

ATTACHMENT-RELATED DIFFERENCES IN TRANSFERENCE ACROSS THE
LIFESPAN

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ABSTRACT

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Previous research examining transference – which posits we draw on our past experiences with close others to inform novel interactions – has found that people attribute qualities to and express preferences to interact with novel targets based on their similarity to significant others. However, less is known about how transference differs across the lifespan and how it applies to dating contexts. The current study ($N = 541$, $M_{\text{age}} = 34.73$, $SD = 9.78$; 61.4% Men, 63% White) tested whether transference replicated with an automated, online version of a transference task. We also tested whether participants found targets that resembled significant others (i.e., parents, ex-partners) to be preferable to control targets, and whether these effects were moderated by age and attachment orientation. Indeed, the effect of transference replicated in the online task: participants misattributed characteristics to and expressed greater preference for targets that resembled significant others relative to control targets. Younger and older adults engaged in transference in the same way; however, the effect was stronger in older adults. Individual differences in attachment avoidance and anxiety moderated transference processes and preference. Implications and future directions for transference are discussed.

This thesis is dedicated to Mom.
Thank you for your unconditional love and unwavering support.

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Introduction

When we meet someone new who reminds us of past significant others, we tend to prefer to interact with these individuals over those who do not remind us of past significant others. In other words, we often prefer new individuals who are similar to past significant others (Brumbaugh & Fraley, 2007). This imposition of traits from a past significant other onto a new person is known as *transference*. Transference is a cognitive process through which mental representations of significant others provide information that is used to navigate new social interactions (Andersen & Cole, 1990; Brumbaugh & Fraley, 2006). Transference is understood as a process existing within a social-cognitive framework: we hold memories of a lot of significant others, like our dating partners and parents. These memories create a large amount of information about what makes these people stand out. We can use transference to study how similarities in our past romantic partners and parents manifest in our choices of new partners. However, the extent to which transference processes are consistent across the lifespan and differ by attachment orientation is currently unknown. Some of the ignorance about lifespan transference processes originate from there being no formal paradigm that can be easily adapted and administered to people from different age groups. In the current study, I tested the transference hypothesis (i.e., do we erroneously remember details about a target on the basis of their similarity to significant others? And do we prefer people who resemble past significant others?) across the adult lifespan and examined attachment-related differences in this process.

Transference

There are three main assumptions underlying transference. First, we assume that transference occurs in our everyday social interactions (Sullivan, 1953). At its core, transference provides a means to navigate new social interactions and make inferences about people we meet.

Second, these mental representations are used to inform the impressions we make about new people (Andersen & Cole, 1990). Third, mental representations are chronically accessible to us (Andersen, Glassman, Chen, & Cole, 1995). The preponderance of theorizing about transference suggests that we draw on past experiences with significant others because they are most relevant for interacting in new relationships. But first, these mental representations need to be activated, and the utility of their activation needs to be clarified. How might these significant other representations become activated, and when are they useful?

As people go through life, they form important relationships. This often begins with parents, then friends and romantic relationships. The experiences and time that is shared with these people are stored as mental representations (Andersen & Cole, 1990; Fraley & Shaver, 1998; Hazan & Shaver, 1987; Hazan & Shaver, 1994). Mental representations of these relationships are created so that our memories and interactions with these individuals (and how these components influence us) can be preserved when these individuals are not physically near us. These mental representations are stored as working models that exist like other associative networks (Andersen et al., 1995; Hazan & Shaver, 1994; Higgins, 1989). Our mental representations exist as idiosyncratic social categories that can be drawn upon when we encounter new, sometimes ambiguous, social situations that require our prior knowledge to help us make sense of the new situation (Andersen & Cole, 1990; Higgins, 1996). In the absence of any information about a new person, we draw on our mental representations about close relationships. Fundamentally, this process can occasionally lead an individual to think that a novel encounter might resemble something or someone from their previous experiences, more so than might be appropriate (Andersen & Baum, 1994; Andersen et al., 1995). In other words, the inferences we make about a new person are derived from information from our past and are not

new information (because we have never interacted with this new person; Glassman & Andersen, 1999). Nevertheless, our prior experiences guide our new interactions.

This process primarily stipulates that, when representations are accessible and applicable, they will become activated. For example, Andersen et al. (1995) investigated the extent that the accessibility of close-other representations guides future interactions. In this study, participants generated descriptions of a significant other and non-significant other. In a second part of the study, they viewed four target persons. One target always resembled the participant's significant other. The other three targets were control targets. After reading about each target, participants were given a memory task—they were asked to rate how confident they were that a sentence (e.g., “Chris loves to read mystery novels.”) had appeared in each description. Participants remembered the target that resembled their significant other more often than the control targets.

Importantly, to the extent that a representation is chronically accessible and applicable to a new person, an inference will be made that may or may not appropriately reflect the features of a new person. That is, when the resemblance of the new person and the significant other representation are high, we treat this individual as we would that significant other, filling in gaps with the knowledge we already have (e.g., Andersen & Baum, 1994). The way we fill in gaps about a new person is our general assumption about how they will act based on what we know from our past experiences with the significant other they resemble. Our expectations are molded based on the accessibility and applicability of our representation. We also fill in gaps for how we responded to the significant other's behavior in the past. Specifically, we act similarly towards the target because they partially serve as a proxy on which we project the representation's characteristics (Andersen, Reznik, & Manzella, 1996; Berenson & Andersen, 2006). Ultimately, transference allows us to “go beyond the information given” in a new situation and make

inferences about people we do not know well on the basis that they resemble someone we do know well (Bruner, 1957).

Experimental Evidence of Transference

Transference-like processes have been demonstrated in a number of studies. The basic paradigm requires participants to first write descriptive statements about a significant other. This is meant to bring to mind the representations of significant others. Participants are also asked to categorize a series of adjectives that are (a) good, (b) poor, and (c) irrelevant for describing that significant other. Next, under the guise that a second study is unrelated, participants are brought back into the lab (often a few weeks after the aforementioned descriptive session) to read descriptions of novel targets that are generated using information from the aforementioned task (i.e., using the descriptions and adjectives they provided) a few weeks ago. These targets are designed to resemble either the participant's significant other or a control target, who does not resemble the significant other.

Much of the empirical work on transference has focused on understanding how inferences and affective responses to the novel target are influenced by significant other representations. Earlier work demonstrates a “classic” transference effect: a greater number of false memories for details that were not included in a novel description but that were present in descriptions of their significant others (e.g., Andersen & Baum, 1994; Andersen et al., 1995). In other words, people erroneously recall the presence of details that were not present in the description (but nevertheless describe their significant other as they go beyond the information provided).

Previous work has also found that the evaluations of a target that resembles a significant other were consistent in the emotions that they evoked. In other words, when a target resembled

a positively valenced significant other, they liked this target more than a control target; when a target resembled a negatively valenced significant other, they disliked this target more than a control target (Andersen et al., 1996). This effect is even found in the type of facial expressions made by participants when reading a description; affect is positive when the significant other target is positive, negative when the significant other target is negative, and there is no effect with control targets (Andersen et al., 1996). Behavioral confirmations of transference have also been found. In Berk and Andersen (2000), when engaged in conversations with a target that resembled a significant other, participants were judged as displaying more positive behavior toward the positively valenced target and more negative behavior toward the negatively valenced target (as assessed via tone of voice and emotional expressions). This literature demonstrates that evaluations of the target, affect, and behavior transfer when a target resembles a significant other.

Transference and its Association with Individual Differences in Attachment Orientation, Different Significant Others, and Age

Individual differences in attachment orientation. Attachment theory posits that a close bond with a caregiver is crucial to lifespan development, and individual differences in the propensity to form and maintain bonds and relationships is operationalized as an individual's attachment-related anxiety and avoidance (Bowlby, 1969/1982; Chopik, Edelstein, & Fraley, 2013; Mikulincer & Shaver, 2007). People higher in anxiety are concerned with abandonment and maintaining proximity to close others (Mikulincer & Florian, 1998). People higher in avoidance dismiss intimacy with close others and are less likely to seek support during stressful periods (Brennan, Clark, & Shaver, 1998).

Brumbaugh and Fraley (2006) examined the transference of significant others' qualities

and the attachment orientations of targets who resemble ex-partners. Specifically, this study examined how both global attachment (i.e., broadly how people experience attachment in close relationships) and relationship-specific attachment (i.e., attachment orientation to one person, their most significant ex-partner) were related to the relationship-specific attachment toward each novel target (novel targets that resembled the ex-partner and a control target). They found evidence for the classic transference effect: people erroneously recalled more details about the ex-partner target than the control target (i.e., people “filled in the blanks” by ascribing characteristics to new targets as though they were past significant others). Worth noting, attachment orientation did not moderate this classic transference effect in this particular study. They also found that a participant’s relationship-specific attachment orientation toward ex-partners (i.e., their general experiences of avoidance and anxiety with the specific ex-partner they reported on) was related to the relationship-specific attachment to the novel target that resembled that ex-partner. Specifically, participants exhibited more attachment-related anxiety or avoidance toward a target that resembled a significant other toward whom they also felt anxious or avoidant, respectively.

Whether or not anxious or avoidant people engage in transference to a greater degree was only tested once, in a narrow context—it did not moderate the effect of transference in one study (Brumbaugh & Fraley, 2006) and it has never been examined as a predictor of whether transference leads to a greater desire to affiliate with novel targets who resemble significant others. Other studies have examined attachment-relevant constructs (e.g., rejection expectancy; Berenson & Andersen, 2006), but these constructs were examined as separate dependent variables that could transfer to novel targets, not as moderators or predictors of the transference process. Yet other studies measured global attachment but did not examine it as a predictor of

transference-induced desire to affiliate (Brumbaugh & Fraley, 2007).

Individuals' attachment orientation transfers to novel people who resemble their significant others, on average. However, people differ in their global levels of attachment avoidance and anxiety, and these individual differences might affect transference processes, especially with respect to how it affects their preference for targets who resemble past significant others. However, it remains unclear how attachment orientation might affect evaluations and preference for targets who resemble significant others. We know that working models of significant others are made up of peoples' attachment experiences with those close others. Transference posits that people rely on information about close others and erroneously apply it to novel people who resemble them. Individuals who fixate on details of past relationships (i.e., anxious individuals; Mikulincer & Florian, 1998) might apply more details about their significant others to novel targets—because this information is more accessible. Avoidant individuals who make chronic attempts to disengage the attachment system (Brennan et al., 1998) may be less likely to apply details from past significant others as they try to lower the accessibility of this information (Fraley & Shaver, 1997). In other words, the tendency to fixate on or suppress information about a significant other might affect the accessibility of that information. If people differ in how accessible the information is, their global level of attachment avoidance or anxiety might disrupt the transference process. Said another way, transference relies on an individual's knowledge of close others and their ability to recall it when relevant stimuli (a significant other target) is present. Anxious people, who fixate on information, may over-apply details to anyone who is a potential dating partner, whereas avoidant people, who suppress information, may not find any past significant other particularly salient.

Different significant others. Past research has also examined if transference occurs

when novel targets resemble parents instead of ex-partners. In a study of women with a history of child abuse victimization, Berenson and Andersen (2006) examined if the effect of transference emerged among targets resembling parents compared to control targets. Regardless of abuse history, participants erroneously remembered more details about the parent target compared to the control target. This study demonstrated the effect of transference for parent targets.

Likewise, Brumbaugh and Fraley (2007) extended this work by examining if mental representations transferred to a different context—the tendency to select friends. In other words, do we use our representations of our parents to guide how we evaluate new friends? Or do we mostly rely on previous romantic partners to guide how we evaluate new friends? In general, results differed between ex-partners and parents, suggesting that indeed, ex-partners guide transference processes more than parents. People erroneously remembered more details about the target resembling the ex-partner than the control target (classic transference effect) but did not remember more about the target resembling the parent versus the control target. People also tended to transfer their feelings of anxiety and avoidance toward past significant others toward these new friend targets—feeling similarly anxious and avoidant toward these novel people that they don't have a history with. There is some evidence that this is especially true with respect to the attachment of parents, such that people might draw more on parental relationships when evaluating friends. In general, participants were more drawn to interacting with the target who resembled an ex-partner compared to the target who resembled their parent and the control target.

