

THE USE OF MATERIAL OBJECTS AS A SECURE BASE

BY

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## Abstract

Attachment theory proposes that people form and maintain close interpersonal relationships in part because they provide a secure base for personal growth. Emerging evidence expands on this insight by showing that people sometimes seek (and find) this secure base in non-human sources (e.g., pets), particularly under conditions of threatened or absent social connection. The current research presents the first evidence that material objects can serve as a secure base, increasing felt security and the willingness to explore. Priming a valued object prevented a loss of exploration intentions following threat (Study 1). Consistent with prior research, objects effectively bolstered security and exploration particularly when uncertainty about social support was dispositionally high (Study 2) and experimentally increased (Studies 3 & 4). Study 5 showed that, in the wake of support uncertainty, an object increased exploration only if participants appraised that object as dependable—a defining characteristic of a human secure base.

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## The Use of Material Objects as a Secure Base

Close, supportive relationships with others are an important component of both physical and psychological well-being (Cohen & McKay, 1984; Schwarzer & Leppin, 1989). According to attachment theory, this is because close relationships provide individuals with the material resources and emotional support necessary to cope with illness, failure, and various other adverse conditions they confront in their day-to-day lives (Bowlby, 1969/1992; Mikulincer & Shaver, 2007).

From the perspective of attachment theory, recent cultural shifts toward decreased community (Putnam, 1998), less intimacy (Turkle, 2012), and greater solitude (Klinenberg, 2013) are causes for concern, because they threaten to deprive people of the social support they need to thrive. How might individuals flourish within this changing cultural landscape?

Recent research finds that individuals gain many of the psychological benefits of close relationships from sources outside those relationships. In particular, research on *non-human support* finds that people seek (and find) support from things that are not human (e.g., pets), not alive (e.g., the home), and indeed may not exist at all (e.g., fictional characters) (for a review, see Keefer, Landau, & Sullivan, in press). Non-human targets can provide at least some of the support necessary for well-being, particularly when that support seems lacking in close relationships.

Building on this work, we propose that material objects can similarly provide psychological benefits that are traditionally thought to be unique to close relationships. Indirect support for this claim comes from evidence that people compensate for uncertainty about social support by turning to objects for security (Keefer, Landau, Rothschild, & Sullivan, 2012). Still, it remains to be tested whether objects are in fact capable of meeting people's needs for support.

Conventional wisdom would seem to suggest that whereas non-human targets such as a benevolent deity or affectionate pet can provide support, inanimate objects are too impoverished to serve this function. In fact, research on materialism (reviewed below) would lead us to expect that engaging with objects would have the opposite effect, undermining psychological well-being by instilling a sense of insecurity.

This paper reports a series of studies that programmatically test whether objects can confer support and whether this effect is moderated by characteristics of the individual, the situation, and the target objects. As we elaborate on below, prior attachment theory and research shows that a key benefit of close relationships is the provision of a *secure base*—a psychological foundation of felt security that supports the individual’s psychological growth, commonly operationalized as an openness (vs. reluctance) to explore unfamiliar aspects of one’s environment. Extending this work, we tested the effect of priming valued objects on felt security and intentions to explore. Studies 2-4 examined individual- and situation-level moderators, building on prior evidence that people derive support from non-human sources particularly when social support appears unreliable. We hypothesized that objects will provide a secure base particularly among individuals with high (vs. low) trait uncertainty about social support and those primed with uncertainties about social support. Because it is unlikely that all objects can provide a secure base, Study 5 examined the moderating role of perceived object features. We hypothesized that objects will serve as a secure base when they are viewed as dependable, but not when they are ascribed other positive qualities.

### **Attachment and Security**

John Bowlby was an early proponent of the idea that humans have an innate need for supportive relationships with others (1969/1992) – an idea which has since become axiomatic in

social psychology (Baumeister & Leary, 1995). Because human infants are born relatively helpless, they must depend on close others, particularly their parents and other caregivers, for every aspect of their survival and development. Thus, during our species' evolution, there were selective pressures to experience positive feelings of security in close relationships and to seek the support of close others, particularly in response to threatening circumstances. Building on Bowlby's analysis, contemporary attachment theorists propose that people are motivated throughout the lifespan to achieve and maintain security from their close relationships (Mikulincer & Shaver, 2007). Consequently, adult relationship partners can serve as attachment figures in much the same way as caregivers fill this role for their children.

**Security and exploration.** Attachment theory distinguishes two forms of security provided by close relationships. For one, attachment figures offer assistance with imminent threats to one's safety or survival. For example, if an individual is ill, seeking a caregiver who will provide treatment is beneficial. This is referred to as the *safe haven* function of attachment figures: seeking a source of security to provide assistance with immediate threats to personal well-being. While this security-seeking may have evolved specifically to cope with external hazards, people nevertheless respond to even intrapsychic threats (e.g., awareness of one's mortality) by turning to others who can restore a sense of well-being (Cox et al., 2008; Shaver & Mikulincer, 2012).

Second, people derive feelings of security from the perception that a caregiver *would* be available if support were necessary. This is referred to as a *secure base*: a retreat that remains available, even if currently unnecessary (Feeney & Collins, 2004). In this way, close others allow people to feel secure by their perception that support would be available if some threat were to arise.



These two forms of security work in tandem to protect people against threats and promote their strivings toward self-determination and psychological growth. When individuals confront illness, threats to self-esteem, and other external hazards, the safe haven function enables them to seek proximity to an attachment figure capable of providing immediate assistance and reassurance. When the environment is relatively safe, the secure base function emboldens individuals to explore their environment and expand their behavioral repertoire, secure in the knowledge that support would be available from attachment figures if needed. <sup>1</sup>

Studies show that a secure base promotes exploration and personal growth across the lifespan (Feeney & Van Vleet, 2010). In early observational studies, children with more supportive caregivers were more willing to explore and learn in a novel environment (Ainsworth et al., 1978). Similarly, adults who perceived their romantic partners as available and encouraging formed more goals for the future and felt more confident in their ability to achieve those goals (Feeney, 2004). Observers' ratings of romantic partners' support similarly predicted participants' enjoyment of novel, challenging tasks (Feeney & Thrush, 2010).

Indeed, close others need not be physically present to serve as a secure base. Studies show that the mere perception of social support fosters exploration and openness to new perspectives. For example, participants who felt that close others would be available to provide support demonstrated a greater willingness to explore novel experiences and ideas (Green & Campbell, 2000). Even implicitly primed cues for supportive others (e.g., very brief exposure to close others' names) led participants to adopt more creative problem solving strategies (Mikulincer, Shaver, & Rom, 2011).

How does perceived social support promote exploration and growth? Prior research has identified two distinct explanations. First, *emotional responses* to social support promote growth.

According to the *broaden-and-build* theory of emotions (Fredrickson, 1998; 2003), positive emotions like love and security promote personal growth by signaling to the individual that it is safe to branch out and explore unfamiliar aspects of the environment. Supporting studies show, for example, that participants who watched amusing (vs. neutral) films generated more diverse and complex plans for the future (Fredrickson & Branigan, 2005). Related studies show that positive emotions also help to buffer individuals from negative emotions that might undermine growth. In one such study (Fredrickson et al., 2000), participants were primed with feelings of anxiety by being told that they might have to prepare (and deliver) a three-minute speech on an unspecified topic. All participants were then told that they were not selected for this task and that they would instead watch a video clip. Those who saw a positive (vs. neutral) film more quickly returned to baseline levels of cardiovascular activity from the spike they initially experienced (for related effects, see Taylor et al., 2000; Tugade & Fredrickson, 2004). Social support promotes growth in part by affording these positive emotional experiences.

Aside from these emotional processes, *cognitive appraisals* of close others provide the confidence to take risks and pursue novel experiences. Specifically, appraisals of close others as *dependable*; *non-intrusive*; and *encouraging* predict numerous growth outcomes including self-efficacy, interest in independent exploration, and confidence in personal goal pursuit (Feeney, 2007; Feeney & Thrush, 2010). Each of these three appraisal dimensions uniquely predicted growth, presumably because these expectations allow the individual to plan more confidently for the future.

**Attachment and uncertainty.** Deriving a secure base from close relationships depends not only on the availability of supportive close others, but also on the individual's willingness to seek out and rely on social support. What accounts for these differences in attachment behavior?

Bowlby, a student of Melanie Klein, was steeped in an object relations tradition that privileged the role of cognitive representations of other people in social interactions (Ainsworth, 1969).

*Internal working models*, Bowlby's term for these representations of close others, arise from and shape interactions between infants and caregivers. People learn from experience what to expect from their caregivers and act based on these expectations.

Traditionally, these cognitive representations have been organized into three broad categories (e.g., Hazan & Shaver, 1987). *Secure attachment*, proposed by Bowlby and other theorists as a healthy form of attachment, is defined by a cognitive model of others as trustworthy and reliable. A history of positive, reliable interactions with caregivers teaches people to trust others and to be comfortable relying on them in times of need.

People whose attachment figures consistently reject them in times of need instead learn that relying on others is not an effective way to manage distress. These individuals instead develop the expectation that others are untrustworthy and rejecting. According to attachment theory, these individuals develop *attachment avoidance*: defensively maintaining independence and emotional distance from close others to avoid anticipated rejection (Mikulincer & Shaver, 2007).

Finally, some individuals receive inconsistent or unpredictable assistance from their caregivers, and as a result learn a model in which there is considerable uncertainty about the availability of interpersonal support. Under these conditions, individuals develop *attachment anxiety*: constant vigilance and intense concern that close others will not be available in times of need (Mikulincer & Shaver, 2007). To minimize attachment anxiety, people use strategies intended to reduce uncertainty about others' availability and ability to provide support. For instance, they may exhibit insistent attempts to establish proximity to a partner, elicit support

through clinging and controlling behavior, or seek out alternative, more dependable sources of support.

While there is considerable variability in people's underlying representations of close others, attachment avoidance and anxiety have remained useful prototypes for contemporary understandings of differences in attachment behavior (Brennan, Shaver, & Clark, 1998; Fraley et al., 2011). Specifically, anxiety (i.e., uncertainty about others) and avoidance (i.e., avoiding reliance on others) are considered unique dimensions along which expectations about close others can be organized. More securely attached ("healthy") individuals are simply said to be low on both of these dimensions.

### **Non-human Support**

One response to the uncertainty of attachment anxiety is to seek out alternative, more predictable sources of support. Emerging lines of research show that one way individuals pursue these alternatives is to seek support from a range of non-human security sources (Keefer et al., in press). As we will see in reviewing this work, people seek out non-human support sources particularly when they lack close relationships to other people, or when they perceive that others' support is unreliable or inadequate.

