoidance relate to each of the four aspects of state transportation in order to better understand this difference in association. Although neither attachment dimension nor their interaction was related to Narrative Understanding or Attentional Focus (Tables 6 and 7), a divergent pattern of associations did emerge for the remaining two aspects of state transportation. Specifically, attachment anxiety was a positive predictor of Narrative Presence (the sense of being within the narrative; Table 8), whereas attachment avoidance was unrelated to this outcome. In all cases, these associations persisted after controlling for the relevant Big Five traits (i.e., Extraversion, Agreeableness, Conscientiousness, and Neuroticism).

Interestingly, for the emotional engagement facet of transportation, an interaction between anxiety and avoidance again emerged as a unique predictor (Table 9; Figure 1d). Probing this interaction revealed that although anxiety

Table 5. *Study 3: Examining the effects of attachment anxiety, avoidance, and their interaction on overall state transportation, controlling for Extraversion, Agreeableness, Conscientiousness, and Neuroticism*

	Variable	*B*	*SE*	β	*t*
Model 1	Anxiety	0.02	0.06	0.02	0.26
$R^2 = .02$	Avoidance	−0.17	0.08	−0.15	−2.13*
$F(2, 229) = 2.36$					
Model 2					
$R^2 = .02$	Anxiety	0.02	0.06	0.02	0.28
$F(3, 228) = 1.57$	Avoidance	−0.17	0.08	−0.15	−2.10*
Model 3	Anxiety × Avoidance	0.01	0.08	0.01	0.15
$R^2 = .15$	Anxiety	0.11	0.08	0.12	1.38
$F(15, 216) = 2.62$*	Avoidance	0.00	0.09	0.00	−0.05
	Anxiety × Avoidance	0.21	0.10	0.17	1.99*
	Extraversion	0.18	0.10	0.14	1.90
	Agreeableness	0.22	0.11	0.14	1.94*
	Conscientiousness	0.13	0.10	0.10	1.31
	Neuroticism	−0.11	0.10	−0.09	−1.12
	Anxiety × Neuroticism	0.13	0.10	0.10	1.35
	Anxiety × Agreeableness	−0.14	0.11	−0.10	−1.34
	Anxiety × Extraversion	0.00	0.10	0.00	0.01
	Anxiety × Conscientiousness	−0.01	0.09	−0.01	−0.12
	Avoidance × Conscientiousness	0.03	0.12	0.02	0.28
	Avoidance × Neuroticism	−0.13	0.13	−0.08	−1.00
	Avoidance × Agreeableness	0.21	0.13	0.13	1.59
	Avoidance × Extraversion	0.32	0.11	0.22	2.82*

*$p \leq .05$.

Table 6. *Study 3: Examining the effects of attachment anxiety, avoidance, and their interaction on narrative understanding, controlling for Extraversion, Agreeableness, Conscientiousness, and Neuroticism*

	Variable	*B*	*SE*	β	*t*
Model 1	Anxiety	−0.12	0.10	−0.09	−1.22
$R^2 = .01$	Avoidance	−0.08	0.13	−0.04	−0.64
$F(2, 229) = 1.32$					
Model 2	Anxiety	−0.11	0.10	−0.08	−1.09
$R^2 = .02$	Avoidance	−0.07	0.13	−0.04	−0.53
$F(3, 228) = 1.16$	Anxiety × Avoidance	0.12	0.13	0.06	0.92
Model 3	Anxiety	−0.06	0.13	−0.04	−0.46
$R^2 = .06$	Avoidance	−0.08	0.16	−0.04	−0.49
$F(15, 216) = .84$	Anxiety × Avoidance	0.24	0.18	0.13	1.37
	Extraversion	0.24	0.17	0.11	1.42
	Agreeableness	−0.26	0.19	−0.11	−1.39
	Conscientiousness	0.03	0.16	0.01	0.17
	Neuroticism	−0.16	0.17	−0.08	−0.99
	Anxiety × Neuroticism	0.12	0.17	0.06	0.74
	Anxiety × Agreeableness	0.11	0.18	0.05	0.59
	Anxiety × Extraversion	−0.01	0.17	0.00	−0.04
	Anxiety × Conscientiousness	−0.15	0.16	−0.07	−0.92
	Avoidance × Conscientiousness	0.19	0.21	0.07	0.94
	Avoidance × Neuroticism	0.26	0.22	0.11	1.20
	Avoidance × Agreeableness	0.35	0.23	0.13	1.54
	Avoidance × Extraversion	0.04	0.19	0.02	0.20

*$p \leq .05$.

and emotional engagement were unrelated at low levels of avoidance (25th percentile), $b = 0.15$, $t(216) = 1.20$, $p = .23$, the two were positively associated at high levels of avoidance (75th percentile), $b = 0.51$, $t(216) = 3.85$, $p < .001$. This interaction therefore parallels what is observed with respect to overall state transportation (and trait transportation in Study 2): The relation between attachment anxiety and emotional engagement was found to be moderated by attachment avoidance.