Why do these results differ, and why do targets who resemble parents or ex-partners differ in their ability to bring about transference? In Brumbaugh and Fraley (2007), targets were

described differently: ex-partner targets were portrayed as fellow students, while parent targets were members of the local community. This distinction could have created differences in how participants conceived of friendship and wanting to affiliate with those targets—perhaps student participants would want to interact with student targets instead of community members. The ambiguity of the effect of a parent-type target might also partially arise from the fact that previous research has relied exclusively on college-aged participants (Berenson & Andersen, 2006; Brumbaugh & Fraley, 2006; Brumbaugh & Fraley, 2007). In the transition to college, people naturally distance from parental figures and focus on other relationships, both romantic relationships and friendships (Arnett, 2000; Fraley & Davis, 1997) — this might explain why previous romantic relationships are more influential in guiding the formation of new relationships. Or it might reflect a design choice to portray these targets as community members. In the current study, we portrayed both ex-partner and parent targets as potential dating partners on equal footing (i.e., they did not differ on any superficial characteristic like past research).

These studies examined how both knowledge of an ex-partner and knowledge of a parent contribute to similarities in the evaluation and attachment style between significant others and novel people. People erroneously remember more and prefer targets who resemble these ex-partners. However, the effect of transference with targets resembling parents is less clear.

Transference across the lifespan. Some of the ambiguity about which significant others are most likely to facilitate transference (and whether or not we prefer targets who resemble significant others) can be solved by taking a broader lifespan approach. This would allow us to examine if people indeed rely on their mental representations of ex-partners or parents to select new relationship partners beyond the college years. Unfortunately, all of the studies on transference to date have been conducted on college students. Because we know that mate

preferences and relationships with significant others change over time, it is important that we look at the transference process across the lifespan (Arnett, 2000; Chopik, 2017; Chopik, Nuttall, & Oh, 2019; Fung, Carstensen, & Lutz, 1999; Luong, Charles, & Fingerman, 2011). One reason for these changes might be that our priorities regarding social relationships and well-being change across the lifespan. For example, our goals and priorities change as we age—often becoming more focused on the maintenance of emotional balance, positivity, and close, interpersonal relationships at the expense of more knowledge/status-related goals (Carstensen, Isaacowitz, & Charles, 1999). As people age, they have smaller, tighter social circles and seek higher quality relationships with others. Thus, the effect of transference might decline with age as mate selection criteria are based on different inputs (e.g., enhancing emotional balance; Tooby & Cosmides, 2005) than others (a reliance on working models of how our past relationships work).

Our preferences for certain traits and features in our relationship partners also change across the lifespan (Carstensen & Fredrickson, 1998; Fredrickson & Carstensen, 1990; Schwarz & Hassebrauck, 2012). This has important implications for transference processes. As people gain more life and relationship experiences, do they rely less on their experiences with their parents when engaging in transference as they gain more experience with romantic partners? If so, transference might only be present when new potential partners resemble past romantic partners (but not parents). Or do transference processes remain relatively constant, such that people seek out partners based on familiar qualities, regardless of how much new partners resemble ex-partners or parents? Do people also prefer dating partners who resemble familiar qualities in general or do they desire traits that resemble an ex-partner more? As of right now, it is practically impossible to test these questions using current paradigms for examining

transference.

Limitations and Necessary Directions for Transference

Currently, the empirical literature on transference is limited. Previous research has relied on college student samples. Because relational goals change across life, it is important that research examine how our mental representations guide partner selection across life. It is possible that mental representations do not (or dwindle in their influence to) guide our interactions with new partners later in life. It is also possible that, as individuals age and their significant other representations grow in number and distinctiveness, transference processes may become *stronger* as more knowledge is accumulated. Likewise, to date, the ability to test individual differences in transference processes has been limited by smaller sample sizes and the exclusive recruitment of college-aged participants. A robust test of transference examines if these processes look different in younger and older adults, with samples that have the statistical power necessary to detect these effects.

An additional limitation of this literature is the experimental transference paradigm itself. Practically speaking, it is difficult to reformulate descriptions based on recall tasks to create new study materials for a second session, as has been done in previous studies to date. It also involves a great deal of time and labor—target descriptions are constructed for each participant individually and participation takes place over two in-person sessions. That is why in-person sessions are spaced over multiple weeks—it affords researchers time to generate study materials, such as the target profiles. These restrictions impose a number of limitations for testing transference: researchers likely only test a small number of participants, data collection lasts an inordinate amount of time, and researchers may be more likely to rely on convenience samples (i.e., students) as a result. Automating the participant-generated and participant-selected portions

of the task—within a single session—would allow researchers to reach a broader, larger population in a relatively quick amount of time. In the current study, we attempted to employ a transference paradigm within one experimental setting.

The Present Research

The existing protocol for testing transference is effective in that previous research has been able to yield consistent results among college student samples. I was interested in examining if these effects (i.e., more false memories for a target that resembles an ex-partner or parent) would replicate in an online format. Additionally, I was interested in whether transference varied across age and attachment orientation. That is, if people use previous partners or parents as their template for selecting new partners, will they prefer people who resemble these significant others? Does it matter more if they resemble parents or ex-partners? Do they show this tendency across the entire adult lifespan? Further, do these processes differ by attachment anxiety and avoidance?

I had two primary hypotheses. First, I predicted that, using an online transference task, I would replicate previous transference findings. Participants who read target descriptions that resembled their ex-partner or parent would exhibit the “classic” false-positive memory effect – participants would erroneously remember and infer more about the target than what was actually presented to them.

Second, I predicted that targets that resemble significant others would be preferable to the control targets. Previously, ex-partner targets were viewed as more dateable compared to the control targets. People also preferred to have ex-partner targets as friends, but targets who resembled parents were not more likely to be desired as friends. If people indicate they prefer a target who resembles an ex-partner or a parent, this would be further evidence that people apply

their mental representations more broadly, preferring to date people with familiar traits. As it stands, I expected transference effects to be stronger for targets resembling ex-partners compared to targets resembling parents.

I treated tests of moderation by age as exploratory, which allowed me to test whether age differences in trait preferences and relational goals that occur with age might influence transference processes. Older adults have had more opportunities to create and maintain connections with significant others, so mental representations should be high in richness and distinctiveness as compared to younger adults. This would lead to the prediction that transference effects would be present, or even stronger, among older adults. However, trait preferences and relational goals change with age, perhaps making mental representations less relevant because new relationships are not sought out. This would lead to the prediction that transference effects would be present, or at least stronger, among younger adults. Because of these competing inferences, I did not make any formal predictions about the direction of potential age differences in transference.

Finally, I treated the tests of moderation by attachment anxiety and avoidance as exploratory. Examining attachment orientation as a moderator allowed me to test whether transference processes and preference for targets differed at different levels of attachment anxiety and avoidance.

Method

Participants

Participants were 733 individuals recruited from Amazon's Mechanical Turk. They received \$5.00 compensation for their participation in this study. Those who indicated English was not their first language, had no data past the demographics section, indicated they were not close with a parent and yet were placed in the parent condition¹, and those with an invalid age (people younger than 18 and older than 77) were excluded ($n = 192$).

These exclusions left us with a final sample of 541 participants.² Participants were 61.4% men³ and ranged in age from 19-77 ($M_{age} = 34.73$, $SD = 9.78$). The majority of participants were White (63%), 24.2% were Black or African American, 6.5% were Hispanic or Latino, 3.5% were Asian, .7% were American Indian or Alaskan Native, 1.8% were multiracial, and .2% identified as other. The majority of participants identified as straight (76%), 3.1% identified as gay/lesbian, 20.7% identified as bisexual, and .2% identified as queer. At the time of the survey, 64.1% of participants were currently married or in a long-term relationship, 12.9% were currently dating someone, and 22.9% were single. There were slightly more participants in the parent condition (58%) than in the ex-partner condition. Of those in the ex-condition, 59% of the exes were women. Of those in the parent condition, 67.1% were closest to their mothers.

¹ This is possible because participants were only eligible for the ex-partner condition if they indeed had an ex-partner. If they indicated they did not have an ex-partner, they were automatically placed in the parent condition (which explains why there were more participants in the parent condition overall). However, this funneling was true even if people also noted that they did not feel close to a parent as well. As a result, the participants who did not have an ex-partner and did not feel close to a parent were excluded.

² Some participants ($n = 49$) were suspicious of the manipulation (i.e., they suspected one of the targets was supposed to resemble their parent or ex, they were suspicious that the words they previously selected were in a target description, or they were suspicious of the significant other target in particular.) I re-ran these models on the full sample minus these 49 participants. Indeed, the effects were consistent with what is reported below. However, a two-way interaction, avoidance $\times$ condition (i.e., ex-partner v. parent) and a three-way interaction, anxiety $\times$ target $\times$ condition became non-significant.

³ Because of insufficient sample sizes for transgender men ($n = 1$) and transgender women ($n = 1$), they were recoded as men and women, respectively. Also because of insufficient sample size, ($n = 1$) a person who marked "other" for their gender was not included in the analysis.

Procedure

A transference study task was designed and administered online. As in previous studies, people began by being randomly assigned to provide open-ended descriptions about either the parent they felt the closest to (i.e., one condition) or their most significant ex-partner (i.e., the other condition). This exercise was meant to make the working models of these relationships accessible so that they could be further described. Participants then chose, out of a bank of 50 words, 15 adjectives that described their significant other well, 10 adjectives that described their significant other poorly, and 15 adjectives that were irrelevant descriptors of their significant other (see Appendix B for more details). The 15 good descriptor adjectives were then rank-ordered to convey which ones were most or least descriptive (this ranking later informed the automatic seeding of words into dating profiles). After a series of filler tasks that served as a distraction, participants rated five target descriptions that were members of a new online dating website. Four of these targets were generated and pre-tested by the study team to serve as control targets. A fifth target description was created using randomly interspersed adjectives that the participant had previously provided to describe their target well (adjectives ranked as moderately descriptive in the list [the adjectives ranked in the #6-10 spots], to reduce suspicion; see Andersen, Glassman, Chen, & Cole, 1995). The remainder of the description was filled in with random, irrelevant adjectives to reduce suspicion by making the piping of adjectives that they chose seem less obvious. The names of the targets were gender neutral (i.e., Sam, Alex, Morgan, Jordan, and Taylor [the transference target]) and the order of targets was randomized. Participants rated their preferences for interacting with each target (presented immediately after each description) as though they were members of the dating site. At the end of the study, participants completed the false memory task to assess transference. Suspicion was assessed with

two open-ended questions at the end of the study (Did you notice anything unusual about the study?, Did you notice anything unusual about the descriptions you read about Taylor, Morgan, Alex, Sam, or Jordan?).

Measures

Attachment orientation. Attachment orientation was measured using the 9-item version of Experiences in Close Relationships (Fraley, Heffernan, Vicary, & Brumbaugh, 2011).

Participants were asked to rate the extent to which they agreed with a number of statements on a scale from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). Items 1-6 tapped into avoidance and the first four were reverse coded ($M = 3.27$, $SD = 1.15$; $\alpha = .80$). Items 7-9 tapped into anxiety ($M = 3.85$, $SD = 1.98$, $\alpha = .95$). Items were mean-scored to create the anxious and avoidant attachment dimensions. Sample items assessing avoidance include “It helps to turn to people in times of need,” (reverse coded) and “I don’t feel comfortable opening up to others.” Sample items assessing anxiety include “I often worry that other people do not really care for me” and “I’m afraid people may abandon me.”

Preference. In line with past research (Brumbaugh & Fraley, 2006) participants were asked questions about how much they prefer each target. They were asked: “Based on what you just read, how much do you like (Taylor)?”, “How attractive do you find (Taylor)?”, and “How much would you like to date (Taylor)?” on a scale from 1 (*Not at all*) to 5 (*A great deal*). These three items were averaged to create the preference measure. Higher values indicated greater preference for a target. This question was repeated for the significant other target ($\alpha = .87$) and the control targets ($\alpha = .93$).

Transference task (i.e., false memory task). Participants were provided with 15 statements about each target that were either present or absent in the description they previously

read. In line with past research (Brumbaugh & Fraley, 2006; Brumbaugh & Fraley, 2007), participants were asked how certain they were that a particular sentence appeared in the target description on a scale from 1 (*Not at all certain*) to 4 (*Very certain*). For the transference target (i.e., the Taylor description), 8 of the 15 items presented contained adjectives that were previously selected but nevertheless did not appear in the description. Thus, participants who rated that they were certain that these 8 statements were present generated false memories about the description that resembled a significant other. A mean score of participant certainty that these 8 items appeared was calculated for the significant other target ($\alpha = .85$). A mean score of the same items (items that did not appear in the descriptions) was also taken for the other targets ($\alpha = .97$). Means, standard deviations, and reliability information for all study variables can be found in Table 1.