One of the most well-documented forms of non-human support-seeking is directed toward divine figures, such as saints, spirits, or the God of Abrahamic religions (Kirkpatrick, 2005). Individuals who feel greater attachment anxiety (i.e., uncertainty) about their close relationships report more intimate relationships with God (Granqvist & Hagekull, 1999) and are more likely to experience sudden religious conversion (Granqvist & Kirkpatrick, 2004). Studies show that these bonds with a deity fulfill many of the roles of interpersonal support (for a review, see Granqvist & Kirkpatrick, 2008). For example, when Christian children were given a

storyboard to illustrate a story in which they faced a threatening situation (e.g., physical injury), they placed a figure representing God significantly closer to a figure representing themselves (Granqvist, Ljungdahl, & Dickie, 2007). This increased symbolic proximity is analogous to proximity seeking in response to threat – the safe haven function traditionally reserved for human attachment figures.

Pets can also serve as supplemental sources of security (for a review, see Sable, 2013). When faced with insufficient interpersonal support, individuals compensate by seeking emotional support from their pets (Krause-Parello, 2012). Evidence suggests that this compensation is effective: In quasi-experimental clinical studies, pet therapy has helped people manage anxiety and develop feelings of independence (Barker & Dawson, 1998; Churchill et al., 1999). Related experimental studies show that pets serve the safe haven function of attachment figures, providing feelings of security in response to threat. McConnell and colleagues (2011) showed that, for participants primed with experiences of social rejection, thinking about a favorite pet or a best friend equally restored feelings of belonging compared to a neutral comparison condition.<sup>2</sup>

Together, these studies show that people compensate for uncertainty about social support by seeking support from non-human sources. This raises a question: does investing in non-human support sources effectively provide the secure base traditionally ascribed to interpersonal support? At first blush, this may seem an unlikely possibility: after all, pets and deities seem to be incapable of providing the kind of interpersonal encouragement that typifies a human secure base.

Yet mounting evidence shows that non-human support sources can fulfill the secure base function. In one study (Beck, 2006), Christians who had more secure attachments to God (i.e.,

who were more confident that they could depend on God for support) were more open to thinking about novel ideas, including alternative religious views, and were less orthodox in their theology. Pets also appear to provide a secure base. Zilcha-Mano and colleagues (2012) found that individuals with secure attachments to their pets generated more personal goals and felt more confident they could attain them (using the same measures developed in research on interpersonal attachment; Feeney, 2004) when a pet was either physically present or imagined (compared to a no-pet comparison).

### **The Current Research: Material Objects as a Secure Base**

Our goal in the current research is to build on the work just reviewed to examine whether or not material (i.e., inert) objects can provide a secure base. We also aimed to extend prior research by examining the role played by positive emotional experiences of security and cognitive appraisals of a security source's dependability. As noted earlier, these processes have been shown to underlie the secure base function in the realm of interpersonal relationships, yet to our knowledge they have not been examined in the context of non-human support seeking.

A series of studies by Keefer et al. (2012) has already established a causal link between uncertainty about social support (or *support uncertainty*, for short) and investment in objects. In one of these studies, participants primed with support uncertainty became more attached to their belongings, and this effect was due specifically to feelings of attachment anxiety. A follow-up study showed that participants primed with support uncertainty felt greater separation anxiety after having their cell phones removed from the cubicle (signaling an attachment bond; Ainsworth & Bell, 1970), and this effect was independent of the phone's perceived ability to help participants connect with close others.

Despite these findings, it may seem highly counterintuitive that objects could, in fact,

provide a secure base. After all, objects clearly lack the capacities for care and concern that typify a caregiver from the perspective of traditional attachment theory. In fact, some lines of research suggest that seeking support in objects will have the opposite effect, undermining psychological growth. Investment in material objects (as reflected by materialistic values) predicts decreased interest in intellectual growth (and poorer academic performance as a result; Ku, Dittmar, & Banerjee, 2012), fewer experiences of genuine interest or engagement (Kasser, 2002), and a more egocentric emphasis on personal pleasure over long-term relational (Flouri, 2004) and collective well-being (Kasser, 2011b). This research is grounded in the idea that the desire for material things de-emphasizes the importance of more intrinsic psychological needs necessary for personal growth and development (specifically, competence, relatedness, and autonomy; Deci & Ryan, 2012).

Yet theorists propose that objects afford security *by virtue of* their passivity (Winnicott, 1953/1986). Most people learn as infants that they can exercise total control over objects because they do not resist or act unpredictably. According to Winnicott, engaging with objects such as blankets and stuffed animals serves as a primary means of maintaining perceived personal control as children become aware of the limits of their control over the world. This analysis suggests that relating to objects can trigger positive emotional experiences of security, particularly if they are appraised as dependable, and in this way provide a secure base for exploration.

Integrating theorizing on non-human support seeking and materialism, we hypothesized that objects will serve as a secure base when individuals are motivated to turn to those objects as a source of security, that is, when they experience support uncertainty. When support uncertainty is salient, we expect that a reminder of a desired object will increase exploration, but following

research on materialism, we expect that when people are not uncertain, thinking of a desired object will instead undermine exploration. We tested these predictions in Study 1.

Extending this theorizing, we predicted that thinking of a close other (vs. a desired object) would result in greater feelings of security for individuals low in support uncertainty, but that under high support uncertainty thinking of a desired object would result in more security than thinking of a close other. We tested this moderation hypothesis using both individual differences in attachment anxiety, one form of support uncertainty (Study 2) as well as employing two different experimental procedures designed to prime support uncertainty (Studies 3 and 4).

Finally, in Study 5 we focus on the moderating role of features of the secure base object. Based on prior research on the secure base function in interpersonal relationships, we predicted that individuals high in support uncertainty would report greater willingness to explore when in the presence of an object appraised as dependable (vs. merely positive).

We focused specifically on priming participants to think of an object that they wished they owned as a secure base target in Studies 1-4. This was intended to allow participants to imagine an ideal object without prior history and to thereby minimize individual differences in people's current belongings. This approach introduced some confounds that were addressed in the later studies: by focusing people on a hypothetical, rather than current, source of security, there is a marked difference between the desired object conditions across these studies and a comparison secure base prime condition in which participants brought to mind a current close relationship partner (used in Studies 1-4). We addressed this issue in Study 2 by including an additional comparison condition that priming hypothetical success at a (non-object related) personal goal and further addressed this point in Study 5 by providing participants with a



particular object. Additionally, it was rare for participants to bring to mind objects that were completely novel or unfamiliar: participants' idiosyncratic selection of a desired object almost universally focused on improved versions of objects that participants currently owned (e.g., a new car, new outfits). Very few participants indicated objects that were not real (e.g., "a money tree") or completely novel (e.g., "an NCAA championship ring"), suggesting that participants already had some degree of familiarity with the objects they identified.

### Study 1

Study 1 provided an initial test of the effectiveness of objects as a secure base. We built on prior research demonstrating that exposure to information about uncertain (albeit hypothetical) relationships reduced participants' own interest in novel, growth-promoting experiences, ostensibly because this information subtly primed uncertainty about the availability of support (Green & Campbell, 2000). If objects can serve as a secure base, then thinking of a valued object following this prime should eliminate the diminishing effect of support uncertainty on exploration. Specifically, we predicted that:

*H1: Participants who were primed with uncertainty, and then led to focus on a valued object, would report exploration intentions higher than those not primed with a support source and statistically similar to those not primed with support uncertainty.*

Additionally, we included a comparison condition in which participants thought about a close relationship partner. On the basis of our claim that objects and close others can equally serve a secure base function, we predicted that:

*H2: Focusing on a valued object following the subtle support uncertainty prime would restore exploration to the same levels as bringing to mind a trusted close other.*

We also tested our claim that objects provide a secure base particularly when support

uncertainty is increased. On the basis of the aforementioned work on materialism, we expected that:

*H3: Participants who read about supportive relationships would respond to the salience of a desired object with decreased exploration.*

### **Method**

One-hundred three undergraduates from a large Midwestern university (59 women)<sup>3</sup> participated for course credit in a study described as research on personality and memory ability.

#### **Support Manipulation**

First, ostensibly as part of a memory task, participants were instructed to memorize a list of 10 sentences. In reality, participants were randomly assigned to receive one of two lists previously shown to induce feelings of certainty (or uncertainty) about social support (Green & Campbell, 2000). In the *support certainty* condition, seven sentences referred to trusting relationships (e.g., “Jean comforted her child”); in the *support uncertainty* condition, seven sentences referred to uncertainty about relationships (e.g., “Jean is worried her boyfriend will leave her”). Three filler sentences were the same across conditions (see Appendix A for details). All participants were given 3 minutes to rehearse these sentences then were asked to recall them.

#### **Secure Base Target Manipulation**

Participants were then provided with a picture frame containing a blank piece of paper and a marker with which to write the name of a target. As a cover story, written instructions described this task as an opportunity to personalize the cubicle and, ultimately, feel more comfortable “being themselves” as they answered upcoming questions about their personality. The instructions for the task comprised our manipulation of the salience of one of three secure base targets (Appendix B). Participants were randomly assigned to write on the paper their

initials (*no target*), the name of a close friend or family member (*close other*), or the name of a belonging they wished they owned (*object*). All participants were then instructed to place the frame on the desk where they could see it for the remainder of the session.

### **Motivation to Explore**

Finally, participants completed a validated self-report measure of motivation to explore (Green & Campbell, 2000; Routledge & Arndt, 2009). Participants rated their agreement (1 = *Strongly disagree*; 7 = *Strongly agree*) with 18 items assessing their interest in exploring novel experiences and ideas (sample items: “I would enjoy being introduced to new people”; “If given the chance, I would enjoy exploring unusual ideas or theories.”; see Appendix C for full item listing). Following prior research we averaged responses to form composite exploration scores ( $\alpha = .84$ ,  $M_{grand} = 5.27$ ,  $SD = .75$ ).

### **Results**

Submitting motivation to explore scores to a 2 (*support certainty* vs. *support uncertainty*)  $\times$  3 (*secure base target: no target* vs. *close other* vs. *object*) between-subjects ANOVA returned the predicted interaction,  $F(2, 97) = 5.74$ ,  $p = .004$ ,  $\eta_p^2 = .11$  (observed power = .89), but no main effects of support,  $F(1,97) = .12$ ,  $p = .73$ , or secure base target condition,  $F(2, 97) = 1.24$ ,  $p = .29$ .

Pair-wise comparisons (Fisher's LSD) and the pattern of means depicted in Figure 1 show, within the no target condition, priming support uncertainty decreased exploration intentions ( $M = 4.89$ ,  $SD = .81$ ) compared to priming support certainty ( $M = 5.50$ ,  $SD = .80$ ,  $p = .02$ ). This replicates the effect reported by Green and Campbell (2000).