By examining the facets of transportation in the context of transportation into specific films, we were able to uncover a better understanding of how attachment relates to narrative engagement. Specifically, attachment anxiety predicts more transportation in the form of feeling "as if" one is in the story world itself, as well as being more emotionally impacted by the narrative, with the latter only being the case at high levels of attachment avoidance.

General Discussion

People's attachment orientations affect how strongly they bond with fictional characters (Cohen, 2004; Cole & Leets, 1999; Greenwood, 2008; Greenwood & Long, 2011; Greenwood et al., 2008), but can they also influence how deeply engrossed individuals become in fictional worlds? In this article, we built on previous research into how attachment anxiety and attachment avoidance relate to narrative transportation (Greenwood, 2008). Consistent with past research, Study 1 found that attachment anxiety, but not attachment avoidance, predicts a greater general tendency to become transported into narratives. Extending this past work, we found that this association was not accounted for by broad personality traits related to attachment. This is important as it demonstrates that the association between attachment anxiety and trait

Table 7. *Study 3: Examining the effects of attachment anxiety, avoidance, and their interaction on attentional focus, controlling for Extraversion, Agreeableness, Conscientiousness, and Neuroticism.*

	Variable	*B*	*SE*	β	*t*
Model 1	Anxiety	−0.28	0.10	−0.19	−2.83*
$R^2 = .06$	Avoidance	−0.19	0.13	−0.10	−1.49
$F(2, 229) = 7.09$*					
Model 2	Anxiety	−0.28	0.10	−0.19	−2.78*
$R^2 = .06$	Avoidance	−0.19	0.13	−0.10	−1.46
$F(3, 228) = 4.71$*	Anxiety × Avoidance	0.02	0.13	0.01	0.13
Model 3	Anxiety	−0.17	0.12	−0.11	−1.35
$R^2 = .15$	Avoidance	0.02	0.15	0.01	0.11
$F(15, 216) = 2.54$*	Anxiety × Avoidance	0.25	0.17	0.13	1.47
	Extraversion	0.19	0.16	0.09	1.19
	Agreeableness	0.33	0.18	0.13	1.81
	Conscientiousness	0.05	0.16	0.02	0.30
	Neuroticism	−0.18	0.16	−0.09	−1.15
	Anxiety × Neuroticism	0.17	0.16	0.08	1.07
	Anxiety × Agreeableness	−0.08	0.17	−0.03	−0.46
	Anxiety × Extraversion	0.06	0.16	0.03	0.41
	Anxiety × Conscientiousness	0.13	0.15	0.07	0.88
	Avoidance × Conscientiousness	−0.14	0.19	−0.05	−0.72
	Avoidance × Neuroticism	−0.16	0.20	−0.07	−0.78
	Avoidance × Agreeableness	0.07	0.22	0.03	0.34
	Avoidance × Extraversion	0.53	0.18	0.23	2.89*

*$p \leq .05$.

transportation is unique to relationship anxiety, rather than a general tendency to worry. Interestingly, a slightly more complex pattern of results emerged when transportation was measured in Studies 2 and 3. In both these studies, attachment anxiety still predicted a greater tendency to become absorbed into the narrative but only at high levels of attachment avoidance. In other words, we found that the relation between attachment anxiety and narrative transportation is moderated by attachment avoidance. Looking back at Study 1, a similar interaction between attachment anxiety and avoidance was also observed, but it was no longer statistically significant after controlling for personality. Examining the interaction plots from all three studies more closely (Figure 1), the pattern of results observed across these studies is rather consistent. Therefore, it appears that the same effect is captured across the three studies but that the size of this effect is smaller in Study 1 compared to Studies 2 and 3.

One possibility for why this interaction effect failed to reach statistical significance in Study 1 might be because the measure of transportation employed is not sensitive enough to capture the interaction effect between anxiety and avoidance. If this interaction pertains more specifically to the emotional engagement dimension of transportation, as appears to be the case in Study 3 (Figure 1d), only two of the seven items in the measure that was employed in Study 1 deal explicitly with emotions. Another possibility is that this interactive effect is more pronounced with respect to visual narratives (Studies 2 and 3) and so was not detected in Study 1 when the measure asked about various narrative modalities. These possibilities should be explored in future research.