Analytic Strategy

Multilevel modeling was used to examine the extent to which age, condition (between subjects: ex-partner or parent), and target description (within subjects: target resembling a significant other versus 4 control targets) predicted transference (the certainty of false memory of characteristics of a novel target based on their resemblance to a closer other) and the preference for each target, controlling for gender and relationship status. Because men tend to express greater preferences for dating women than vice versa (Wood & Brumbaugh, 2009), I controlled for gender in all my analyses. Previous research has recruited only single people (e.g., Brumbaugh & Fraley, 2006). However, because our sample includes both single and partnered individuals, and because partnered people might be less motivated to seek out new relational partners (even in the context of hypothetical dating scenarios), I also controlled for relationship status in all my analyses.

To be clear, this “false memory” is demonstrated in certainty ratings for having seen a sentence that did not appear in the target description. Specifically, the extent to which participants indicate certainty that they had seen a sentence that did not appear in the target description is considered a false memory (i.e., transference; Andersen & Cole, 1990); higher certainty ratings indicate more transference. The preference for each target is straightforward; higher preference ratings indicate participants preferred the target more. I also tested the extent to which age and attachment orientation moderated the effects of transference and preference.

For both dependent variables (certainty ratings for target descriptions and preference for targets), a null model was first specified to assess the degree of nonindependence and calculate an intraclass correlation (ICC). The ICC for certainty ratings was .82 (Wald $Z = 15.73$; $p < .001$), and the ICC for preference was .47 (Wald $Z = 13.39$; $p < .001$). This suggested that in both cases, for certainty ratings and preference, ratings across targets were similar within participants and that this should be accounted for. Next, a model including all Level-1 predictors (targets; the within-subjects variable) was specified to determine the random structure. I specified an unstructured covariance structure, which allowed for the estimation of random intercepts, random slopes, and their covariance. I included random intercepts to test if participants differed in their mean levels of certainty. I included random slopes to see if participants differed in their effect of transference across target descriptions. I allowed random intercepts and slopes to covary to see if the effect of target (significant other or control) differed depending on participants’ mean level of certainty ratings. This model was also specified for preference. In the transference model, the variance of the intercept was $\sigma^2 = .42$, $p < .001$, the variance of the slope was $\sigma^2 = .02$, $p < .001$. In the preference model, the variance in the intercept was $\sigma^2 = .52$, $p < .001$, and the variance of the slope was $\sigma^2 = .07$, $p < .001$. The covariance between the intercepts and slopes

was negative for both certainty ratings (transference model), $\sigma^2 = -.03$, $p < .001$, and preference ratings (preference model), $\sigma^2 = -.11$, $p < .001$. This covariance became non-significant in the third model for transference (the model examining the moderating effect of attachment orientation on transference). This may indicate that participants who had higher certainty or preference ratings overall did not strongly distinguish between the targets (i.e., gave similarly high scores for all the targets). Alternatively, those who had lower certainty or preference ratings had a higher slope, indicating better ability to distinguish between the significant other target and the control targets. Running the first, second, and third models for certainty ratings without the random slope and covariance (i.e., only allowing for random intercepts using a variance components covariance structure) did not change the conclusions drawn from the models. Running the first, second, and third models for preference ratings without the random slope and covariance (i.e., only allowing for random intercepts using a variance components covariance structure) did not change the conclusions drawn from the models.

The final models test the main effects and interactions separately for age and attachment orientation (anxiety and avoidance), controlling for gender and relationship status. Thus, the first model examined the effect of target (significant other v. control), condition (parent v. ex-partner) and their interaction with transference, controlling for gender and relationship status. The purpose of this model was to establish the effect of transference. This model was also specified for preference. The second model tests the main effects of age, target, and condition on transference, with the two-way (e.g., age $\times$ target) and three-way interactions (e.g., age $\times$ target $\times$ condition) between age and the aforementioned variables added. The third model tests the main effects of attachment orientation, target, and condition on transference, with the two-way (e.g., anxiety $\times$ target) and three-way interactions (e.g., avoidance $\times$ target $\times$ condition) between

attachment orientation and the aforementioned variables added. The second and third models were repeated with the same specifications for preference. Significant two-way interactions were followed up with simple slopes analyses. The significant three-way interactions were followed up by creating dummy codes for condition and examining the continuous moderator at ± 1 standard deviation around the mean.

Results

Multilevel models of certainty and preference ratings nested within participants were used to examine if transference (i.e., the false memory of characteristics of a novel target based on their resemblance to a close other) and preference differed by age, attachment orientation, condition, and target, controlling for gender and relationships status. Age, attachment anxiety and avoidance were grand mean centered. Condition was coded such that the representation of an ex-partner was coded as 1; the representation of a parent was coded as -1. Target profile was coded such that the significant other target was coded as 1, and the other four control targets were -1. Gender was coded such that men were assigned 1 and women were assigned -1. Relationship status was coded such that single people were assigned 1 and people in relationships (dating, married, or in a long-term relationship) were assigned -1.

Descriptive statistics on all study variables can be found in Table 1. The certainty ratings (transference) and the preference ratings were highest for the significant other profile (I formally analyze and test this below). All certainty and preference ratings were significantly positively correlated with each other ($r_s = .38 - .83$; $p_s < .01$). Anxiety and avoidance were positively correlated ($r = .29$; $p < .01$). Anxiety was positively correlated with all certainty ratings ($r_s = .44 - .58$; $p_s < .01$) and preference ratings ($r_s = .18 - .60$; $p_s < .01$). Avoidance was significantly negatively correlated with the preference of the significant other target such that people low in avoidance preferred the significant other target more ($r = -.14$; $p < .01$). Age was significantly negatively correlated with certainty and preference ratings, such that younger adults had higher certainty ratings and preference ratings ($r_s = -.24 - .34$; $p_s < .01$).

Does the Transference Effect Replicate in an Online, Automated Setting?

Means and standard deviations of certainty ratings by condition, gender, and relationship

status are displayed in Table 2. Overall, people have higher certainty ratings for the significant other target compared to the control targets. Men tend to have higher ratings than women, and people in relationships tend to have higher ratings than single people.

The classic transference effect is demonstrated when, compared to control targets, people feel more certain that content which was previously generated by them appeared in the significant other target description when in fact it did not. As seen in Table 3, people were more certain (i.e., had more false memories) that they saw content that was not there for the significant other description compared to the control descriptions, controlling for gender and relationship status. There were main effects of gender and relationship status, however, such that men and people in relationships had higher certainty ratings. Further, it did not matter if significant other targets resembled their ex-partners or parents (i.e., the main effect of condition and the target $\times$ condition interaction were not significant); certainty ratings were higher for significant other targets compared to the control targets regardless of condition. This implies people falsely attribute characteristics of their significant others to novel people who resemble them. This effect is consistent with previous findings that use just targets resembling ex-partners (Brumbaugh & Fraley, 2006; Brumbaugh & Fraley, 2007) or just targets resembling parents (Berenson & Andersen, 2006), but not consistent with findings that have used targets resembling ex-partners and parents (Brumbaugh & Fraley, 2007)—we found that transference occurs with both ex-partner and parent targets.

Does Age Moderate Transference Processes?

Results from the model including age can be seen in Table 4. There was a significant main effect of age such that younger participants reported greater certainty ratings (although this neglects how these variables interact with the target descriptions). Age also moderated the effect

of target on certainty ratings. This two-way interaction is displayed in Figure 1. Older adults had higher certainty ratings for significant other targets compared to control targets ($\beta = .16, p < .001$). Younger adults had higher certainty ratings overall and had higher certainty ratings for significant other targets compared to control targets, although the effect was weaker ($\beta = .10, p < .001$). Both younger and older adults demonstrated transference – their ability to “go beyond the information given” (Bruner, 1957) only when it was relevant, although the effect was weaker with younger adults.

Does Attachment Moderate Transference Processes?

Results from the model including attachment anxiety and avoidance can be seen in Table 5. There were significant main effects of attachment anxiety and avoidance, such that those higher in attachment anxiety and those lower in attachment avoidance reported greater certainty ratings (although this neglects how these variables interact with the target descriptions).

Anxiety. Anxiety moderated the effect of target on certainty ratings. The effect of target is plotted for individuals low and high in anxiety (i.e., ± 1 standard deviation). As seen in Figure 2, individuals low in anxiety had higher certainty ratings when evaluating the significant other target versus control targets ($\beta = .21, p < .001$). Individuals high in anxiety reported higher certainty ratings overall, and also had higher certainty ratings when evaluating the significant other target versus the control targets, albeit the effect was weaker ($\beta = .06, p = .001$). Taken together, individuals low and high in anxiety demonstrate the effect of transference; however, those high in anxiety engaged in this process with a heightened fixation to details (they had higher certainty ratings overall) and were less discriminant among target descriptions (the slope was flatter than those low in anxiety). There was a three-way interaction between attachment anxiety, target, and condition. I followed up this three-way interaction by examining the effect of

target at low and high levels of anxiety by condition (ex-partner and parent). The anxiety $\times$ target interaction was significant for those in the ex-partner condition ($\beta = -.10, p < .001$) and for those in the parent condition ($\beta = -.05, p = .003$). As seen Figure 3, individuals in the ex-partner condition who were low in anxiety had higher certainty ratings for the significant other target versus the control targets ($\beta = .25, p < .001$). Individuals high in anxiety had similarly high certainty ratings across the significant other target and control targets ($\beta = .05, p = .061$). As seen in Figure 4, individuals in the parent condition showed very similar associations—those who were low in anxiety had higher certainty ratings for the significant other target versus the control targets ($\beta = .16, p < .001$). Individuals in the parent condition who were high in anxiety had higher certainty ratings overall and higher certainty ratings for the significant other target versus the control targets, although the effect was weaker ($\beta = .07, p = .002$). Taken together, individuals low in anxiety engaged in transference by applying more details to targets who resembled a significant other target than control targets in both the ex-partner and parent condition. Transference was disrupted for those high in anxiety in the ex-condition, such that they applied details across both the significant other and control targets. Transference was not disrupted for those high in anxiety in the parent condition – they applied details about their parent to targets who resembled them, although to a lesser extent than those low in anxiety in the same condition.

Avoidance. Avoidance moderated the effect of condition on certainty ratings. The effect of condition is plotted for those low and high in avoidance (i.e., ± 1 standard deviation). As seen in Figure 5, individuals low in avoidance had higher certainty ratings in the parent condition than those in the ex-partner condition ($\beta = -.09, p = .037$). Individuals high in avoidance in the parent condition had similar certainty ratings to those in the ex-partner condition ($\beta = .06, p = .227$).

This interaction suggests that certainty ratings were higher in the parent condition for those low in avoidance; however, this interaction neglects how these variables interact with the target descriptions.

There was a three-way interaction between attachment avoidance, target, and condition. I followed up this three-way interaction by examining the effect of target at low and high levels of avoidance by condition (ex-partner and parent). The avoidance $\times$ target interaction was not significant for those in the ex-partner condition ($\beta = .02, p = .166$) and is thus not displayed. However, as seen in Figure 6, the avoidance $\times$ target interaction was significant for those in the parent condition ($\beta = -.04, p = .016$). Individuals low in avoidance in the parent condition had higher certainty ratings overall, and had higher certainty ratings for the significant other target versus control targets ($\beta = .16, p < .001$). Individuals high in avoidance in the parent condition also had higher certainty ratings for the significant other target versus control targets, although the effect was weaker ($\beta = .07, p = .003$). Both those low and high in avoidance in the parent condition engaged in transference – they applied more details of their parents to targets who resembled them than control targets – though this occurred to a lesser extent for those who were high in avoidance.

Do People Prefer Significant Other Targets to Control Targets?

Means and standard deviations of preference ratings by condition, gender, and relationship status are displayed in Table 2. Overall, people have higher preference ratings for the significant other target compared to the control targets. Men tend to have higher ratings than women, and people in relationships tend to have higher ratings than single people.

Preference is demonstrated by the extent to which participants rated the target highly on a composite measure of preference (likeability, attraction, and dateability). Higher ratings suggest

that the target is preferable – with the hypothesis that significant other targets would be preferred over control targets. As seen in Table 6, people preferred the significant other target more than the control targets controlling for gender and relationship status. There were main effects of gender and relationship status, however, such that men and people in relationships had higher preference ratings. Further, this did not vary by condition, which suggests that significant other targets were preferable to control targets in both the ex-partner and parent condition.

Does Age Moderate Preferences for Transference Targets?