As predicted, bringing to mind a secure base target eliminated this effect. Participants primed with support uncertainty who subsequently thought of a desired object ( $M = 5.41$ ,  $SD = .72$ ) or close other ( $M = 5.49$ ,  $SD = .69$ ) expressed more interest in exploration than those in the

uncertainty/no target condition ( $ps = .04$  and  $.02$ , respectively). The two secure base target conditions did not differ ( $p = .77$ ).

Consistent with prior materialism research, we found that, within the support certainty condition, participants primed with a desired object were less interested in exploration ( $M = 4.94$ ,  $SD = .72$ ) than participants in the close other ( $M = 5.47$ ,  $SD = .53$ ,  $p = .03$ ) and no target conditions ( $M = 5.50$ ,  $SD = .80$ ,  $p = .02$ ).

Within the close other condition, participants' exploration intentions did not differ as a function of support condition ( $p = .78$ ). Participants in the object condition reported higher exploration intentions when primed with support uncertainty compared to support certainty ( $p = .03$ ).

### **Discussion**

The results of Study 1 provide initial evidence that objects can serve as a secure base, as operationalized as an individual's intentions to explore. Replicating prior research, we found that exposure to unsupportive, hypothetical relationships decreased interest in exploration for participants who were not provided with a reminder of a secure base target. However, this effect was eliminated for those who were subsequently led to focus on a valued object. In fact, bringing an object to mind restored exploration intentions to the same degree as thinking about a close, trusted other, suggesting that an object can provide a secure base as effectively as an interpersonal relationship.

Also consistent with predictions, we found that individuals primed with support certainty became less interested in exploration when they thought about a desired object. While exploration intentions for those who thought of a close other or no target were similar in the support certainty condition, objects served as a secure base for exploration only when

participants were initially primed with support uncertainty, and had the opposite effect under conditions of primed certainty.

The results of Study 1 provide initial evidence that objects can serve the secure base function, but it is possible that participants who thought of an object reported higher exploration intentions through processes unrelated to the object itself. Reminders of a desired object may have motivated exploration because thinking of a valued, personal goal (regardless of the content) may have been self-affirming. Prior research shows that even incidental reminders of personal goals can cue positive feelings about the self (McQueen & Klein, 2006) and that people experiencing such affirmations become less defensive as a result (Sherman & Cohen, 2006) and feel secure in much the same way as individuals with secure interpersonal attachments (Hart, Shaver, & Goldenberg, 2005). As a result, self-affirmation may offer an alternative explanation for why thinking of a desired object buffered the negative effects of support uncertainty on motivation to explore and we address this possibility in Study 2.

The results of Study 1 also offer only a limited test of the role of support uncertainty in moderating the effectiveness of objects as a secure base. The support uncertainty induction employed in Study 1 relies on exposure to information about hypothetical relationships and as a result, we cannot be sure that participants actually felt uncertain about the availability of support in their own relationships. Additionally, while exploration intentions are a useful index of the extent to which participants have a secure base, they offer only partial insight into the extent to which a target serves as a secure base. The remaining studies address these issues by testing the role of personally relevant support uncertainty and employing a range of outcome measures to provide converging evidence for the role of objects as a secure base.

## **Study 2**

While the results of Study 1 supported our predictions, we cannot determine whether feelings of uncertainty about the availability of social support increased the extent to which the object (vs. no target) prime increased exploration intentions. To address this issue, Study 2 relied on individual differences in attachment anxiety, or the extent to which participants experience support uncertainty about their own relationships. Studies 3 and 4 specifically manipulated feelings of support uncertainty about one's own relationships to provide evidence for the causal role of this uncertainty. Finally, Study 5 went further by testing whether relationship support uncertainty increased the secure base effectiveness of particular objects, namely those appraised as dependable. Throughout these studies, we also took efforts to explore a broad range of outcome measures selected to provide converging evidence for our claims, including both affective measures (Study 2) and assessments of a variety of forms of exploration intentions (Studies 2-5).

After assessing individual differences in attachment anxiety in Study 2, we asked participants to reflect on a desired object or a close other before reporting how secure they felt. We expected that:

*H1: For people who were relatively high in attachment anxiety, thinking of an object (vs. close other) would result in greater feelings of security.*

In other words, we expected that objects should be more reassuring than close others for individuals who felt uncertain about their relationships. Conversely, we expected the opposite would hold for participants who felt more secure in their interpersonal attachments:

*H2: For participants low in attachment anxiety, thinking of a desired object would provide comparatively lower feelings of security than thinking of a close other.*

Additionally, we included a comparison condition in which participants affirmed a

personal goal. As noted above, it is possible that Study 1 participants primed with support uncertainty (albeit subtly) expressed greater exploration intentions in the object condition because this prime affirmed a personal goal rather than priming an object per se. However, because uncertainty about social support motivates support-seeking from objects:

*H3: Under high attachment anxiety, a reminder of a desired object would promote greater feelings of security than a goal affirmation.*

Following considerable research on the effects of self-affirmation, we expected that:

*H4: Affirming a personal goal would result in greater feelings of security than thinking of a desired object for participants who generally felt confident they could trust close others.*

Finally, to provide evidence for the specific moderating role of support uncertainty, we also tested whether the predicted moderation effects extend to attachment avoidance, a defensive resistance to relying on others. Because anxiety (but not avoidance) is characterized by support uncertainty, we expected that:

*H5: Attachment anxiety, but not attachment avoidance, would moderate the effectiveness of objects as a source of security.*

## **Method**

Two-hundred eight American adults (152 Women,  $M_{\text{age}} = 37.20$ , 80% White) were recruited through Amazon's Mechanical Turk (payment = \$.75) for a purported study of personality and close relationships.

### **Attachment Anxiety and Avoidance**

Individual differences in attachment anxiety and avoidance were assessed using the ECR-RS (Fraley et al., 2011), a validated self-report measure assessing both attachment dimensions

across four relationships (mother, father, romantic partner, best friend). For each relationship, participants rated their agreement (1 = *Strongly disagree*; 7 = *Strongly agree*) with six statements assessing attachment avoidance (e.g., “I prefer not to show this person how I feel deep down”; “It helps to turn to this person in times of need” (reverse-scored)) and three statements assessing anxiety (e.g., “I’m afraid that this person doesn’t really care for me”; “I’m afraid that this person may abandon me”; see Appendix D for full listing of items). Measures of anxiety ( $\alpha_{\text{range}} = .93-.96$ ) and avoidance ( $\alpha_{\text{range}} = .92-.95$ ) were highly reliable across the relationship types. Following the scoring procedure of Fraley and colleagues, we averaged scores for the four relationships to form composite indices of anxiety ( $\alpha = .77$ ,  $M_{\text{grand}} = 2.52$ ,  $SD = 1.36$ ) and avoidance ( $\alpha = .54$ ,  $M_{\text{grand}} = 3.02$ ,  $SD = 1.03$ ).

### **Secure Base Target Manipulation**

Then, as part of an ostensible personality assessment, participants were randomly assigned to one of three essay writing primes designed to cue reminders of either a *close other*, desired *object*, or a personally valued *goal* (following previously validated self-affirmation procedures; e.g., Cohen, Aronson, & Steele, 2000).<sup>4</sup> Specifically, participants were asked to identify and describe the target, then to talk about the influence that target has on their life (see Appendix E for full instructions).

### **Felt Security**

Finally, participants completed a 15-item assessment of their feelings. Participants rated how much they currently felt (1 = *Not at all*; 6 = *Very much*) a series of affective states shown in prior research to predict motives for personal growth and exploration (e.g., “Comforted”; “Supported”; “Safe”; Luke, Sedikides, & Carnelley, 2012). The items (Appendix F) formed a reliable composite index of felt security ( $\alpha = .95$ ,  $M_{\text{grand}} = 4.36$ ,  $SD = 1.15$ ).



## Results

Felt security scores were regressed onto attachment anxiety (mean-centered), secure base target condition (dummy-coded with close other as the comparison condition), and their interaction. This model returned a significant main effect of anxiety,  $\beta = -.57$ ,  $SE = .08$ ,  $t(202) = 5.61$ ,  $p < .0001$  (*observed power* = .99), and a significant interaction between anxiety and the object secure base condition,  $\beta = .55$ ,  $SE = .12$ ,  $t(202) = 3.61$ ,  $p < .001$  (*observed power* = .99). At mean levels of anxiety, there were no main effects of the goal condition ( $\beta = -.17$ ,  $SE = .15$ ,  $t(202) = 1.49$ ,  $p = .14$ ) nor the object condition ( $\beta = .08$ ,  $SE = .16$ ,  $t(202) = .44$ ,  $p = .65$ ), and there was no significant interaction between anxiety and the goal condition ( $\beta = -.06$ ,  $SE = .10$ ,  $t(202) = .83$ ,  $p = .40$ ).

We first probed this interaction (Figure 2) by testing the effects of secure base condition at high and low levels of attachment anxiety. For participants reporting high (+1 SD) attachment anxiety, those reminded of an object felt significantly more secure than those who thought of a close other ( $\beta = .34$ ,  $SE = .24$ ,  $t(202) = 2.70$ ,  $p = .008$ ) or a personal goal ( $\beta = .47$ ,  $SE = .23$ ,  $t(202) = 4.33$ ,  $p < .0001$ ). While the latter two conditions did not significantly differ, high anxiety individuals in the close other condition felt marginally more secure than those reminded of a goal ( $\beta = -.16$ ,  $SE = .19$ ,  $t(202) = 1.79$ ,  $p = .07$ ). At low (-1 SD) levels of attachment anxiety, those reminded of a desired object felt significantly less secure than those who thought of a close other ( $\beta = -.27$ ,  $SE = .21$ ,  $t(202) = 2.47$ ,  $p = .01$ ) or a personal goal ( $\beta = -.20$ ,  $SE = .21$ ,  $t(202) = 1.95$ ,  $p = .05$ ). The latter two conditions did not differ ( $\beta = -.04$ ,  $SE = .21$ ,  $t(202) = .50$ ,  $p = .62$ ).

Probing this interaction by secure base condition showed that while attachment anxiety predicted decreased feelings of security for participants in the close other ( $\beta = -.59$ ,  $SE = .08$ ,

$t(64) = 5.95, p < .0001$ ) and goal conditions ( $\beta = -.66, SE = .07, t(72) = 7.65, p < .0001$ ), there was no association between anxiety and felt security for participants primed with a desired object ( $\beta = -.01, SE = .10, t(66) = .13, p = .90$ ).