Our research demonstrates the advantages of using a multidimensional model of narrative

Table 8. *Study 3: Examining the effects of attachment anxiety, avoidance, and their interaction on narrative presence, controlling for Extraversion, Agreeableness, Conscientiousness, and Neuroticism*

	Variable	*B*	*SE*	β	*t*
Model 1	Anxiety	0.26	0.10	0.17	2.49*
$R^2 = .03$	Avoidance	−0.09	0.14	−0.05	−0.69
$F(2, 229) = 3.11$*					
Model 2	Anxiety	0.25	0.11	0.16	2.35*
$R^2 = .03$	Avoidance	−0.11	0.14	−0.06	−0.79
$F(3, 228) = 2.35$	Anxiety × Avoidance	−0.12	0.13	−0.06	−0.92
Model 3	Anxiety	0.31	0.13	0.20	2.39*
$R^2 = .13$	Avoidance	0.12	0.16	0.06	0.74
$F(15, 216) = 2.17$*	Anxiety × Avoidance	−0.02	0.18	−0.01	−0.12
	Extraversion	0.22	0.17	0.10	1.31
	Agreeableness	0.34	0.19	0.13	1.79
	Conscientiousness	0.23	0.16	0.10	1.41
	Neuroticism	−0.03	0.17	−0.02	−0.20
	Anxiety × Neuroticism	0.23	0.17	0.11	1.38
	Anxiety × Agreeableness	−0.35	0.18	−0.15	−1.94
	Anxiety × Extraversion	−0.09	0.17	−0.04	−0.53
	Anxiety × Conscientiousness	0.04	0.16	0.02	0.22
	Avoidance × Conscientiousness	−0.20	0.21	−0.07	−0.95
	Avoidance × Neuroticism	−0.12	0.22	−0.05	−0.54
	Avoidance × Agreeableness	0.45	0.23	0.16	1.96*
	Avoidance × Extraversion	0.36	0.19	0.15	1.83

*$p \leq .05$.

transportation to gain a better understanding of how attachment relates to narrative engagement. In Study 3, overall state transportation was predicted by an interaction between attachment anxiety and avoidance, such that individuals who were high in both anxiety and avoidance were the most engaged with the film they watched. We further deconstructed this association by probing the various aspects of narrative engagement: (a) Narrative Understanding, (b) Attentional Focus, (c) Narrative Presence, and (d) Emotional Engagement. Neither attachment dimension was related to understanding or paying attention to the films, which is somewhat surprising in light of previous research. It has previously been shown that avoidantly attached individuals divert their attention away from attachment-related content, with the opposite being true for anxiously attached individuals (Edelstein & Gillath, 2008). The remaining two aspects of narrative transportation did show an association with the attachment dimensions. Specifically, attachment anxiety, but not avoidance, predicted feeling present in the narrative world created by the film. In addition, those who were more anxiously attached reported feeling more sympathy for the characters in the film and that the story affected them emotionally but only when they were also high in attachment avoidance. This suggests that the moderating effect of avoidance on anxiety observed with respect to overall transportation may largely be a function of emotional engagement. In other words, individuals who were high in both anxiety and avoidance were particularly emotionally affected by the narrative, which likely contributed to more overall transportation into the film.

These studies also highlight the importance of measuring transportation, in terms of both retrospective tendencies and state

Table 9. *Study 3: Examining the effects of attachment anxiety, avoidance, and their interaction on emotional engagement, controlling for Extraversion, Agreeableness, Conscientiousness, and Neuroticism*

	Variable	*B*	*SE*	β	*t*
Model 1	Anxiety	0.21	0.09	0.16	2.40*
$R^2 = .05$	Avoidance	−0.32	0.11	−0.19	−2.86*
$F(2, 229) = 5.35$*					
Model 2	Anxiety	0.21	0.09	0.17	2.42*
$R^2 = .05$	Avoidance	−0.32	0.11	−0.19	−2.79*
$F(3, 228) = 3.59$*	Anxiety × Avoidance	0.04	0.11	0.02	0.33
Model 3	Anxiety	0.33	0.10	0.26	3.20*
$R^2 = .19$	Avoidance	−0.07	0.13	−0.04	−0.57
$F(15, 216) = 3.36$*	Anxiety × Avoidance	0.36	0.14	0.21	2.50*
	Extraversion	0.10	0.13	0.06	0.77
	Agreeableness	0.46	0.15	0.22	3.04*
	Conscientiousness	0.19	0.13	0.10	1.46
	Neuroticism	−0.05	0.13	−0.03	−0.39
	Anxiety × Neuroticism	0.01	0.13	0.00	0.04
	Anxiety × Agreeableness	−0.25	0.15	−0.12	−1.68
	Anxiety × Extraversion	0.04	0.13	0.02	0.27
	Anxiety × Conscientiousness	−0.07	0.13	−0.04	−0.50
	Avoidance × Conscientiousness	0.28	0.16	0.12	1.69
	Avoidance × Neuroticism	−0.48	0.17	−0.23	−2.79*
	Avoidance × Agreeableness	−0.03	0.18	−0.01	−0.14
	Avoidance × Extraversion	0.35	0.16	0.18	2.25*