There was a significant main effect of age such that younger participants reported greater preference ratings, as seen in Table 7. Age further moderated the effect of target on preference ratings (i.e., two-way interaction) and the effect of target and condition on preference ratings (i.e., three-way interaction).

Age moderated the effect of target on preference ratings. The effect of target is plotted for individuals low and high in age (i.e., ± 1 standard deviation). As seen in Figure 7, younger individuals had greater preference for the targets overall and preferred the significant other target to control targets ($\beta = .22, p < .001$). Older adults also had greater preference for the significant other target versus control targets, and this effect was stronger ($\beta = .34, p < .001$). Taken together, this suggests that both younger and older adults preferred targets who resembled significant others to control targets, however there were important differences between these groups. Younger adults had higher preference ratings overall, while older adults had lower preference ratings, but had a greater degree of preference for the significant other target over control targets.

There was a three-way interaction between age, target, and condition. I followed up this three-way interaction by examining the effect of target at low and high levels of age by condition (ex-partner and parent). The age $\times$ target interaction was not significant for those in the ex-

partner condition ($\beta = .008, p = .785$) and is thus not displayed. However, as seen in Figure 8, the age $\times$ target interaction was significant for those in the parent condition ($\beta = .11, p = .001$). Younger adults in the parent condition preferred the significant other target over control targets ($\beta = .19, p < .001$). The same effect was observed for older adults – they also preferred the significant other target over control targets, but the effect was stronger ($\beta = .40, p < .001$). Both younger and older adults preferred targets who resembled significant others to control targets, but only for those in the parent condition. Younger adults had higher preference ratings overall for targets resembling a parent, while older adults had lower preference ratings, but had a greater degree of preference for the target resembling their parent over control targets.

Does Attachment Moderate Preferences for Transference Targets?

As seen in Table 8, there were significant main effects of attachment anxiety and avoidance. Those higher in anxiety and lower in avoidance reported higher preference ratings. However, these effects do not separate preference by the type of target (significant other versus control target).

Anxiety. Anxiety moderated the effect of target on preference. The effect of target is plotted for individuals low and high in anxiety (i.e., ± 1 standard deviation). As seen in Figure 9, individuals low in anxiety preferred the significant other target over control targets ($\beta = .44, p < .001$). Individuals high in anxiety reported higher preference overall and also preferred the significant other target over control targets; however, the effect was weaker ($\beta = .12, p < .001$). Both individuals low and high in anxiety preferred the significant other target to control targets; however, preference for targets resembling significant others was more pronounced with individuals who were less anxiously attached.

Avoidance. Avoidance moderated the effect of target on preference. The effect of target

is plotted for individuals low and high in avoidance (i.e., ± 1 standard deviation). As seen in Figure 10, individuals low in avoidance had higher preference ratings overall and preferred the significant other target over control targets ($\beta = .32, p < .001$). Individuals high in avoidance also preferred the significant other target over control targets, although the effect was weaker ($\beta = .24, p < .001$). Those low and high in avoidance preferred the significant other target to control targets; however, those low in avoidance had higher preference ratings overall and showed a greater degree of preference for the significant other target.

Discussion

The purpose of this study was to test if the effect of transference replicated within a modified online setting and across the lifespan. I was also interested in how these processes affected the preference for various targets. Finally, I was interested in how age, attachment orientation, and condition (ex-partner or parent) moderated the transference process and preference for various targets. Indeed, the effect of transference replicated — people erroneously recalled details having been part of the target description when evaluating targets that resembled significant others, and this did not differ by condition (ex-partner and parent). Participants preferred the significant other target over the control targets, and this also did not differ by condition. The effect of transference was present for younger and older adults, although this effect was stronger for older adults. Transference processes and preferences for significant other targets were more prominent in individuals low in anxiety and avoidance. These findings provide evidence that the transference effect is replicable, even in a modified, automated task, which allowed me to test a number of additional questions related to transference.

Transference Replicates in an Online, Automated Setting

Consistent with previous research, we found an effect of transference, such that people reported more certainty for erroneously remembering information related to a target resembling a significant other, when in fact, this information was generated by them earlier in the study to describe their significant other. Moreover, an effect of transference was observed for both those in the ex-partner condition *and* those in the parent condition suggesting that mental representations of both ex-partners and parents are drawn on in transference contexts. The effect of transference with targets resembling ex-partners and targets resembling parents is consistent with Brumbaugh and Fraley (2006) and Berenson and Andersen (2006), respectively; however,

Brumbaugh and Fraley (2007) did not find an effect of transference with targets resembling parents.

Why did consistent effects of transference emerge for both ex-partner and parent targets? This study included a larger sample than past work (Brumbaugh & Fraley, 2007), and perhaps examining this effect across the lifespan revealed more variation in the accessibility of significant others in one's working model. This further supports that mental representations of significant others remain relevant when meeting new people; significant others are accessible to the extent they share resemblance with the novel person and this is true whether it relates to parents or ex-partners.

An alternate explanation for consistent effects of transference among significant other targets might have to do with the degree of coherence among the descriptions of the significant other targets and control targets. When people evaluate trait descriptions, the extent to which the information is coherent (a person is described as kind and thoughtful [a consistent personality] instead of rude and thoughtful [an inconsistent personality]) affects how they encode that information (Burnstein & Schul, 1983). One difference between this study and past work on transference is the construction of control targets. Previously, control targets were yoked – one participant's significant other served as the control target for a different participant. In other words, previous studies used control targets constructed with traits that resembled a person a participant knew in real life. In this study, control profiles were not constructed to resemble anyone in particular, which may have reduced the coherence of the information when participants read about control targets. Although we generated control targets to have coherent descriptions, nevertheless this may have affected the manner in which people remembered information about targets – perhaps we observed this effect of transference because there was

some degree of coherence between the significant other target that was not present for the control targets.

Significant Other Targets were Preferred over Control Targets

Significant other targets were preferred over the control targets. This effect did not differ by condition; people found targets resembling ex-partners and parents similarly preferable. Because preference ratings did not differ by condition, perhaps the presence of familiar qualities make a target preferable over another that is not familiar. This is consistent with Brumbaugh & Fraley's (2006) findings that targets resembling ex-partners were more dateable than control targets. Although preference in a dating context has not been directly studied for targets that resemble parents, there is some evidence to suggest that familiar traits—like those we may have seen in our interactions with parents—may influence someone's attraction and preference for targets who match on those traits (see Andersen & Chen, 2002; Heffernan, Chong, & Fraley, 2018). Further, when it comes to actual similarities between people whom someone has dated, individuals' actual past and current partners are similar to each other, suggesting that we tend to seek out similar people over time and that, based on the current study, resemble significant others from our past (Park & MacDonald, 2019).

Age Moderated the Effect of Transference and Preference

Both younger and older adults engaged in transference – they applied details about their significant others to targets who resembled them. However, older adults demonstrated a slightly better ability to apply details to the significant other target. A similar pattern of effects emerged for preference. Both younger and older adults preferred the significant other target over the control targets; however, older adults preferred the significant other target to the control targets to a greater extent than younger adults. Further, a three-way interaction demonstrated this pattern

of preference for younger and older adults, but only for those in the parent condition. Why might we see this stronger effect in older adults? Significant other representations are chronically accessible to the extent that they are high in richness and distinctiveness (Andersen et al., 1995). By virtue of their age, older adults have had more opportunities to interact with significant others in memorable ways which might make them more chronically accessible. Why might only targets resembling parents be preferred over control targets? Overall, this finding was unexpected. There are a number of possibilities that might explain why this effect occurred. One reason might be that our relationships with our parents continue across life, whereas relationships with ex-partners do not. A second reason might be that as we get older, we start to prefer qualities that are more positive and stable (perhaps like that of our parents) rather than ex-partners who might not have great qualities (Carstensen et al., 1999; Fung et al., 1999).

Attachment Moderated the Effects of Transference and Preference

Anxiety moderated transference and preference. Individuals lower in attachment anxiety better distinguished between the significant other and control targets – they erroneously applied more significant other-relevant information and preferred targets who resembled their significant others. However, these processes were diminished among those high in anxiety. Why might transference processes be diminished in those who are higher in anxiety?

This process of “going beyond the information given” allows people to further speculate about what they have learned about a novel person and generate inferences that are relevant to stored information (Bruner, 1957; Mikulincer, Shaver, Sapir-Lavid, & Avihou-Kanza, 2009). Indeed, past research suggests securely attached individuals are more cognitively flexible and open to new information, and thus they may have an easier ability to draw on past experiences related to significant others (Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996; Mikulincer,

1998). Anxiously attached individuals have a strong desire to maintain close relationships, and as a result chronically seek out information to assess the state and quality of their relationship (Cassidy & Berlin, 1994; Chopik et al., 2013). Perhaps because anxiously attached people already are on “high alert” to look for cues on the status of their relationships, they draw more connections to incoming information, and are less distinguishing about whether characteristics resemble someone they already know. Further, because people who are high in anxiety are preoccupied with relationships, perhaps that is why they prefer significant other targets (Brumbaugh & Fraley, 2010). In other words, the constant vigilance and preoccupation with relationships might lead them to misapply across many situations and prefer those who are familiar.

Avoidance moderated transference and preference. People low and high in avoidance engaged in transference and preferred the significant other target over the control targets. However, this effect was stronger for those who were low in avoidance. The discrepancies in the strength of the effect at low and high levels of avoidance might be attributable to characteristics of avoidant attachment, particularly for those high in avoidance. Avoidant individuals suppress the attachment system, and instead prioritize autonomy and self-reliance over getting close to significant others (Brennan et al., 1998). This may lead avoidant individuals to gather less information about significant others, and thus this information is less accessible when new people resemble them. Because avoidant individuals are less likely to be in romantic relationships and are less likely to transition from casual relationships to committed relationships (Schindler, Fagundes, & Murdock, 2010), they may be more ambivalent about relying on their experiences of both ex-partners and parents in guiding their preference in novel dating scenarios (Chopik et al., 2014; Chopik et al., 2019).

Limitations and Future Directions

The current study had a number of strengths. I created a modified version of the transference task, which allowed transference to be tested in a straightforward way that saved time and energy on both the part of the experimenter and participant. Moving forward, this could galvanize researchers to study transference, and answer further questions about transference processes and the robustness of the theory. Further, using the modified transference task, I was able to examine preference and transference processes with two different significant others across the lifespan, unlike previous research that only examined college age participants, and only one significant other.

However, there are also a number of limitations that should be acknowledged. One limitation of this study is the number of significant others examined. I only examined two significant others: the most significant ex-partner and the parent one felt the closest to. A better test of transference would include examining if transference occurs when people draw on their working models across multiple people. In general, the process of examining multiple significant others of the same type (i.e., ex-partners or friends) would allow researchers to examine if people broadly select new close others who are similar to ones in their working models across the totality of their relationships. For example, people could examine transference processes with sequential ex-partners. This would allow future researchers to examine the accessibility of ex-partners and determine if more recent partners are more accessible than those farther in the past or whether the most significant, exemplary ex-partners hold the most sway. Moreover, examining multiple friends in a person's working model would allow future researchers to examine if people select new friends based on their similarity with existing (or past) friends and which friendships are the most accessible to individuals.

A second limitation of this study is the construction of target descriptions. Participants read dating profiles that only included a short paragraph of information. Certainly, when evaluating similarities between someone who resembles a significant other, there are other more relevant factors to take into account, like facial expressions, tone of voice, behavior, and physical appearance (e.g., Kraus & Chen, 2010).

A third limitation of this study is the reliance on self-reports when describing a significant other. Because the effect of transference is based on characteristics generated by the participant, we might observe transference simply because it is easier for people to remember descriptions they generated about people they know than descriptions generated by someone else about people they know. To that end, because these descriptions are self-reports of others, they might reflect information in a participant's working model, but they might not accurately reflect the descriptions that the ex-partner or parent might generate of themselves. In other words, it is possible that the information provided by the participants is inaccurate or a distortion of what their significant other is like. Future researchers might examine whether the observed effect of transference is based only on memory of self-reported descriptions of significant others or is also observed when the details about the significant other are more "accurate" and factual. Accuracy in significant other descriptions and their effect on transference might be addressed with a dyadic design where pairs of exes describe themselves and each other. Intriguingly, working models involve the subjective organization of imperfect information solely from the perspective of the individual themselves (Collins & Read, 1994; Fraley, 2007). Thus, it could be that an individual's perception of a significant other, regardless of whether this perception is rooted in reality, may be all that is necessary to facilitate transference. In future studies, novel targets could be created to resemble Person 1's description of themselves and Person 2, as well as

Person 2's description of themselves and Person 1, among other control targets. With this design, future researchers would be able to (1) examine how descriptions of an ex differ by source (participant or ex-partner), (2) the degree of transference between descriptions, and (3) the degree to which participants would find these two different significant other targets preferable over control targets.