All significant effects of anxiety remained significant even after controlling for the effects of attachment avoidance ( $\beta = -.25, SE = .07, t(201) = 2.92, p = .004$ ) (*observed power* = .90). Controlling for anxiety, there were no interactions between attachment avoidance and either the object ( $\beta = .17, SE = .17, t(201) = .82, p = .41$ ) or goal ( $\beta = .01, SE = .15, t(201) = .07, p = .95$ ) conditions and these effects remained non-significant even without controlling for anxiety in the model ( $ps = .11$  and  $.92$ , respectively).<sup>5</sup>

### Discussion

Study 2 provides further evidence for our claim that support uncertainty moderates the effectiveness of a target object as a secure base. Specifically, we found that people who were generally higher in attachment anxiety felt more secure after thinking about a desired object (vs. close other or personal goal). However, for participants who were lower in attachment anxiety, thinking about a close other or goal resulted in comparatively higher security than thinking of an object.

The results of Study 2 replicate and extend the findings of Study 1. Consistent with Study 1 and research on materialism, we found that focusing on a desired object actually undercut security for participants who were generally confident that they could turn to close others for support. Additionally, we found that when participants felt more uncertain about their own relationships, reminders of a desired object enabled them to feel more secure than thinking of either a close other or affirming a personal goal.

The results of this study help to address the possibility that the previously observed

effects of the object prime on motivation to explore were merely the result of affirming a personal goal rather than thinking of a desired object specifically. This self-affirmation alternative cannot account for fact that thinking of a desired object (vs. a personal goal) led to greater feelings of security for participants high in support uncertainty: If the benefits of thinking of a desired object were due to self-affirmation, these conditions would have been similar, which they were not.

While Study 2 provides evidence for claim that support uncertainty increases the effectiveness of objects as a secure base, the reliance on individual differences in attachment anxiety leaves two important questions. First, attachment anxiety represents a cluster of closely related (yet distinct) experiences, including feelings of dependence (Cassidy, 2000), negative views of the self (Bartholomew & Horowitz, 1991), and a persistent desire for validation (Mikulincer & Shaver, 2007). It is possible that one of these facets, rather than support uncertainty specifically, accounted for the observed differences in Study 2. Additionally, by relying on an individual difference moderator, it is possible that support uncertainty did not cause the observed pattern of moderation: For example, it may be that some confounding third variable increased both support uncertainty and the relative effectiveness of a desired object as a secure base. To test whether support uncertainty actually caused objects to become more effective than close others as a secure base, we turned to an experimental approach in Study 3.

### **Study 3**

Study 3 was designed to provide further evidence for the moderating role of support uncertainty by directly addressing two important limitations of the previous study. By manipulating support uncertainty specifically, we attempted to avoid other confounding aspects of attachment anxiety as well as directly testing the causal role of uncertainty about the

availability of support in one's close relationships.

For the study we exposed all participants to information about uncertain hypothetical relationships (as in Study 1). Then we randomly assigned participants to think of ways that their own experiences were similar to those fictional relationships (in order to prime high support uncertainty), or ways in which their own experiences were similar to neutral experiences (low support uncertainty). Participants then thought of either a close other or desired object, as in Study 1, before we assessed their exploration intentions.

On the basis of our prior theorizing, we predicted that:

*H1: Participants who thought of a desirable object would report greater interest in exploration under high (vs. low) support uncertainty.*

In contrast, we expected support uncertainty to have the opposite effect for those in the close other condition, specifically:

*H2: Increased support uncertainty would decrease the extent to which a reminder of a close other would increase exploration intentions.*

Finally, following Study 2's results we expected that:

*H3: Those who thought of an object (vs. close other) would report greater interest in exploration under high support uncertainty.*

## **Method**

Seventy-nine undergraduates at a large Midwestern university (41 women,  $M_{age} = 19.41$ ; 76% White) participated for course credit in a study using the same cover story as Study 1.

### **Support Uncertainty Manipulation**

First, all participants received the *support uncertainty* prime used in Study 1, which asked participants to read about seven uncertain hypothetical relationships and rehearse this

information for 3 minutes. After completing the recall phase of this task, participants were then asked to write two essays describing personal experiences similar to the sentences provided in the memory task, also ostensibly as a memory assessment (Appendix G). For participants in the *low support uncertainty* condition, the instructions asked participants to write about experiences similar to two of the filler sentences in the memory task: “Matt ate the leftover pizza for lunch yesterday”; “Zach arranged the chairs neatly around the table.” For participants in the *high support uncertainty* condition, these sentences were replaced with two sentences about uncertain relationships: “Rachel has a hard time trusting other people” and “Ellen is constantly worried that her boyfriend will leave her.” Participants were asked to write in as much detail as possible about how their experiences were similar to these examples, what happened, and how they felt about those experiences.

### **Secure Base Target Manipulation**

Participants were then asked to write the name of either a *close other* or a desired *object* in a picture frame using the same materials and instructions used in Study 1.

### **Motivation to Explore**

Finally, participants completed the motivation to explore measure used in Study 1 ( $\alpha = .85$ ,  $M_{grand} = 5.22$ ,  $SD = .67$ ).

## **Results**

Submitting motivation to explore scores to a 2 (support uncertainty: *low* vs. *high*)  $\times$  2 (secure base target: *close other* vs. *object*) ANOVA returned the predicted interaction,  $F(1, 75) = 11.02$ ,  $p = .001$ ,  $\eta_p^2 = .15$  (*observed power* = .95) but no main effects of either support uncertainty,  $F(1, 75) = .82$ ,  $p = .37$ , or secure base target,  $F(1, 75) = .99$ ,  $p = .33$ .

Probing the interaction (Figure 3) by secure base target (Fisher’s LSD) revealed that

participants reminded of a desired object showed significantly greater interest in exploration under high support uncertainty ( $M = 5.61$ ,  $SD = .61$ ) compared to low uncertainty ( $M = 5.02$ ,  $SD = .78$ ;  $p = .01$ ). For participants reminded of a close other, we found that those primed with high support uncertainty were significantly less interested in exploration ( $M = 4.93$ ,  $SD = .43$ ) than those primed with low uncertainty ( $M = 5.30$ ,  $SD = .63$ ;  $p = .04$ ).

Replicating Study 1, we found that under low support uncertainty participants reminded of a close other did not differ in their exploration intentions compared to participants who thought of a desired object ( $p = .20$ ). However, under conditions of high uncertainty, participants who thought of a close other reported significantly lower interest in exploration than those participants who thought of an object ( $p = .001$ ).

### **Discussion**

The results of Study 3 provide direct evidence for our claim that support uncertainty moderates the effectiveness of objects as a secure base. We found that reminders of a desired object led to greater interest in exploration under high (vs. low) uncertainty. In contrast, we found that those participants who instead thought of a close other expressed greater motivation to explore when support uncertainty was low (vs. high).

Even though the support uncertainty conditions in Study 3 were largely matched in terms of content, they differed in some ways that could support an alternative account for the observed moderation. For example, people in the high uncertainty condition were asked to write about two negative personal relationships and may have simply felt more negatively about themselves or close others. To provide further support for our claim that support uncertainty (and not merely negative affect) underlies the differences observed in Study 3, we used a subtler priming procedure in Study 4.

## Study 4

Study 4 further tested our claim that feelings of support uncertainty moderate the effectiveness of objects in motivating exploration by using a more subtle priming procedure. First, we asked all participants to think of experiences in which they felt uncertain about the supportiveness of one close relationship partner. They were then asked to either think of how that relationship is similar to (vs. unique from) their other relationships to either isolate those feelings of support uncertainty to a specific relationship (*low support uncertainty*) or to generalize those doubts (*high support uncertainty*). By manipulating support uncertainty in this way, we ensured a closer comparison between the conditions as all participants were prompted to feel uncertain about at least one personal relationship.

As in Study 3, we predicted that:

*H1: Objects would be more effective as a secure base for those participants who felt high (vs. low) support uncertainty.*

and that:

*H2: Close others would be less effective as a secure base for those participants who felt high (vs. low) support uncertainty.*

As a result of those two changes, we expected that:

*H3: Objects (vs. close others) would be more effective as a secure base for participants experiencing high support uncertainty.*

We also attempted to provide converging evidence by measuring exploration intentions as well as *worldview exploration*, people's interest in considering alternative perspectives, including those that may challenge their own (Routledge & Arndt, 2009). We anticipated similar effects on both outcome measures.

## Method

One-hundred four undergraduates at a large Midwestern university (62 women,  $M_{age} = 19.14$ , 85% White) participated for course credit in a study using the same cover story as Studies 1 and 3.

### Support Uncertainty Manipulation

First, all participants were asked to identify someone they turn to for help and support (i.e., a human attachment figure). Then all participants were asked to think about two experiences when they felt unsure that they could depend on that target to induce feelings of support uncertainty.

Then participants were randomly assigned to think about 3 ways in which that target was either similar to (*high support uncertainty*) or different from (*low support uncertainty*) others with whom participants had close, supportive relationships:

*Think about THREE ways in which [target] is (SIMILAR to/DIFFERENT from) other people you trust. Think about aspects of his or her personality or behavior that you (have/have not) seen before in other trusting relationships you have. (see Appendix H for full instructions)*

### Secure Base Target Manipulation

Next, participants were randomly assigned to either the *close other* or desired *object* secure base conditions used in the previous studies. We modified the instructions slightly to ensure that participants in the *close other* condition did not identify the same target they wrote about for the support uncertainty manipulation.

### Motivation to Explore

Participants then completed the exploration index used in Studies 1 and 3. Once again,



the 18 items formed a reliable composite ( $\alpha = .86$ ,  $M_{grand} = 5.02$ ,  $SD = .78$ ).

### **Worldview Exploration**

Finally, participants completed a measure of worldview exploration validated in prior research (Routledge & Arndt, 2009). Participants were informed that the university was planning a documentary film festival and that we were interested in assessing student interest in six potential films. Then participants were provided with a short description of each film and asked to rate their interest in seeing the film (1 = *Not at all interested*; 7 = *Very interested*) as well as the likelihood that they would see it if were to be screened on campus (1 = *Not at all likely*; 7 = *Very likely*).

Four of the films adopted perspectives contrary to mainstream American culture, including a film about the role of US foreign policy in promoting terrorism, a film about the ways in which China has surpassed the United States in political and economic influence, and films questioning the existence of God and the divine status of Jesus as a historical figure (the remaining two films were filler; see Appendix I). Following prior research, we calculated composite worldview exploration scores by averaging interest in all four worldview challenging films ( $\alpha = .87$ ,  $M_{grand} = 3.51$ ,  $SD = 1.18$ ).