*$p \leq .05$.

transportation into a specific narrative example. Although a similar pattern of results emerged with respect to how attachment relates to trait and state transportation in Studies 2 and 3, there is an important point of distinction that is worth noting.[5] Specifically, in Study 2, we demonstrated that the interaction between anxiety and avoidance was a unique predictor of trait transportation before and after controlling for Extraversion, Agreeableness, Conscientiousness, and Neuroticism. In other words, the relation between attachment and trait transportation cannot be explained by these general traits. However, in Study 3, the interaction between anxiety and avoidance became a unique predictor of state transportation only after controlling for Extraversion, Agreeableness, Conscientiousness, and Neuroticism. This suggests that the relation between attachment and transportation may be more complex at the state level. Specifically, the aforementioned broad personality traits appear to be suppressing the effect of attachment on state transportation (e.g., Paulhus, Robins, Trzesniewski, & Tracy, 2004). In other words, it is only after removing the shared variance between attachment and these four personality traits that we were able to observe the unique effect of attachment on state transportation.

One possibility is that viewer response to a specific narrative is influenced by a greater number of factors compared to general transportation tendencies to self-selected narratives. This can contribute to greater error variance in our reduced predictive model containing only attachment anxiety, attachment avoidance, and their interaction term. Some of this error variance may be attributed to the entertainment genre preferences related to Big Five traits (Rentfrow, Goldberg, & Zilca, 2011), so accounting for these traits can improve

predictive ability and help uncover the unique associations between attachment and state transportation. That said, this is necessarily conjecture, and more work is needed to better understand the mechanism behind this suppression effect.

Why do individuals who are high on both attachment anxiety and avoidance become the most transported into narratives? One potential explanation is that these people find the social nature of fictional narratives especially appealing and engaging. These individuals desire social contact but avoid close relationships due to fear of rejection fueled by mistrust of others (Bartholomew & Horowitz, 1991; Henderson et al., 2005). They experience a poor quality of close relationships (Bartholomew & Horowitz, 1991) and, of all the attachment patterns, are the least content with their social support (Bartholomew, Cobb, & Poole, 1997). Fictional narratives with characters that can provide exposure to relationship content without the risk of rejection or judgment may therefore be especially appealing to this group. In contrast, those who are high in attachment anxiety and low in attachment avoidance may have more opportunities to fulfill their strong belongingness needs through actual relationships. Unfortunately, for those high in both anxiety and avoidance, a real-world relationship is an avenue to need satisfaction that is relatively more difficult to achieve. Although these individuals desire social connections, actual intimacy is likely to trigger avoidant defenses. Narratives may therefore offer a safe social experience for individuals high on both anxiety and avoidance. Future work should examine the potential benefits these individuals may experience through narrative engagement. For example, could repeated exposure to fictional narratives fulfill these individuals' belongingness needs or change their attitudes about relationships? Additionally, in light of these results, researchers should pay close attention to the interaction between anxiety and avoidance when examining other forms of social surrogacy.

The results from the present research could be used to inform potential interventions for insecurely attached individuals. For example, Mikulincer and Shaver (2007b) have suggested that interventions that can boost attachment security may be particularly beneficial for one's mental health and interpersonal relationships. A simulation-based intervention may be especially effective for individuals who are high in both anxiety and avoidance given these individuals' high tendency to become transported. Specifically, it seems reasonable that greater immersion in a simulation would strengthen the impact and efficacy of such interventions.

Fictional narratives are one type of simulation-based intervention that is frequently used in the context of health behavior (e.g., Kreuter et al., 2010; Williams, Green, Kohler, Allison, & Houston, 2011). Narratives can act as a social simulation that can enable people to gain access to a wider range of social experiences than they might encounter in their own lives (Gerrig, 1993; Mar & Oatley, 2008; Oatley, 1994, 1999). With respect to insecurely attached individuals, fictional narratives could serve to change people's attitudes about relationships by exposing them to positive relationship models in which both partners are supportive and responsive. If it is the case that reading or watching fictional narratives elicits social simulations, then greater engagement during this experience might enhance the degree to which individuals simulate and learn from the story world. Consistent with this idea, there is growing evidence that readers who are absorbed in a story are more likely to shift their attitudes and beliefs to be consistent with those beliefs embedded in the story (explicitly or implicitly), relative to those who are less absorbed (e.g., Appel & Richter, 2010; Green & Brock, 2000; Vaughn, Hesse, Petkova, & Trudeau, 2009).