Conclusions

This study is the first to test transference with a streamlined, automated task, beyond a college aged sample, with parents and ex-partners. Even with modifications to the original task, the classic transference effect was demonstrated; people reported more certainty for erroneously remembering information related to a target resembling a significant other in both the ex-partner and parent condition. Younger and older adults engaged in transference; however, the effect of transference was stronger in older adults. People also preferred the significant other target to the control targets in both the ex-partner and parent condition. Individual differences in attachment anxiety and avoidance emerged for both transference processes and preference. The current study provides further evidence that people apply their mental representations of significant others broadly during the process of learning about novel people, and these processes vary by age and attachment. Future research might examine transference with multiple or sequential partners, or ex-partner dyads to examine how transference processes differ with more attachment figures and multiple sources of information.

APPENDICES

APPENDIX A

Tables and Figures

Table 1.

Means, standard deviations (SD), and alpha reliability for study variables

	1	2	3	4	5	6	7	8	9
1. Anxiety									
2. Avoidance	0.29**								
3. Transference - SOT ^a	0.44**	-0.01							
4. Transference - CTs ^b	0.58**	0.05	0.83**						
5. Preference - SOT	0.18**	-0.14**	0.39**	0.38**					
6. Preference - CTs	0.60**	0.06	0.62**	0.75**	0.48**				
7. Age	-0.27**	-0.10*	-0.26**	-0.31**	-0.24**	-0.34**			
8. Gender	0.04	0.08	0.07	0.08	0.19**	0.17**	-0.21**		
9. Relationship Status	-0.05	0.10*	-0.23**	-0.27**	-0.12**	-0.20**	0.001	0.07	
<i>M</i>	3.85	3.27	2.57	2.38	3.40	2.76	34.73	-	-
<i>SD</i>	1.98	1.15	0.68	0.71	0.98	0.98	9.78	-	-
<i>α</i>	0.80	0.95	0.85	0.97	0.87	0.93	-	-	-

* $p < .05$, ** $p < .01$.^aSOT= Significant Other Target^bCTs = Control Targets

Table 2.

Cell means and standard deviations (SD) for model 1 for transference and preference

Ex-Partner Condition											
Men						Women					
Single			In a relationship			Single			In a relationship		
<i>Transference</i>	<i>Mean</i>	<i>SD</i>	<i>Transference</i>	<i>Mean</i>	<i>SD</i>	<i>Transference</i>	<i>Mean</i>	<i>SD</i>	<i>Transference</i>	<i>Mean</i>	<i>SD</i>
SO ^a Target	2.28	0.61	SO Target	2.72	0.70	SO Target	2.28	0.60	SO Target	2.49	0.73
Ctrl ^b Target	1.94	0.59	Ctrl Target	2.54	0.72	Ctrl Target	1.97	0.57	Ctrl Target	2.29	0.79
<i>Preference</i>	<i>Mean</i>	<i>SD</i>	<i>Preference</i>	<i>Mean</i>	<i>SD</i>	<i>Preference</i>	<i>Mean</i>	<i>SD</i>	<i>Preference</i>	<i>Mean</i>	<i>SD</i>
SO Target	3.44	1.04	SO Target	3.56	0.91	SO Target	2.67	1.18	SO Target	3.14	1.02
Ctrl Target	2.37	0.71	Ctrl Target	3.01	0.95	Ctrl Target	2.09	0.90	Ctrl Target	2.56	1.06
Parent Condition											
Men						Women					
Single			In a relationship			Single			In a relationship		
<i>Transference</i>	<i>Mean</i>	<i>SD</i>	<i>Transference</i>	<i>Mean</i>	<i>SD</i>	<i>Transference</i>	<i>Mean</i>	<i>SD</i>	<i>Transference</i>	<i>Mean</i>	<i>SD</i>
SO Target	2.28	0.62	SO Target	2.72	0.64	SO Target	2.28	0.57	SO Target	2.61	0.66
Ctrl Target	2.13	0.67	Ctrl Target	2.56	0.66	Ctrl Target	1.99	0.51	Ctrl Target	2.43	0.67
<i>Preference</i>	<i>Mean</i>	<i>SD</i>	<i>Preference</i>	<i>Mean</i>	<i>SD</i>	<i>Preference</i>	<i>Mean</i>	<i>SD</i>	<i>Preference</i>	<i>Mean</i>	<i>SD</i>
SO Target	3.40	0.96	SO Target	3.61	0.96	SO Target	2.76	0.92	SO Target	3.37	0.86
Ctrl Target	2.66	0.80	Ctrl Target	3.00	0.98	Ctrl Target	2.00	0.46	Ctrl Target	2.72	1.00

^aSO= Significant Other ^bCtrl = Control

Table 3.
Effect of target and condition on transference

	<i>b</i>	<i>SE</i>	β	<i>df</i>	<i>t</i>	<i>p</i>	95% Confidence Interval	
							Lower Bound	Upper Bound
Intercept	2.342	0.034		537.696	69.344	< 0.001	2.275	2.408
Target	0.098	0.009	0.132	539.000	11.070	< 0.001	0.081	0.115
Condition	-0.028	0.028	-0.037	536.993	-1.000	0.318	-0.082	0.027
Target $\times$ Condition	0.012	0.009	0.016	539.000	1.356	0.176	-0.005	0.029
Gender	0.067	0.028	0.091	537.000	2.390	0.017	0.012	0.123
Relationship Status	-0.208	0.033	-0.279	537.000	-6.353	< 0.001	-0.272	-0.144

Table 4.

Effect of target, condition, and age on transference

	<i>b</i>	<i>SE</i>	β	<i>df</i>	<i>t</i>	<i>p</i>	95% Confidence Interval	
							Lower Bound	Upper Bound
Intercept	2.348	0.033		535.217	71.239	< 0.001	2.284	2.413
Target	0.095	0.009	0.129	537.000	10.716	< 0.001	0.078	0.113
Condition	0.001	0.027	0.004	535.000	0.045	0.964	-0.052	0.054
Age	-0.020	0.003	-0.299	535.041	-7.094	< 0.001	-0.025	-0.014
Gender	0.027	0.028	0.036	535.000	0.977	0.329	-0.027	0.081
Relationship Status	-0.211	0.032	-0.284	535.000	-6.699	< 0.001	-0.273	-0.149
Target $\times$ Condition	0.009	0.009	0.012	537.000	0.975	0.330	-0.009	0.026
Age $\times$ Target	0.002	0.001	0.030	537.000	2.194	0.029	< 0.001	0.004
Age $\times$ Condition	0.004	0.003	0.054	535.011	1.316	0.189	-0.002	0.009
Age $\times$ Target $\times$ Condition	0.001	0.001	0.021	537.000	1.546	0.123	> -0.001	0.003

Table 5.
Effect of target, condition, and attachment orientation on transference

	<i>b</i>	<i>SE</i>	β	<i>df</i>	<i>t</i>	<i>p</i>	95% Confidence Interval	
							Lower Bound	Upper Bound
Intercept	2.349	0.028		526.742	82.984	< 0.001	2.293	2.404
Target	0.097	0.009	0.132	526.000	11.300	< 0.001	0.080	0.114
Condition	-0.017	0.023	-0.019	524.007	-0.712	0.477	-0.063	0.029
Anxiety	0.188	0.012	0.502	524.103	15.268	< 0.001	0.164	0.213
Avoidance	-0.067	0.021	-0.107	524.218	-3.150	0.002	-0.109	-0.025
Gender	0.065	0.024	0.088	523.999	2.752	0.006	0.019	0.112
Relationship Status	-0.180	0.027	-0.242	523.999	-6.576	< 0.001	-0.234	-0.126
Target × Condition	0.012	0.009	0.018	526.000	1.405	0.161	-0.005	0.029
Anxiety × Target	-0.028	0.005	-0.075	526.000	-6.228	< 0.001	-0.037	-0.019
Avoidance × Target	-0.005	0.008	-0.008	526.000	-0.686	0.493	-0.021	0.010
Anxiety × Condition	-0.002	0.012	-0.005	524.080	-0.161	0.872	-0.026	0.022
Avoidance × Condition	0.047	0.021	0.076	524.048	2.248	0.025	0.006	0.089
Anxiety × Target × Condition	-0.010	0.005	-0.028	526.000	-2.301	0.022	-0.019	-0.002
Avoidance × Target × Condition	0.021	0.008	0.033	526.000	2.679	0.008	0.006	0.036

Table 6.

Effect of target and condition on preference

	<i>b</i>	<i>SE</i>	β	<i>df</i>	<i>t</i>	<i>p</i>	95% Confidence Interval	
							Lower Bound	Upper Bound
Intercept	2.917	0.043		537.025	68.371	< 0.001	2.833	3.001
Target	0.321	0.022	0.275	539.000	14.687	< 0.001	0.278	0.364
Condition	-0.050	0.035	-0.043	537.000	-1.435	0.152	-0.119	0.019
Target $\times$ Condition	-0.005	0.022	-0.004	539.000	-0.215	0.830	-0.048	0.038
Gender	0.193	0.036	0.165	537.000	5.414	< 0.001	0.123	0.263
Relationship Status	-0.204	0.041	-0.175	537.000	-4.943	< 0.001	-0.286	-0.123

Table 7.

Effect of target, condition, and age on preference

	<i>b</i>	<i>SE</i>	β	<i>df</i>	<i>t</i>	<i>p</i>	95% Confidence Interval	
							Lower Bound	Upper Bound
Intercept	2.938	0.041		535.480	70.929	< 0.001	2.856	3.019
Target	0.328	0.022	0.282	537.000	14.934	< 0.001	0.285	0.371
Condition	-0.011	0.034	-0.010	534.990	-0.330	0.741	-0.078	0.055
Age	-0.026	0.004	-0.249	535.082	-7.405	< 0.001	-0.033	-0.019
Gender	0.137	0.035	0.117	535.000	3.939	< 0.001	0.069	0.205
Relationship Status	-0.203	0.040	-0.174	535.000	-5.121	< 0.001	-0.281	-0.125
Target $\times$ Condition	-0.013	0.022	-0.012	537.000	-0.571	0.569	-0.056	0.031
Age $\times$ Target	0.006	0.002	0.058	537.000	2.703	0.007	0.002	0.010
Age $\times$ Condition	-0.001	0.003	-0.005	535.015	-0.165	0.869	-0.007	0.006
Age $\times$ Target $\times$ Condition	-0.005	0.002	-0.050	537.000	-2.345	0.019	-0.010	-0.001

Table 8.