## **Results**

### **Motivation to Explore**

Submitting exploration intention scores to a 2 (support uncertainty: *low* vs. *high*)  $\times$  2 (secure base target: *close other* vs. *object*) ANOVA returned the predicted interaction,  $F(1, 100) = 12.74$ ,  $p = .0005$ ,  $\eta_p^2 = .13$  (*observed power* = .92) but no main effects of support uncertainty,  $F(1, 100) = .15$ ,  $p = .70$ , or secure base condition,  $F(1, 100) = 1.11$ ,  $p = .29$ .

Pair-wise comparisons (Fisher's LSD) by secure base target condition (Figure 4) showed

that for participants reminded of a desired object, interest in exploration was higher for those participants primed with high support uncertainty ( $M = 5.25$ ,  $SD = .65$ ) compared to those primed with low uncertainty ( $M = 4.68$ ,  $SD = .82$ ;  $p = .007$ ). For participants who thought of a close other, those primed with high support uncertainty reported lower exploration intentions ( $M = 4.87$ ,  $SD = .68$ ) than those primed with low uncertainty ( $M = 5.34$ ,  $SD = .78$ ;  $p = .02$ ).

Among participants primed with high support uncertainty, those who thought of an object reported significantly greater interest in exploration than those who were primed with a close other ( $p = .04$ ). For participants who were instead primed with low support uncertainty, those who thought of a close other reported greater motivation to explore than those who thought of an object ( $p = .004$ ).

### **Worldview Exploration**

Submitting worldview exploration scores to the same  $2 \times 2$  ANOVA, we found the predicted interaction,  $F(1, 100) = 16.10$ ,  $p = .0001$ ,  $\eta_p^2 = .16$  (*observed power* = .96) but no main effects of either support uncertainty,  $F(1, 100) = .69$ ,  $p = .40$ , or secure base target condition,  $F(1, 100) = 1.59$ ,  $p = .21$ .

Pair-wise comparisons (Fisher's LSD) and the pattern of means (Figure 5) showed that for participants reminded of a desired object, those primed with high support uncertainty reported higher worldview exploration ( $M = 4.01$ ,  $SD = 1.21$ ) than those primed with low uncertainty ( $M = 3.32$ ,  $SD = .99$ ;  $p = .03$ ). Among participants who thought of a close other, those primed with high support uncertainty reported lower worldview exploration ( $M = 2.87$ ,  $SD = 1.03$ ) than those primed with low support uncertainty ( $M = 3.92$ ,  $SD = .99$ ;  $p = .001$ ).

Among participants primed with high support uncertainty, those who thought of an object reported significantly greater worldview exploration than those who thought of a close other ( $p =$

.0007). For participants who were instead primed with low support uncertainty, those who thought of a close other reported greater worldview exploration than those who instead thought of an object ( $p = .05$ ).

### **Discussion**

The results of Study 4 lend further support to our claim that support uncertainty moderates the extent to which objects serve as a secure base. Conceptually replicating the effects observed in Study 3, we found that under conditions of general (i.e., high) support uncertainty, reminders of a desired object resulted in higher exploration intentions than when participants were primed with only relationship-specific support uncertainty. Additionally we found the opposite pattern for those in the close other condition: increased support uncertainty reduced the effectiveness of these reminders in motivating exploration. These changes were so pronounced that under conditions of high support uncertainty, a reminder of a desired object motivated exploration to a greater extent than a reminder of a close other. This conceptually replicates the effects observed in Studies 2 and 3 by showing that under high support uncertainty, a reminder of a desired object (vs. close other) provides greater feelings of security (Study 2) and results in increased exploration intentions (Study 3).

Thus far, we have relied on participants' idiosyncratic selection of a target attachment object. On the basis of research on the secure base function in close relationships, we would expect that not all objects (just as not all relationship partners) are equally effective as a secure base. In particular, research shows that cognitive appraisals of a relationship partner determine the extent to which they promote exploration. We conducted Study 5 to determine if this process extends to objects.

### **Study 5**

Study 5 provides an initial test of the role of cognitive appraisals of a target secure base object. Based on prior research on interpersonal attachment (reviewed in the Introduction), we expected that objects perceived as dependable (vs. merely positive) should be particularly effective as a secure base. But as we also saw in Studies 2-4, dependability alone will likely only motivate exploration to the extent that individuals are motivated to use objects as a secure base; that is, based on the degree to which they experience support uncertainty.

To test these predictions, we first assessed individual differences in attachment anxiety as an index of support uncertainty. Then ostensibly as part of a consumer attitudes task, participants were provided with a pair of headphones and one of two fabricated reviews for them. These reviews were designed to suggest either that those headphones were particularly dependable or impressive. Finally, participants completed assessments of their interest in exploration and their curiosity: a willingness to pursue challenging, growth-oriented experiences.

We predicted that:

*H1: More (vs. less) anxious participants would be more motivated to explore by the presence of a dependable secure base object.*

As a result, we expected that:

*H2: Participants high in attachment anxiety would be more motivated to explore by a dependable (vs. impressive) object.*

As in Study 2, we attempted to provide converging evidence for these predictions by testing whether attachment avoidance also had a moderating effect on the relationship between appraisals and motivation to explore. On the basis of our theorizing we expected that support uncertainty specifically (reflected by attachment anxiety) would moderate how effective each object framing would be in motivating exploration, but that:

*H3: Object appraisals would not show the same pattern of interaction with attachment avoidance.*

### **Method**

One-hundred six undergraduates at a large Midwestern university (47 women,  $M_{age} = 19.29$ , 76% White) participated for course credit in a study ostensibly researching connections between personality and consumer attitudes.

#### **Attachment Anxiety and Avoidance**

As in Study 2, individual differences in attachment anxiety and avoidance were assessed using the ECR-RS. Measures of anxiety ( $\alpha_{range} = .84-.90$ ) and avoidance ( $\alpha_{range} = .80-.90$ ) were highly reliable across the relationship types and we calculated composite scores for anxiety ( $\alpha = .58$ ,  $M_{grand} = 1.90$ ,  $SD = .70$ ) and avoidance ( $\alpha = .59$ ,  $M_{grand} = 2.46$ ,  $SD = .81$ ).

#### **Object Feature Manipulation**

Then as part of a consumer attitude task, participants were asked to evaluate a pair of noise canceling headphones (Sony MDR-NC60 headphones). As part of the task, participants were randomly assigned to receive one of two reviews, ostensibly from a popular online retail website (Appendix J). For participants assigned to the *dependable* condition, the review described the headphones as particularly durable and well-built. However, for participants assigned to the *impressive* condition, the headphones were described as often impressing other people and getting their attention. After reading the review, participants were instructed to take a minute to inspect the headphones and try them on before completing some filler ratings of the headphones included to bolster the cover story.

#### **Motivation to Explore**

To assess exploration intentions, participants first completed the exploration index used

in the previous studies. The 18 items formed a reliable composite ( $\alpha = .86$ ,  $M_{grand} = 5.21$ ,  $SD = .77$ ).

### **Curiosity**

Finally, participants completed the Curiosity and Exploration Index (Kashdan et al., 2009), a 10-item assessment of participants' interest in new and challenging experiences. Participants rated their agreement (1 = *Strongly disagree*; 7 = *Strongly agree*) with statements assessing their curiosity (e.g., "I view challenging situations as an opportunity to grow and learn"; "I frequently seek out opportunities to challenge myself and grow as a person"). The items (Appendix K) formed a reliable composite index of curiosity ( $\alpha = .90$ ,  $M_{grand} = 5.03$ ,  $SD = 1.02$ ).

## **Results**

### **Motivation to Explore**

Motivation to explore scores were regressed onto attachment anxiety (mean-centered), object feature condition (dummy-coded: 0 = *impressive*, 1 = *dependable*), and their interaction. This model returned a significant main effect of anxiety,  $\beta = -.33$ ,  $SE = .15$ ,  $t(102) = 2.39$ ,  $p = .01$  (*observed power* = .89), and a significant interaction between anxiety and object feature condition,  $\beta = .64$ ,  $SE = .21$ ,  $t(102) = 3.43$ ,  $p < .001$  (*observed power* = .99). At mean levels of attachment anxiety, there was no main effect of object feature condition ( $\beta = -.07$ ,  $SE = .14$ ,  $t(102) = .75$ ,  $p = .46$ ).

Probing this interaction by object feature condition (Figure 6), we found that attachment anxiety predicted more interest in exploration for participants primed to think of the headphones as dependable ( $\beta = .33$ ,  $SE = .14$ ,  $t(51) = 2.46$ ,  $p = .01$ ) but lower exploration intentions for participants in the impressive condition ( $\beta = -.32$ ,  $SE = .15$ ,  $t(51) = 2.39$ ,  $p = .02$ ).

We then tested the simple effects of object feature condition at both high and low levels of attachment anxiety. For participants at high (+1 SD) in attachment anxiety, those participants primed to think of the headphones as dependable reported higher exploration intentions than those in the impressive condition ( $\beta = .29$ ,  $SE = .22$ ,  $t(102) = 2.06$ ,  $p = .04$ ). However, at low (-1 SD) attachment anxiety, those who were primed to think of the headphones as impressive reported more interest in exploration than those who were primed to think of the headphones as dependable ( $\beta = .43$ ,  $SE = .21$ ,  $t(102) = 3.09$ ,  $p = .002$ ).

Controlling for the effects of attachment avoidance ( $\beta = -.15$ ,  $SE = .10$ ,  $t(101) = 1.44$ ,  $p = .15$ ), the interaction between object feature condition and attachment anxiety remained significant ( $p = .002$ ), though the main effect of anxiety became non-significant ( $p = .11$ ). Controlling for anxiety and its interaction with object feature condition, there was no evidence for an interaction between avoidance and object feature condition ( $\beta = .06$ ,  $SE = .21$ ,  $t(100) = .50$ ,  $p = .62$ ).<sup>6</sup>

### **Curiosity**

Curiosity scores were also regressed onto attachment anxiety (mean-centered), object feature condition (dummy-coded), and their interaction. We found a significant main effect of anxiety,  $\beta = -.38$ ,  $SE = .19$ ,  $t(102) = 2.72$ ,  $p = .007$  (*observed power* = .86), and a significant interaction between anxiety and object feature condition,  $\beta = .62$ ,  $SE = .26$ ,  $t(102) = 3.33$ ,  $p = .001$  (*observed power* = .99). There was no main effect of object feature condition at mean levels of attachment anxiety ( $\beta = -.10$ ,  $SE = .18$ ,  $t(102) = 1.12$ ,  $p = .26$ ).

Probing this interaction by object feature condition (Figure 7), we found that attachment anxiety predicted greater curiosity for those participants primed to think of the headphones as dependable ( $\beta = .27$ ,  $SE = .17$ ,  $t(51) = 2.02$ ,  $p = .05$ ) but instead predicted decreased curiosity for

participants in the impressive condition ( $\beta = -.34$ ,  $SE = .20$ ,  $t(51) = 2.62$ ,  $p = .01$ ).