Gillath, McCall, Shaver, and Blascovich (2008) have also suggested that immersive virtual environment technology could be used for therapeutic purposes. Interestingly, research has already shown that attachment processes can be observed in immersive virtual environments (Kane, McCall, Collins, & Blascovich, 2012; Schönbrodt & Asendorpf, 2012). Not only do people's attachment styles affect how they behave toward virtual spouses (Schönbrodt & Asendorpf, 2012), but the behavior of virtual partners has also been

shown to influence people's own attachment behavior (Kane et al., 2012). Specifically, participants who crossed a virtual cliff in the presence of a supportive and attentive virtual partner rated the task as being less stressful than those who crossed the cliff alone or in the presence of an unsupportive and inattentive virtual partner. Moreover, having a responsive virtual partner inspired feelings consistent with attachment security (e.g., feeling safe, secure, understood, etc.), whereas having an unresponsive virtual partner elicited behaviors consistent with attachment insecurity (e.g., being more vigilant while crossing the cliff, keeping more physical distance from their partner). Although further research is necessary to examine the extent to which virtual interactions can boost attachment security, these findings do suggest that simulations that allow people to interact with responsive and attentive social targets could have benefits for insecurely attached individuals, at least temporarily.

It is important to note that our studies were not without limitations. For example, all three studies relied on samples consisting solely of university students, and therefore, these results may not generalize to other populations. In addition, because only two films were used in Study 3, there is a possibility that our results do not generalize beyond these two narratives. Moreover, the film stimuli were both relationship focused, raising the possibility that our results do not apply to transportation into narratives per se but are rather limited to transportation into media portrayals of intimacy. That being said, narratives are typically centered on people and their relationships, with stories that do not contain these elements being quite rare (Hogan, 2009). Future work should examine whether our findings replicate across different types of content (e.g., relational vs. nonrelational), modalities (e.g., print), and genres (e.g., romance, science fiction). Another limitation is that we cannot be certain of the mechanism behind the associations we have uncovered. Although we successfully identified emotional engagement as the aspect of transportation driving our effects, our study was exploratory in nature, and it was not possible to formally examine emotion as the driving causal mechanism based on our study design. Future studies could extend this work by examining potential mediators at the individual level (e.g., need for affect, need to belong), as well as the narrative level (e.g., high vs. low relational content, high vs. low emotional content), within the context of an experimental design.

It is also important to point out that the effect sizes we observed could be seen as relatively small. To put them into context, the average effect size for social psychology has been estimated to be equivalent to an r of .21 ($SD = .15$, $Mdn = .18$; Richard, Bond, & Stokes-Zoota, 2003), with the average effect size for personality psychology quite similar ($r = .24$, $SD = .17$, $Mdn = .21$; Fraley & Marks, 2007). In Model 2 of our regressions (including the two attachment dimensions and their interaction, but excluding the Big Five traits), the variance accounted for is equivalent to r values of .20 (Study 1), .28 (Study 2), and .14 (Study 3). Hemphill (2003) found that the middle third of all effect sizes in research range from .20 to .30. The effects we report therefore fall within this middle third of what tends to be reported for Studies 1 and 2, with the effect for Study 3 being somewhat smaller. Although small, the effect for Study 3 is not far from the median effect observed in social psychology and within 1 *SD* of the mean effect size for both social and personality psychology. Moreover, although our effects range from small to average, one cannot infer the practical significance of an effect based on its magnitude (Fraley & Marks, 2007; Meyer et al., 2001). Even small effects can be important when predicting meaningful outcomes (and large effects can be unimportant depending on the context and outcome). In light of the importance that intimate social relationships have for our well-being, we would argue that the effects reported should be of broad interest.

These studies contribute to a growing body of work on the association between attachment orientation and the use of social surrogates. Specifically, we present evidence that insecurely attached individuals become more invested in narratives, which may potentially lead to greater character realism and parasocial bonding, resulting in increased benefits offered by these social surrogates. However, further

research is needed to examine to what extent engagement with narratives can fulfill the relational needs of insecurely attached individuals and what the outcomes of this engagement might be.

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