Effect of target, condition, and attachment orientation on preference

	<i>b</i>	<i>SE</i>	β	<i>df</i>	<i>t</i>	<i>p</i>	95% Confidence Interval	
							Lower Bound	Upper Bound
Intercept	2.933	0.037		535.780	78.562	< 0.001	2.859	3.006
Target	0.324	0.020	0.279	526.001	16.009	< 0.001	0.284	0.364
Condition	-0.034	0.031	-0.029	523.885	-1.101	0.271	-0.095	0.027
Anxiety	0.213	0.016	0.361	524.283	12.996	< 0.001	0.181	0.245
Avoidance	-0.133	0.028	-0.136	524.766	-4.732	< 0.001	-0.189	-0.078
Gender	0.184	0.031	0.158	524.001	5.992	< 0.001	0.124	0.245
Relationship Status	-0.169	0.036	-0.144	524.001	-4.740	< 0.001	-0.239	-0.099
Target $\times$ Condition	-0.008	0.020	-0.006	526.001	-0.379	0.705	-0.047	0.032
Anxiety $\times$ Target	-0.096	0.011	-0.162	526.001	-8.986	< 0.001	-0.116	-0.075
Avoidance $\times$ Target	-0.036	0.018	-0.037	526.001	-1.985	0.048	-0.072	> - 0.001
Anxiety $\times$ Condition	0.019	0.016	0.032	524.189	1.143	0.254	-0.013	0.051
Avoidance $\times$ Condition	0.028	0.028	0.028	524.057	0.989	0.323	-0.027	0.083
Anxiety $\times$ Target $\times$ Condition	< 0.001	0.011	< 0.001	526.001	0.021	0.983	-0.021	0.021
Avoidance $\times$ Target $\times$ Condition	0.004	0.018	0.004	526.001	0.227	0.820	-0.032	0.040

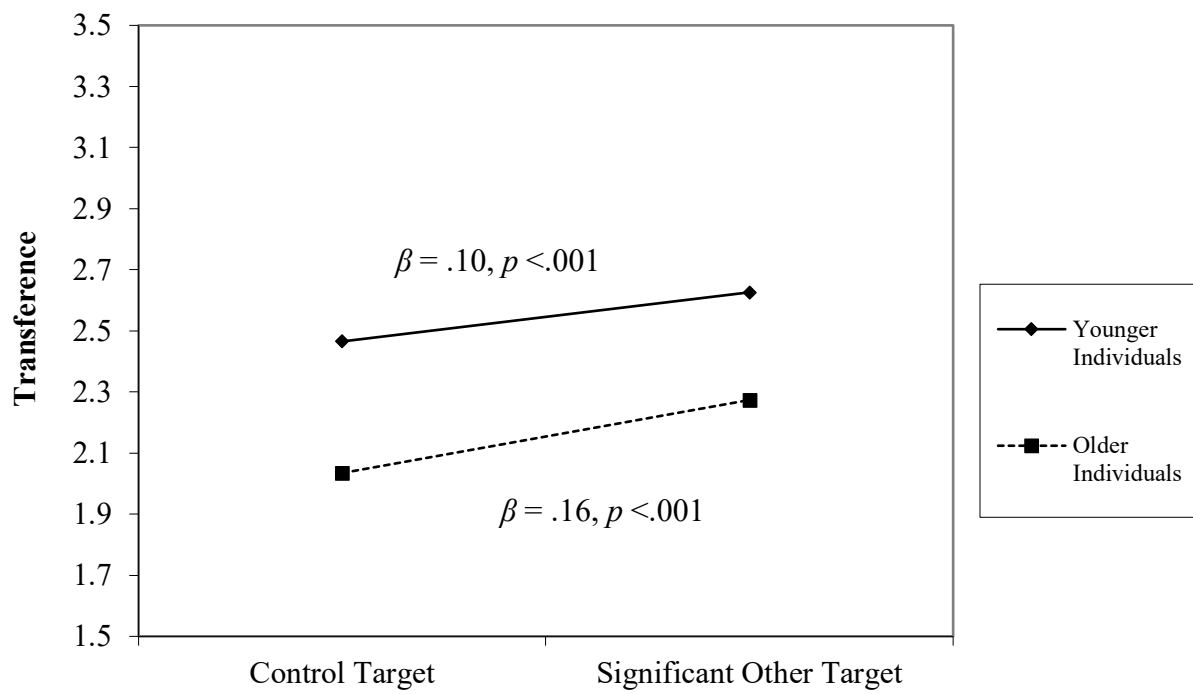


Figure 1. The effect of transference by target (Control Target v. Significant other Target) at low and high age.

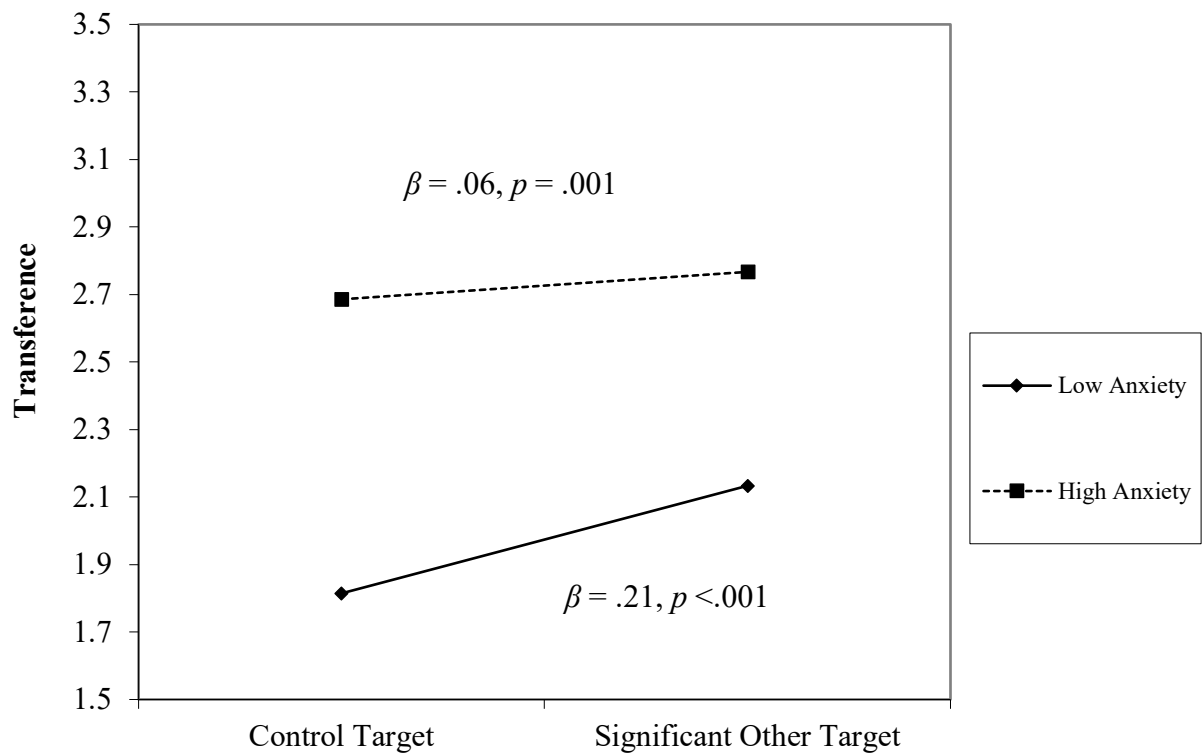


Figure 2. The effect of transference by target (Control Target v. Significant other Target) at low and high levels of anxiety.

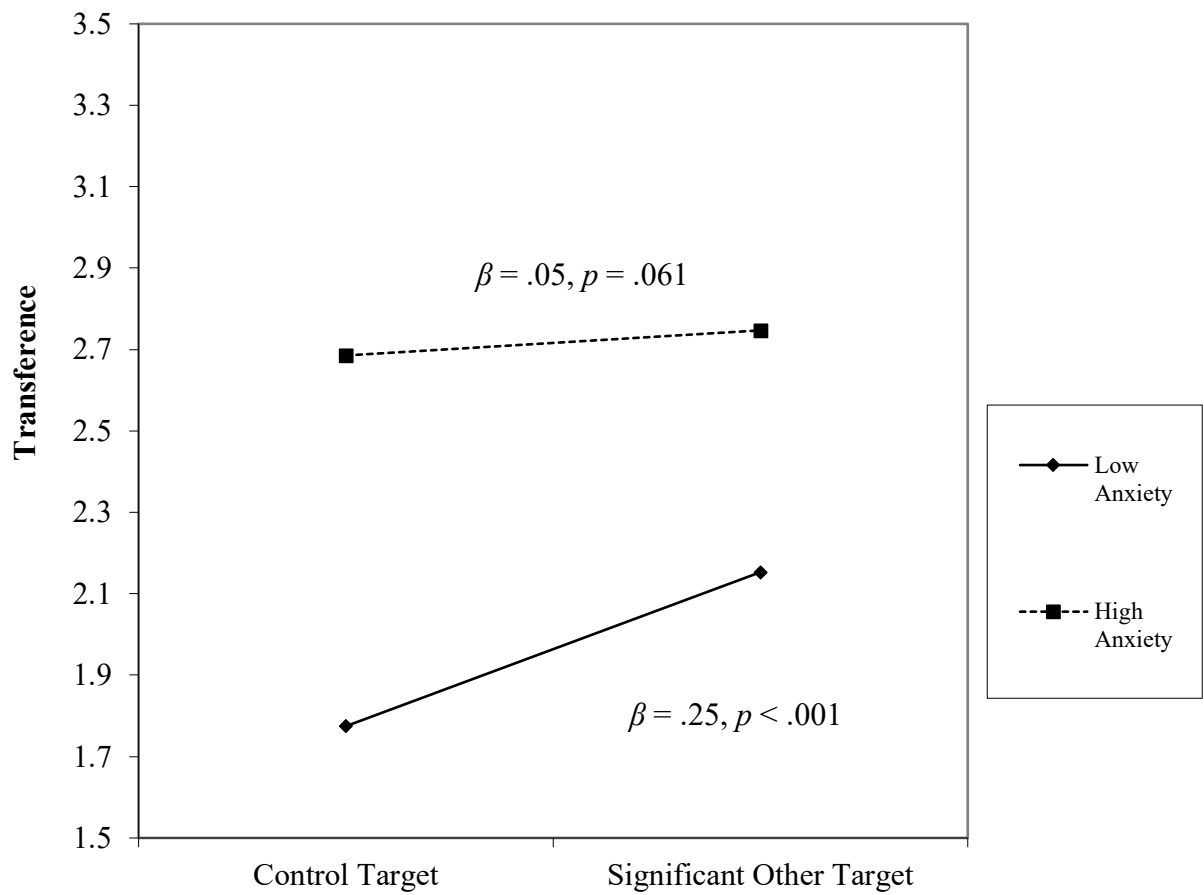


Figure 3. The effect of transference by target (Control Target v. Significant Other Target) at low and high anxiety in the ex-partner condition.

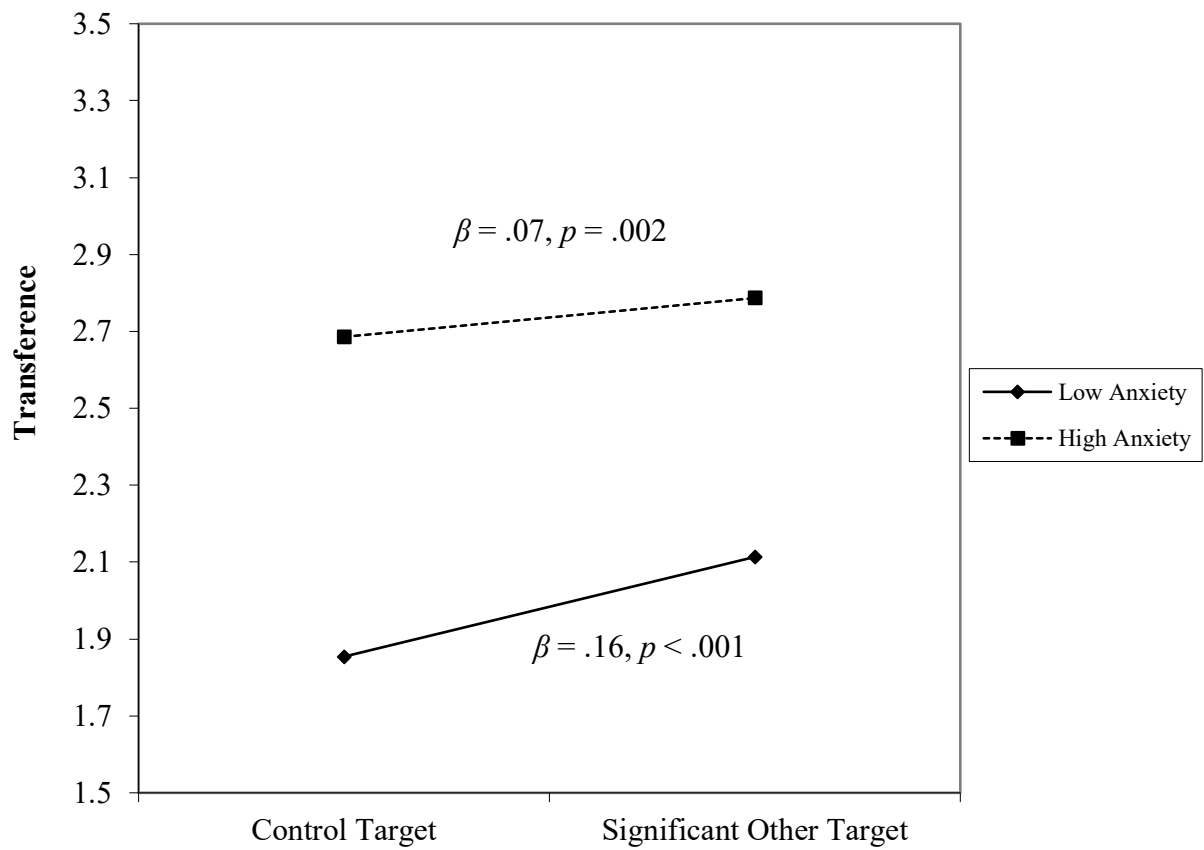


Figure 4. The effect of transference by target (Control Target v. Significant Other Target) at low and high anxiety in the parent condition.