For participants high (+1 SD) in attachment anxiety, those primed to think of the headphones as dependable reported marginally greater curiosity than those in the impressive condition ( $\beta = .25$ ,  $SE = .27$ ,  $t(102) = 1.73$ ,  $p = .09$ ). For participants at low (-1 SD) attachment anxiety, those primed to appraise the headphones as impressive felt significantly more curious than those who were primed to think of the headphones as dependable ( $\beta = -.46$ ,  $SE = .27$ ,  $t(102) = 3.25$ ,  $p = .002$ ).

Controlling for the effects of attachment avoidance ( $\beta = -.05$ ,  $SE = .13$ ,  $t(101) = .48$ ,  $p = .64$ ), the interaction between object feature condition and attachment anxiety remained significant ( $p = .001$ ), as did the main effect of anxiety ( $p = .02$ ). Controlling for anxiety and its interaction with condition, there was no evidence for an interaction between avoidance and object feature condition ( $\beta = .15$ ,  $SE = .26$ ,  $t(100) = 1.10$ ,  $p = .27$ ).<sup>7</sup>

### **Discussion**

The results of Study 5 demonstrate the important role of cognitive appraisals in determining the extent to which a target object serves as a secure base. Participants primed to see the headphones as impressive showed the well-established negative association between support uncertainty and exploration intentions. However, for participants provided with an ostensibly dependable object, this association became positive (and significant) and this effect was so pronounced that high anxiety individuals showed greater motivation to explore when provided with a dependable (vs. impressive) target object. Following the results of Studies 1-4, we found that merely seeing a nearby object as dependable (vs. impressive) did not simply increase exploration intentions: in the presence of a dependable (and not merely positive) object, the more



participants felt uncertain about their relationships, the more that object served as a secure base for exploration.

We also observed that the dependable headphones were less effective at motivating exploration compared to the impressive headphones for those participants who were low in anxiety. One possibility is that the impressive headphones seemed like an effective way to establish connections with other people, rather than as a source of security on their own. Future research would be needed to explore how people who are confident in their social relations may be able to use socially impressive objects as a secure base by proxy.

### **General Discussion**

Across five studies, we found that objects can effectively serve as a secure base, though only under certain conditions. Specifically, we found that when people were primed with support uncertainty (vs. certainty) by reading about uncertain hypothetical relationships, objects and close others were equally effective at buffering the negative effects of support uncertainty on motivation to explore (Study 1). As participants felt greater support uncertainty about their own relationships, a reminder of a desired object became more effective than thinking of a close other for providing feelings of security (Study 2) and promoting exploration in a variety of forms (Studies 3 and 4). Taken together, these studies address the question of when objects are likely to serve as a secure base by demonstrating that support uncertainty determines the extent to which objects (and close others) can serve as a secure base.

Finally, we went further by testing whether cognitive appraisals of an object interact with support uncertainty to determine the relative effectiveness of an object as a secure base. While prior research on attachment has consistently demonstrated that increased support uncertainty (i.e., anxiety) reduces motivation to explore (an effect we also observed in Study 1), we found

that individuals who were presented with an ostensibly dependable object were in fact *more* motivated to explore to the extent that they felt uncertain about the availability of support in their close relationships. These data show that cognitive appraisals of objects interact with support uncertainty to determine the effectiveness of a target object as a secure base.

### **Limitations and Future Directions**

While these studies provide new insight into the ways in which objects meet people's needs for support, they also suggest directions for further research.

**Duration.** In all of our studies, secure base effectiveness was assessed immediately following a manipulation. As a result, the long-term effectiveness of objects as a secure base remains an open question.

On the one hand, the long-term effectiveness of objects as a secure base seems unlikely. Objects do not possess the rich capacities for agency and subjectivity that human caregivers do, and as a result, objects are likely to be far less adaptive and adaptable sources of security. A new car might be particularly good at eliciting positive, growth-promoting emotional experiences at first, but these benefits are likely to taper off quickly as the car breaks down (changing its appraisals), newer models are released, or it is reduced to the status of a mere tool for everyday goals.

However, our studies suggest that for individuals with particularly uncertain interpersonal relations, cherished personal objects may be able to provide sustained support for growth. Because support uncertainty increases the effectiveness of objects as a secure base, individuals who chronically experience uncertainty about the supportiveness of their relationship partners may find objects to be a useful long-term basis for growth. Determining when the benefits of objects can be lasting presents an important direction for future research.

**Consequences.** Though objects can sometimes effectively serve as a secure base, our studies do not shed light on the implications of using objects in this capacity. Even if objects offer a means of sustaining growth, it is likely that this use of objects has many consequences for the individual and her relationships.

Individuals who tend to use objects in as a source of support may consequently endorse more materialistic values, which lead to lower life satisfaction, increased anxiety, and other negative outcomes (Kasser et al., 2014). Additionally, the pursuit of support through objects may motivate increased consumption, particularly toward objects that are appraised as dependable.

The use of objects as a source of support may also undermine relationship satisfaction. By preventing opportunities for partners to support one another, objects may undermine a crucial prerequisite for trust, intimacy, and commitment (Carnelley, Pietromonaco, & Jaffe, 1996). By acknowledging support-seeking toward objects, researchers can begin to explore the consequences of this behavior for close relationships.

**Scope.** Despite the range of outcomes we employed in these studies, felt security and interest in exploration reflect only a few dimensions of personal growth. Future research should explore whether objects promote other indices of growth, such as reduced ego defensiveness (Park, Bauer, & Arbuckle, 2009), self-actualization (Bauer, Schwab, & McAdams, 2011), the development of positive character traits (e.g., forgiveness and humility; Dwiwardini et al., 2014) and resilience (Blaustein & Kinniburgh, 2012).

While we found that objects fostered security and an interest in exploration, it seems unlikely that objects could promote other dimensions of growth: While the inertness of objects can afford the individual a sense of control and agency, this passivity seems antithetical to the development of traits that require mutual engagement and understanding. For example, turning to

a cell phone for a sense of security may provide a sense of confidence, but it seems unlikely to provide the experiences of perspective-taking and care needed for ego development (Sprinthall, 1994). Future research is needed to determine exactly which limits exist for the use of objects as a secure base for growth.

Additionally, while we found that objects serve as a secure base when participants experienced support uncertainty, we did not test the possibility that objects may also serve as a safe haven. This possibility has important theoretical and practical implications: when individuals experience distress they may seek proximity toward objects as a source of solace (rather than as a foundation for personal growth). The abstract desire to seek proximity with objects as a means of coping with stress seems representative of a host of problematic behaviors, including binge eating (Heatherton & Baumeister, 1991), “retail therapy” (i.e., shopping to improve mood; Atalay & Meloy, 2011), and drug addiction. While there are well-known biological bases for many forms of addiction, it is possible that persistent proximity seeking may itself serve a defensive role by allowing an individual to cope with deficits to social support. By acknowledging the extent to which people seek compensatory support in objects, researchers can begin to explore the ways in which certain objects take on immense, and occasionally problematic, significance.

Finally, our scope was limited merely to the use of objects as a compensatory source of security. This leaves important questions about the generalizability of these effects to other human (e.g., baristas, bartenders) and non-human (e.g., God, pets) sources of perceived emotional support. Because people turn to these sources as a means of compensating for insufficient interpersonal support, it is possible that the same effects we observed for material objects would hold for pets, God, fictional characters and so on. However, future research is

needed to address this possibility.

**Object features.** Our assumption, following prior theorizing, was that material objects provide individuals with feelings of security because they are completely controllable; however, this process was not directly tested in these studies. This issue is practically important as people's relations with objects have changed dramatically in recent history: As technology has developed, objects have become increasingly agentic, automatically accomplishing certain tasks to save users time and using language to communicate with users (e.g., Siri).

On the one hand, these changes seem antithetical to the use of objects as a source of security. A target object that speaks and behaves on its own lacks the complete passivity (and controllability) that individuals presumably once sought in blankets and teddy bears. As objects confront users with more complexity, those individuals may lose a sense of easy and absolute control that provides security and reassurance.

However, as objects become more agentic it is possible that they may provide security by more closely approximating interpersonal relationships, rather than through their passivity. Prior research finds that individuals sometimes see objects as possessing human-like capacities for thinking and feeling when they desire social interaction (Epley, Akalis, Waytz, & Cacioppo, 2008). It is therefore possible that individuals desiring social support may seek objects that seem capable of behavior that is more analogous to interpersonal support. For example, a phone that automatically adjusts to its user may provide a sense of security not by its passivity, but by its ostensible capacity to understand and accept its user. This possibility seems particularly likely for media objects, such as films and video games, in which characters possessed of some measure of humanity interact with an individual in ways that may provide a sense that someone is actually there for the user.

If people sometimes seek support from complex, human-like objects, then support uncertainty may not be the only factor that increases the effectiveness of objects as a secure base. In fact, a particularly complex object that provides security by approximating interpersonal interaction may become less reassuring if support uncertainty extends from human to human-like sources of support. One alternative (albeit speculative) possibility is that individuals will seek support from human-like objects in response to interpersonal rejection, as these objects are not similarly capable of withholding support. With the widespread adoption of more agentic and interactive technologies, the processes underlying support-seeking toward objects merits further research.

**Environment.** While our studies found consistent support for our predictions, it is possible that the use of objects as a secure base is a relatively culturally isolated phenomenon. In particular, all of our studies were conducted with adults in an extremely individualistic and consumer-oriented cultural environment (Markus & Kitayama, 2010). On the one hand, norms of independence may encourage individuals to meet needs for support without relying on others: by turning to objects rather than close others for support, individuals can maintain feelings of self-reliance (however illusory). It may be that in less independence-oriented cultural settings, individuals may respond to support uncertainty by attempting to restore confidence in their relationships (e.g., by rebuilding trust), rather than pursuing compensatory support-seeking strategies.

But even if individuals in other cultural environments engage in compensatory support-seeking, it is likely that objects would not be a primary source for such compensation. Consumer culture entrains individuals to place particular value on things and their acquisition (Kasser, 2011a) and this emphasis may channel compensatory support-seeking toward objects rather than,

for example, God or place. Consistent with this claim, research shows that the use of security objects for children is a rare phenomenon outside of Western, capitalist countries (e.g., Morelli et al., 1992; Rogoff, 2003). While this is often assumed to be a form of independence training (Morelli & Rothbaum, 2007), it is also a form of socialization into a cultural environment in which security is to be found (at least occasionally) in things. While our studies cannot speak to the possibility of cultural variation in the use of objects as a secure base, this variation is an important direction for future research.