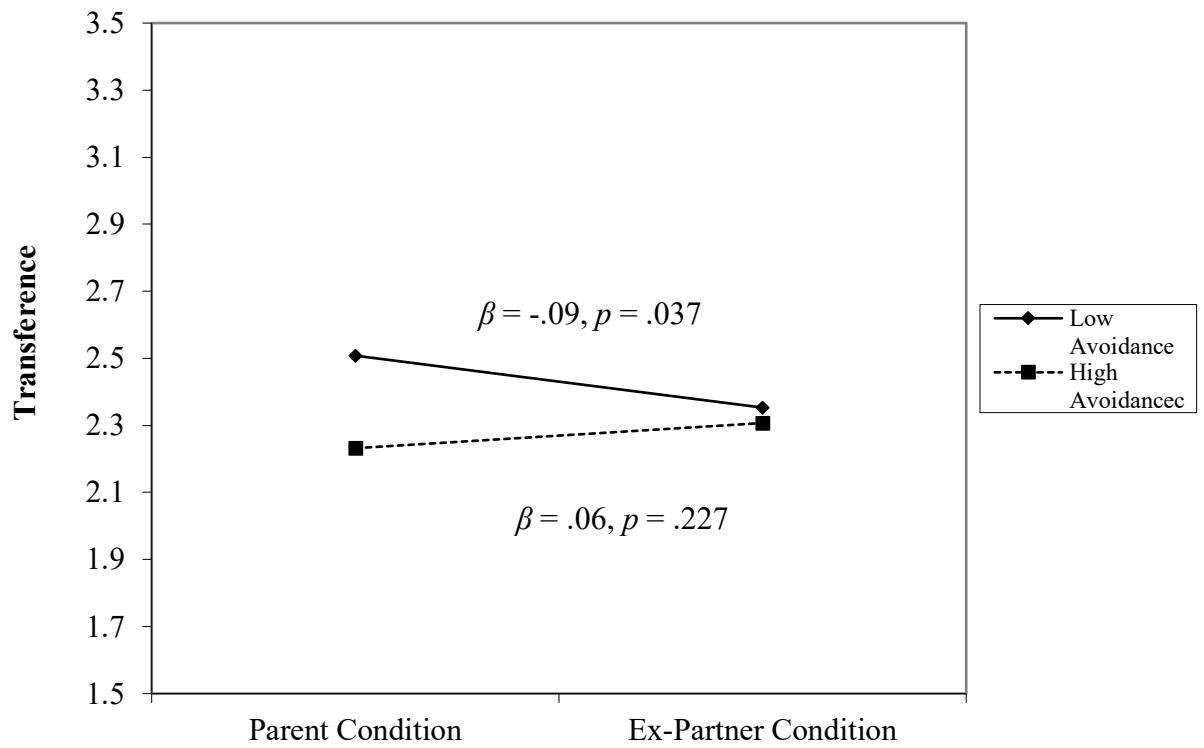


Figure 5. The effect of transference by condition (Parent Condition v. Ex-Partner Condition) at low and high avoidance.

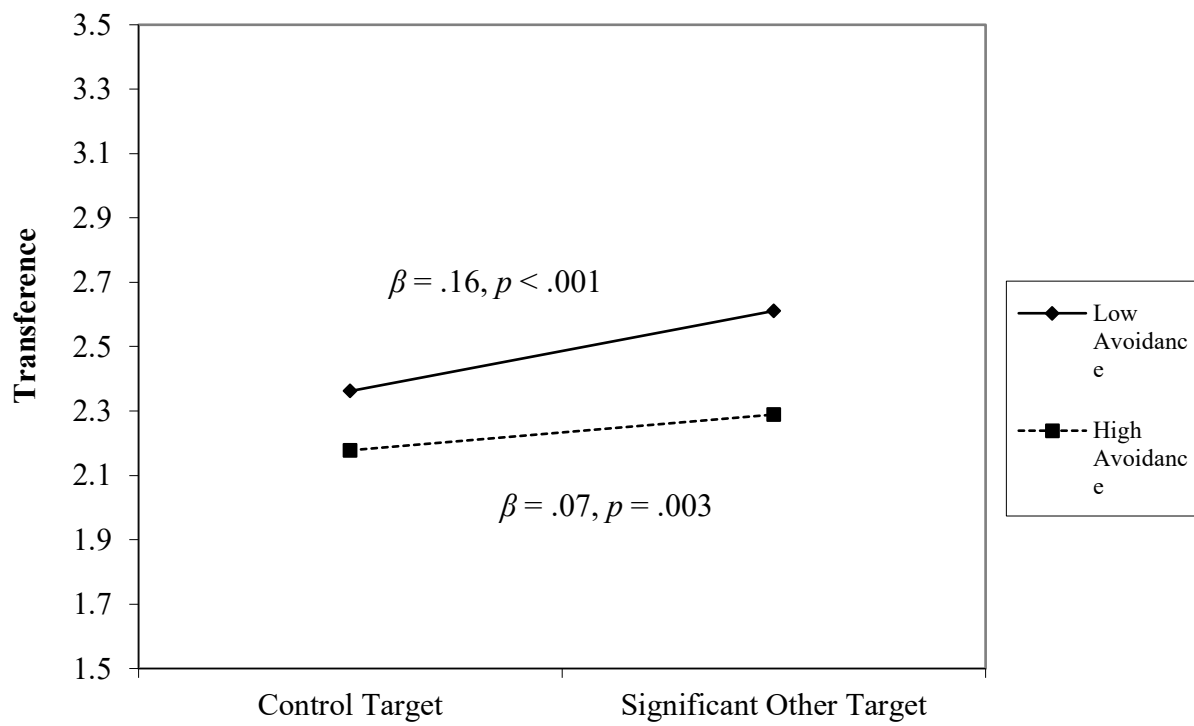


Figure 6. The effect of transference by target (Control Target v. Significant Other Target) at low and high avoidance in the parent condition.

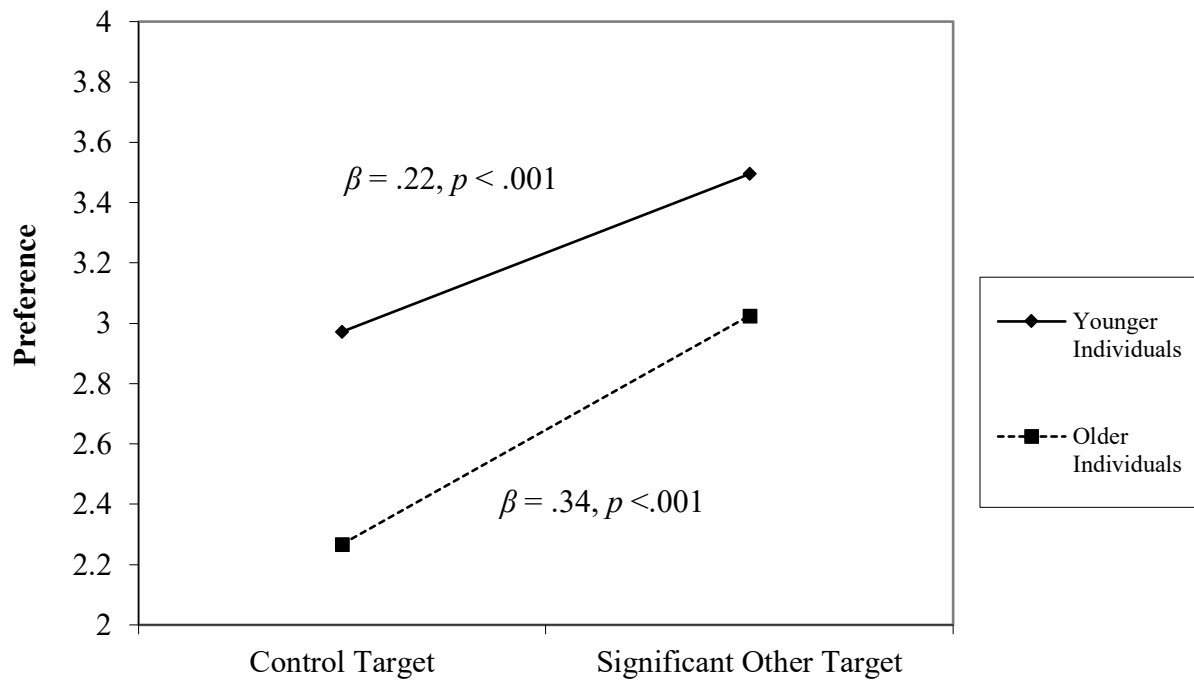


Figure 7. The effect of preference by target (Control Target v. Significant Other Target) at low and high age.

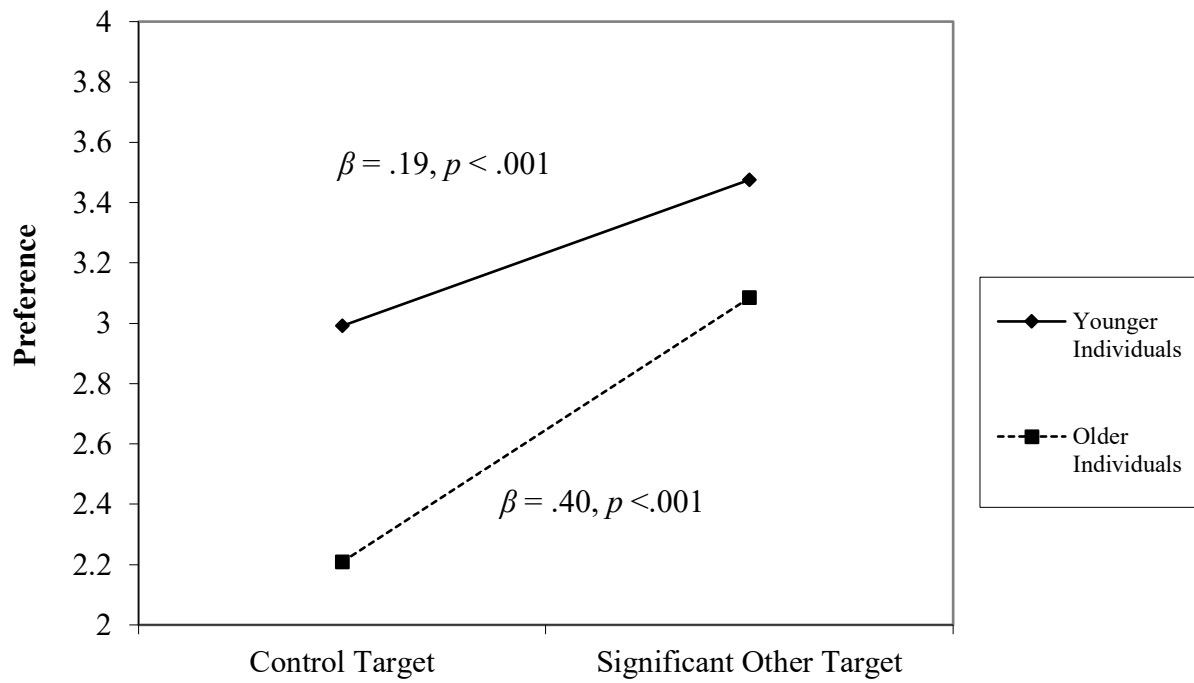


Figure 8. The effect of preference by target (Control Target v. Significant Other Target) at low and high age in the parent condition.

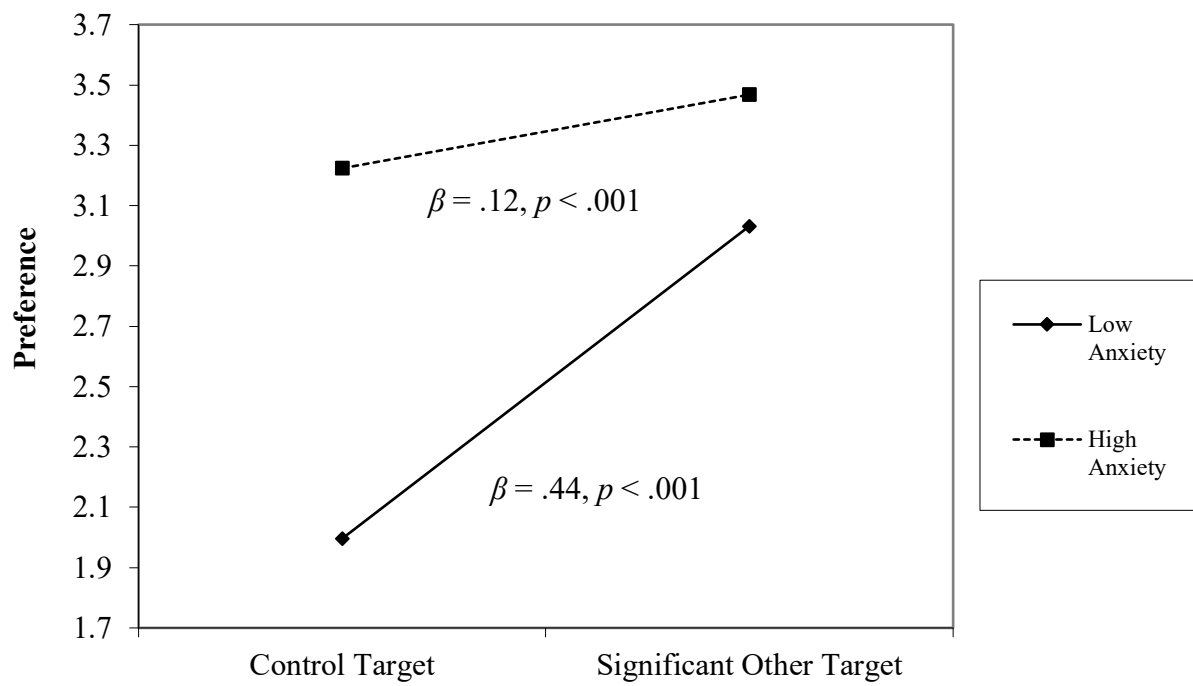


Figure 9. The effect of preference by target (Control Target v. Significant Other Target) at low and high anxiety.

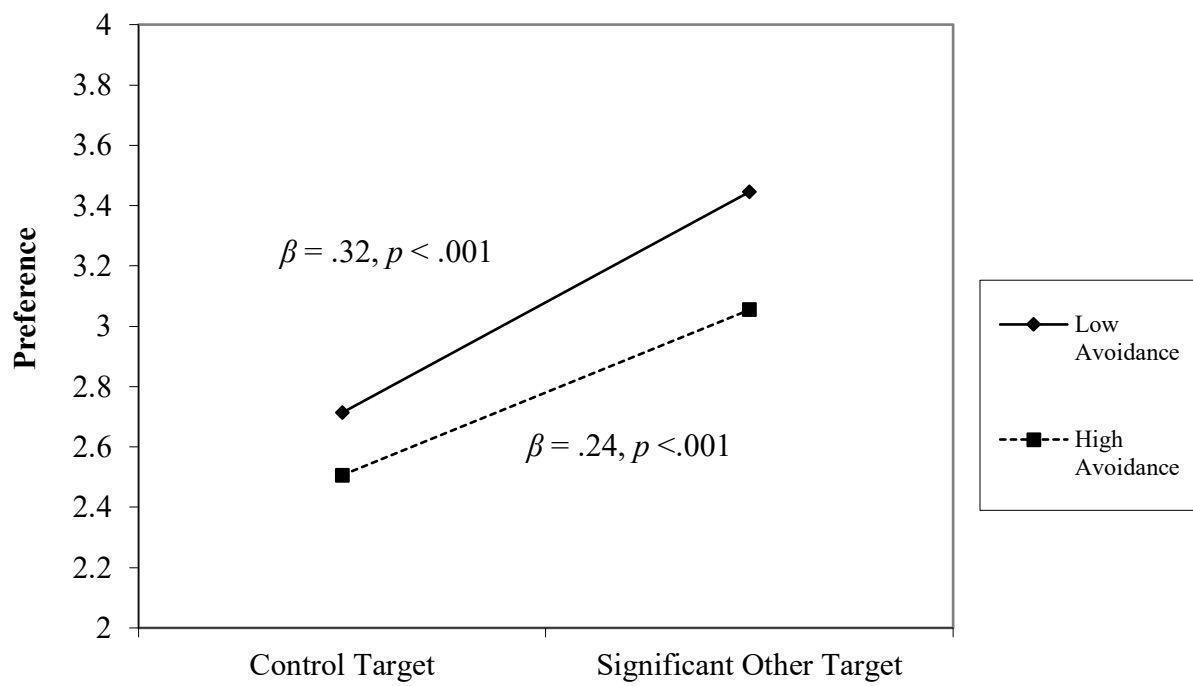


Figure 10. The effect of preference by target (Control Target v. Significant Other Target) at low and high avoidance.

APPENDIX B

Creating the Target Descriptions

Creating the Target Descriptions

First, a word bank of adjectives was created. Thirty words came from Brumbaugh and Fraley (2006); Brumbaugh and Fraley (2007) and 70 came from Chandler (2018) for a total of 50 words. Words high in meaningfulness (i.e., words 3.6 and above on a scale of 0 (*I have almost no idea of the meaning of this word*) to 4 (*I have a very clear and definite understanding of the meaning of this word*) were selected to be part of the study. Additionally, descriptors requiring an article (“a” or “an” were not included to maintain grammatical consistency for piping. Taylor’s word bank (the target created to resemble the ex-partner or parent) had 50 words participants could select from. The control targets (Alex, Jordan, Morgan, and Sam) did not require piping for the “Mad Lib” function, and thus did not have a word bank. Worth noting, the 30 words from Brumbaugh and Fraley (2006); Brumbaugh and Fraley (2007) came from Anderson (1968). Chandler (2018) is a replication of descriptive word likeability and meaningfulness. According to this replication, the 30 words from Anderson (1968) maintained high levels of meaningfulness based on my criteria.

Next, description “shells” were created. The descriptions included seven sentences, nine trait/descriptive words, and were similar in their ability to communicate the intended meaning and description. Five different descriptions were generated. The sentences in the significant other descriptions were left blank so that when participants selected words during the task, they could be piped in like a Mad Lib (e.g., “Taylor is <<ADJECTIVE>>”). The remaining four descriptions were bogus and contained pre-selected adjectives. Below is the significant other (Taylor) word bank, followed by the description shell, the false memory task, and the full list of 100 words.

Significant other Word Bank

proud	artistic	open-minded
lucky	modest	athletic
daring	curious	self-sufficient
subtle	positive	warm
objective	calm	enthusiastic
sentimental	moral	anxious
quick	casual	jealous
serious	innocent	confident
studious	conservative	reliable
humble	shy	agreeable
idealistic	unpredictable	immature
religious	decisive	opinionated
fashionable	romantic	clever
candid	authoritative	selfish
comical	smart	understanding
social	critical	polite
orderly	loyal	

Description

Taylor is very <<ADJECTIVE>>. Sometimes Taylor can be <<ADJECTIVE>> and <<ADJECTIVE>>. Other times, Taylor is <<ADJECTIVE>>. Taylor is occasionally <<ADJECTIVE>> and <<ADJECTIVE>>. Some friends say Taylor is <<ADJECTIVE>>. Taylor is really <<ADJECTIVE>>. Finally, Taylor is <<ADJECTIVE>>.

Memory Test

1. Taylor is occasionally <<ADJECTIVE>> and <<ADJECTIVE>>.
2. Finally, Taylor is <<ADJECTIVE>>.
3. Taylor is very <<ADJECTIVE>>.
4. Other times, Taylor is <<ADJECTIVE>>.
5. Taylor is usually <<ADJECTIVE>>.
6. Taylor is a little <<ADJECTIVE>>.
7. Taylor is <<ADJECTIVE>>.
8. Taylor can sometimes be <<ADJECTIVE>>.
9. Occasionally Taylor can be <<ADJECTIVE>>.
10. Above all, Taylor is <<ADJECTIVE>>.
11. Taylor is <<ADJECTIVE>>.
12. Close friends describe Taylor as <<ADJECTIVE>> and <<ADJECTIVE>>.
13. Taylor is <<ADJECTIVE>>.
14. Taylor is often <<ADJECTIVE>>.
15. Taylor can be <<ADJECTIVE>>.

Description

Alex is usually frank. Though, sometimes Alex can sometimes be nervous. Other times, Alex is immature and childish. Alex is really moral. Alex is occasionally self-conscious and sincere. Alex can also be inquisitive. In sum, Alex is impulsive.

Memory Test

1. Alex is really moral.
2. Other times, Alex is immature and childish.
3. Alex is occasionally self-conscious and sincere.
4. Alex can also be inquisitive.
5. Some friends say Alex is trusting.
6. Above all, Alex is warm-hearted.
7. Alex is very comical.
8. Alex is often rebellious.
9. Alex is a little curious.
10. Alex is stingy.
11. Alex is alert and authoritative.
12. Occasionally Alex can be modest.
13. Close friends describe Alex as reliable and lucky.
14. Finally, Alex is studious.
15. Alex is artistic.

Description

Jordan is intolerant. Occasionally Jordan can be athletic. Other times, Jordan is kind and friendly. Jordan is really relaxed. Jordan can also be idealistic. Above all, Jordan is loyal and polite. Finally, Jordan is perfectionistic.

Memory Test

1. Finally, Jordan is perfectionistic.
2. Jordan is intolerant.
3. Occasionally Jordan can be athletic.
4. Other times, Jordan is kind and friendly.
5. Jordan is occasionally smart and religious.
6. Close friends describe Jordan as domineering and possessive.
7. Jordan is very humble.
8. Jordan is often neglectful.
9. Jordan is usually wise.
10. Jordan is a little innocent.
11. Jordan can sometimes be agreeable.
12. Jordan is also courageous.
13. Some friends say Jordan is candid.
14. Jordan is disrespectful.
15. Sometimes Jordan can be quick.

Description

Above all, Morgan is easygoing. Morgan is occasionally annoying and ungrateful. Other times, Morgan is proud. Morgan is very clever. Morgan is also decisive and anxious. Morgan can sometimes be rational. Morgan is outspoken.

Memory Test

1. Morgan can sometimes be rational.
2. Morgan is very clever.
3. Above all, Morgan is easygoing.
4. Morgan is also decisive and anxious.
5. Sometimes Morgan can be warm and casual.
6. Morgan is often forgetful.
7. Occasionally Morgan can be extravagant.
8. Finally, Morgan is self-sufficient.
9. Morgan can sometimes be serious.
10. Close friends describe Morgan as creative and confident.
11. Morgan is a little cautious.
12. Morgan is really shy.
13. Morgan is opinionated.
14. Some friends say Morgan is selfish.
15. Morgan can be subtle.

Description

Sam can be positive. Close friends describe Sam as productive and daring. Other close friends say Sam is crude. Sam is very demanding. Sam is logical. Sometimes Sam can be conscientious and timid. Sam is often self-centered.

Memory Test

1. Sometimes Sam can be conscientious and timid.
2. Sam can be positive
3. Other close friends say Sam is crude.
4. Sam is very demanding.
5. Other times, Sam is romantic.
6. Above all, Sam is entertaining.
7. Sam is social and messy.
8. Sam can sometimes be fashionable.
9. Occasionally Sam can be negligent.
10. Sam is occasionally orderly and appreciative.
11. Sam is objective.
12. Sam is really critical.
13. Finally, Sam is good-natured.
14. Sam is usually unpredictable.
15. Sam is a little calm.

Full Word Bank

proud
lucky
daring
subtle
objective
sentimental
quick
serious
studious
humble
idealistic
religious
fashionable
candid
comical
social
orderly
artistic
modest
curious
positive
calm
moral
casual
innocent
conservative
shy
unpredictable
decisive
romantic
authoritative
smart
critical
loyal
open-minded
athletic
self-sufficient
warm
enthusiastic
anxious
jealous
confident
reliable

agreeable
immature
opinionated
clever
selfish
understanding
polite
possessive
relaxed
inquisitive
trusting
perfectionistic
bashful
nervous
timid
impulsive
friendly
self-centered
domineering
forgetful
messy
frank
sincere
alert
moody
logical
ungrateful
kind
stingy
rebellious
courageous
creative
easygoing
self-conscious
imaginative
cautious
rational
outspoken
demanding
intolerant
childish
disrespectful
warm-hearted
entertaining
negligent
phony

temperamental
conscientious
crude
good-natured
extravagant
wise
annoying
mean
neglectful
productive
appreciative

Study link:

[https://implicit.harvard.edu/implicit/Launch?study=/user/lauren/contract.chopik.custom//manage
r.expt.xml&refresh=true](https://implicit.harvard.edu/implicit/Launch?study=/user/lauren/contract.chopik.custom//manage
r.expt.xml&refresh=true)

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