In addition to cultural factors, the role of objects as a secure base may also depend upon more proximal aspects of the environment. Research shows, for example, that individuals who were asked to imagine relocating frequently felt more uncertain about their relationships and were more motivated to form social bonds compared to participants who were instead primed with residential stability (Oishi et al., 2013). Because relocating to a new place is a source of considerable support uncertainty, it is possible that this everyday activity subtly motivates compensatory support-seeking toward objects as well.

Finally, the context of a close relationship likely also contributes to feelings of support uncertainty. Long-distance relationships not only make support provision much more difficult, but also introduce mediated forms of communication that introduce ambiguity by reducing information about a communicator (Kiesler, Siegel, & McGuire, 1984). A message like “you’ll be fine” can be reassuring when paired with the right body language but can be dismissive otherwise. Text-only communication (e.g., text messaging, Facebook) makes the determination of the meaning and intent of such statements more difficult and this may introduce doubt that subtly erodes confidence in a partner’s supportiveness. Future research can further investigate ways in which the context of a close relationship incidentally cues feelings of support uncertainty

that motivate compensatory support-seeking efforts.

### **Theoretical Implications**

Our research has important implications for how psychologists understand attachment and support-seeking. Primarily, these studies provide further evidence that individuals can gain some established benefits of social support through their (real or imagined) interactions with non-human targets, particularly when support seems lacking in the social world.

Growing evidence of non-human support demonstrates a pressing need for attachment theorists to broaden the scope of the theory to accommodate the complex realities of support-seeking behavior. Stringent (but widely held) assumptions about the uniqueness of attachment bonds limit the scope of attachment theory, often to four (or fewer) relationships (typically mom, dad, best friend, and romantic partner; Fraley et al., 2011; Trinke & Bartholomew, 1997). Not only does this approach overlook other forms of interpersonal social support (e.g., support-seeking from strangers; Cowen, 1982), but it also glosses over the manifold ways that individuals find and maintain security through non-human sources.

This is not to say that interpersonal attachment and non-human support are identical, but the similarities and differences between these forms of support remain relatively unexplored. As noted in the introduction, work outlining the parallels between non-human support-seeking and human attachments finds that many traditional attachment processes occur in an analogous way toward non-human targets (for additional support, see Zilcha-Mano et al., 2011; Scannell & Gifford, 2014).

But given the clear differences between human and non-human targets, there are likely discontinuities as well. Our studies provide initial evidence that the compensatory feelings of support provided by objects operate very differently from those provided by relationships:



objects were more (vs. less) effective than close others under high (vs. low) support uncertainty. Human others (unlike objects) are capable of a wide range of behaviors, including capacities for agency, empathy, and language that may make them particularly effective at providing individuals with the support they need to thrive, at least in most conditions. For example, while interpersonal support generally promotes well-being, recent evidence finds that people who are highly attached to their pets showed poorer mental health outcomes (Peacock et al., 2013). Further investigation is necessary to understand when non-human support is maladaptive, and in what other ways it differs from close relationships.

The current research also has important implications for the understanding of materialism. Although the negative consequences of materialism are well-established, relatively little research has explored why individuals invest so much significance in material objects. One explanation focuses on clear cultural explanations for materialism (e.g., advertising; Schor, 2004), and related research finds that materialistic values increase as a function of dispositional (Rindfleisch, Burroughs, & Wong, 2009) or situational (Kasser & Sheldon, 2000) death anxiety. From this perspective, desiring material objects offers one way of ascribing to a dominant cultural worldview that offers protection against the fear of mortality (Solomon, Greenberg, & Pyszczynski, 2004). But in addition to serving as an index of how well an individual meets the demands of a cultural worldview, material objects may take on undue significance for individuals because of their utility as a source of security (a process that is distinct from worldview defense; Hart, Shaver, & Goldenberg, 2005). For example, the desire for luxury clothing may stem from a desire for social status to manage terror about death or because a particular brand helps an individual to feel secure when support is lacking. Future research is needed to explore when materialism is a function of adherence to cultural norms and when it stems from a need for

compensatory support specifically.

## **Conclusions**

The current research found that objects effectively serve as a secure base when individuals experience support uncertainty. These studies provide further evidence for the importance of non-human support, and they shed light on the situations in which this support is likely to be effective in promoting growth.

These findings have important implications for individual, relational, and social well-being. At the individual level, these studies support the broad notion that individuals are resourceful in meeting their needs for support. Even when faced with support uncertainty, individuals found ways to use objects to maintain motives for personal growth.

But even if objects can help individuals to maintain their own well-being when the social environment seems lacking in support, they likely do so at a cost. Individuals who turn to material objects for support may ultimately prevent the development of trust and intimacy in their relationships. While support uncertainty is unpleasant, it might motivate relationship partners to take steps aimed at re-establishing trust. Compensatory efforts may serve as a palliative with the unintended consequence of undermining this motivation to improve the relationship.

More broadly, the use of material objects as sources of support may have unrecognized, but important implications for overconsumption and environmental destruction. Consumption that is motivated by specific practical aims (e.g., needing a snow shovel) has a set goal that, once achieved, eliminates the need to consume. The need for social support, however, is enduring and arguably innate. If individuals buy objects in order to secure some of the benefits of supportive relationships, they may find themselves in an unending pursuit: no one product is likely to

provide the lasting care and support that individuals need to thrive. While objects may be useful as a source of support, the costs of this use for interpersonal relationships and for society as a whole may far outweigh its benefits for the individual.

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## Footnotes

1. Cultural psychological critiques of attachment theory (Morelli & Rothbaum, 2007; Rothbaum et al., 2002) have directly challenged the emphasis on, and presumed intrinsic value of, individual exploration and personal growth. This emphasis is in part a reflection of attachment theory's origin in a Western, individualistic culture, and acknowledging this bias is crucial for depathologizing alternative patterns of attachment and child-rearing. For the purposes of this paper, we do not endorse the *prescriptive* claim that pursuing personal growth is inherently healthy or that prioritizing other goals over personal growth is somehow pathological. Rather we base this project on the *descriptive* (and well-supported) claim that personal growth depends upon the availability of social support.
2. Evidence regarding the positive benefits of pet attachment is somewhat mixed. For example, Peacock, Chur-Hansen, and Winefield (2012) found that individuals with extremely strong attachment bonds to pets showed poorer mental health outcomes. However, other research finds no association between pet ownership and well-being (Wells & Rodi, 2000). Determining when pet attachment offers psychological benefits and when it does not is an important question, though outside the scope of this project.
3. Due to experimenter oversight, ethnicity and age information was not collected for this sample.
4. Participants in the personal goal writing prompt condition generated a variety of goals, most of which were not about acquiring a particular object. For example, people described career goals (e.g. “To make it in the animation and comics industry as a visual storyteller”, “I want to obtain a PharmD degree and become a licensed pharmacist”), relational goals (e.g., “Vengeance. I wish to see my daughter’s boyfriend in prison for life”; “I want to be able to support my family”), and

more idiosyncratic goals (e.g., “I would like to try making soap and canning”). Only one person in the goal condition ( $n = 74$ ) explicitly mentioned obtaining an object (“buy a new car”) and three mentioned buying land/property (“I wish to get a house”), and all results are consistent with or without the inclusion of these four participants.

5. Additionally, there were no three-way interactions between anxiety, avoidance, and either the goal condition ( $\beta = -.11$ ,  $SE = .09$ ,  $t(196) = 1.28$ ,  $p = .20$ ) or object condition ( $\beta = .01$ ,  $SE = .10$ ,  $t(196) = .20$ ,  $p = .84$ ).

6. There was no evidence for an interaction between anxiety and avoidance ( $\beta = -.04$ ,  $SE = .13$ ,  $t(100) = .47$ ,  $p = .64$ ). We also tested the possibility of a three-way interaction between condition, attachment anxiety, and attachment avoidance. This effect was marginally significant,  $\beta = -.30$ ,  $SE = .27$ ,  $t(98) = 1.66$ ,  $p = .10$ . This provided some evidence that the interaction between anxiety and avoidance differed by object feature condition, however this interaction was not significant in either the impressive ( $p = .45$ ) or dependable ( $p = .13$ ) conditions, so the interaction is not interpretable. More importantly, we found that even after controlling for this potential three-way interaction, the interaction between condition and attachment anxiety remained significant,  $\beta = .69$ ,  $SE = .23$ ,  $t(98) = 2.73$ ,  $p = .007$ .

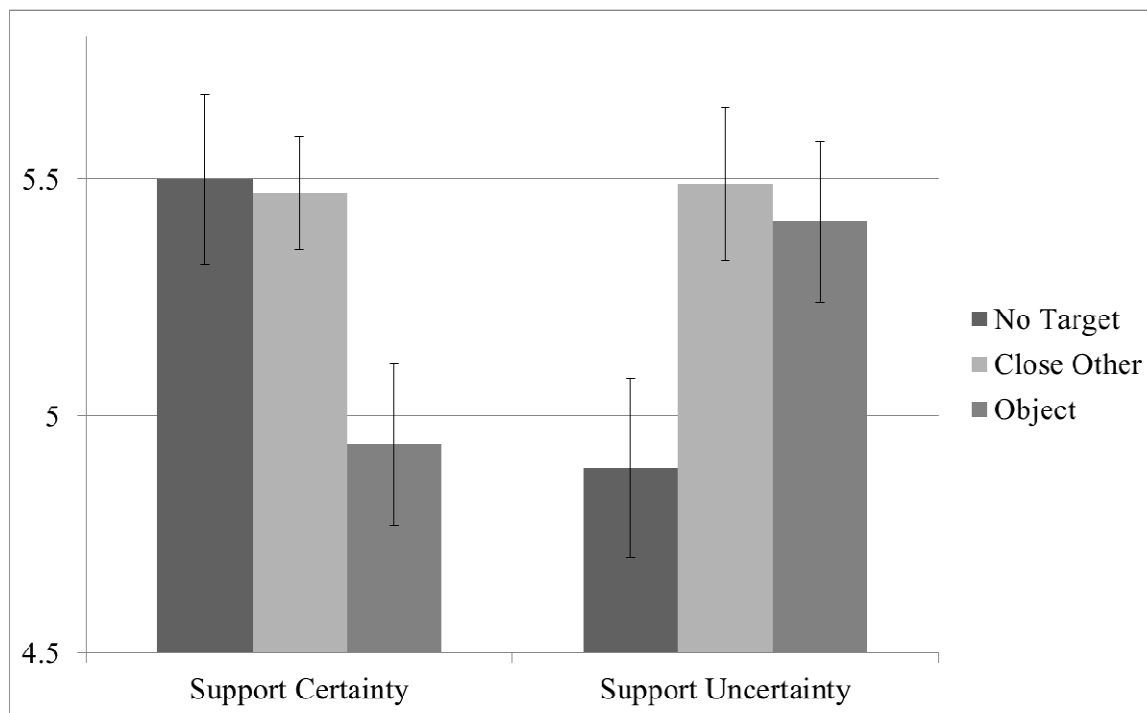
7. There was no evidence for an interaction between anxiety and avoidance ( $\beta = .06$ ,  $SE = .17$ ,  $t(100) = .72$ ,  $p = .47$ ). Testing a three-way interaction between condition, attachment anxiety, and attachment avoidance returned a significant interaction,  $\beta = -.51$ ,  $SE = .34$ ,  $t(98) = 2.06$ ,  $p = .04$ , demonstrating that the interaction between anxiety and avoidance differed by object feature condition. For participants in the impressive condition, there was two-way interaction between anxiety and avoidance,  $\beta = .30$ ,  $SE = .22$ ,  $t(49) = 2.02$ ,  $p = .05$ . This interaction shows that the negative slope of attachment anxiety on curiosity in the impressive condition was higher for



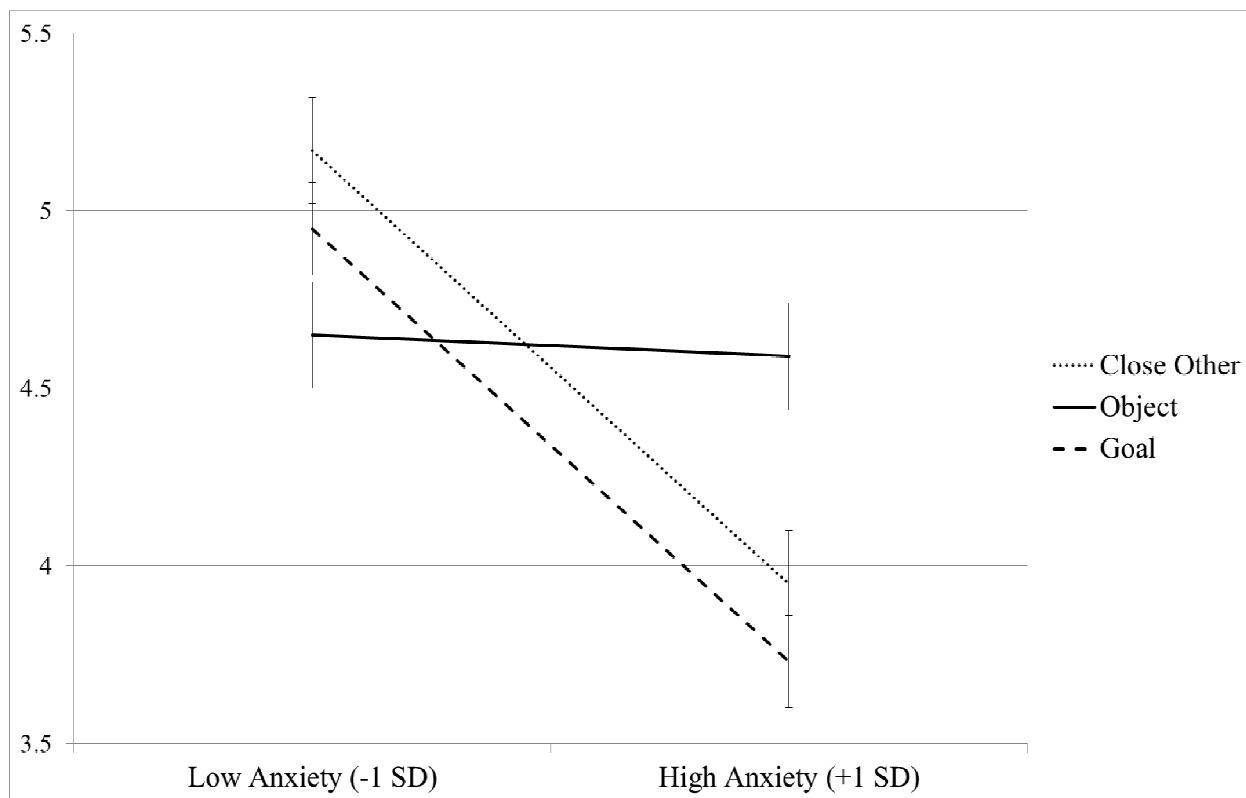
those relatively low in avoidance (and that this slope approached zero to the extent that individuals were more avoidant). However, this interaction was not significant for those in the dependable object feature condition ( $p = .33$ ). We found that even after controlling for this three-way interaction, the interaction between condition and attachment anxiety remained significant,  $\beta = .50$ ,  $SE = .29$ ,  $t(98) = 2.34$ ,  $p = .02$ .

**Figure 1**

Motivation to explore as a function of support prime and secure base target condition (*Study 1*)



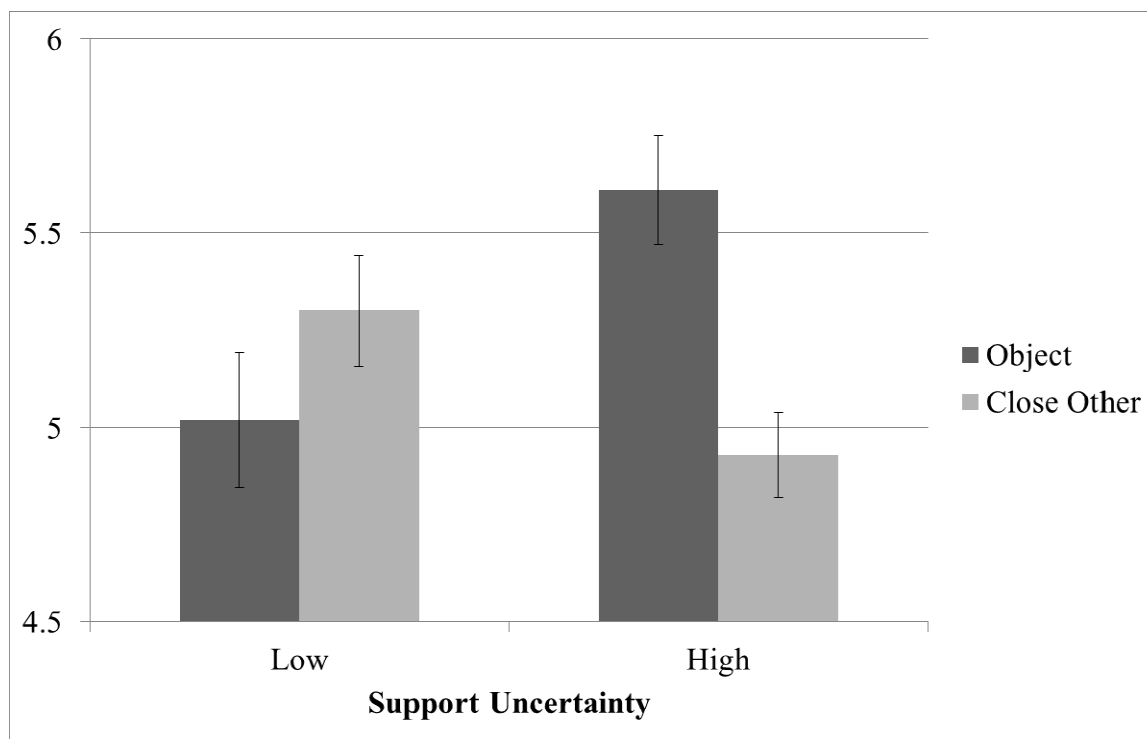
*Note:* Scale ranged from 1-7; higher scores indicate greater motivation to explore.

**Figure 2**Felt security as a function of attachment anxiety and secure base target condition (*Study 2*)

*Note:* Scale ranged from 1-6; higher scores indicate greater felt security.

**Figure 3**

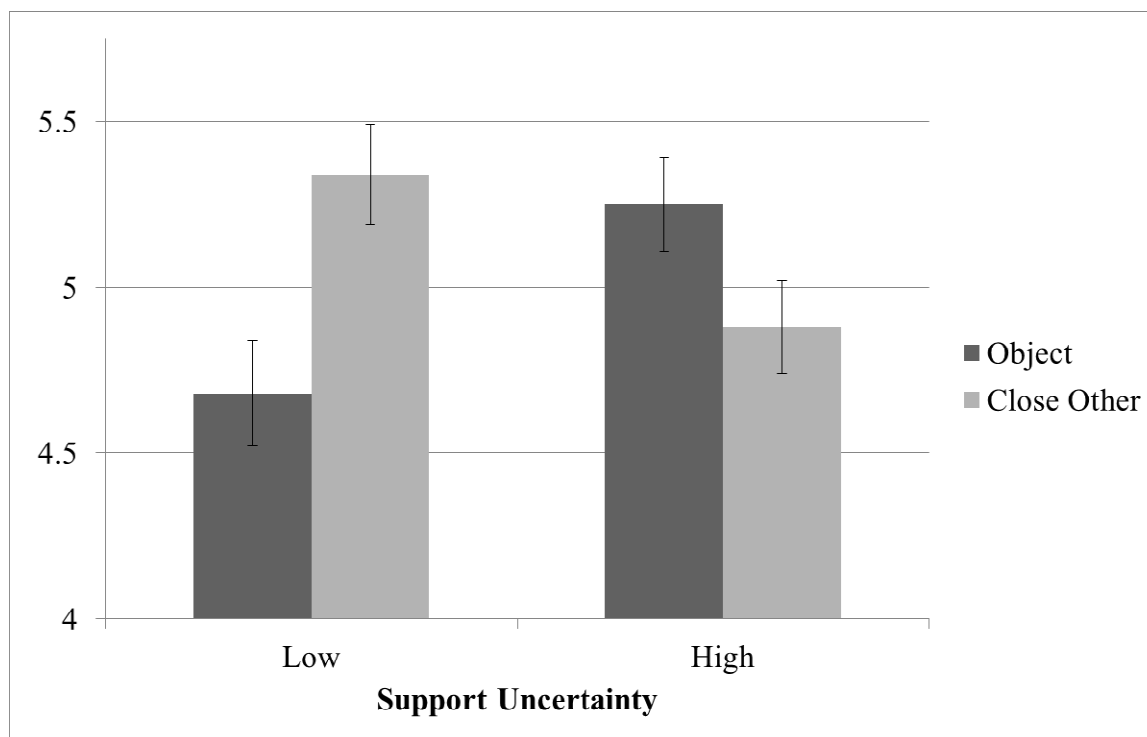
Motivation to explore as a function of support uncertainty and secure base target condition (*Study 3*)



*Note:* Scale ranged from 1-7; higher scores indicate greater motivation to explore.

**Figure 4**

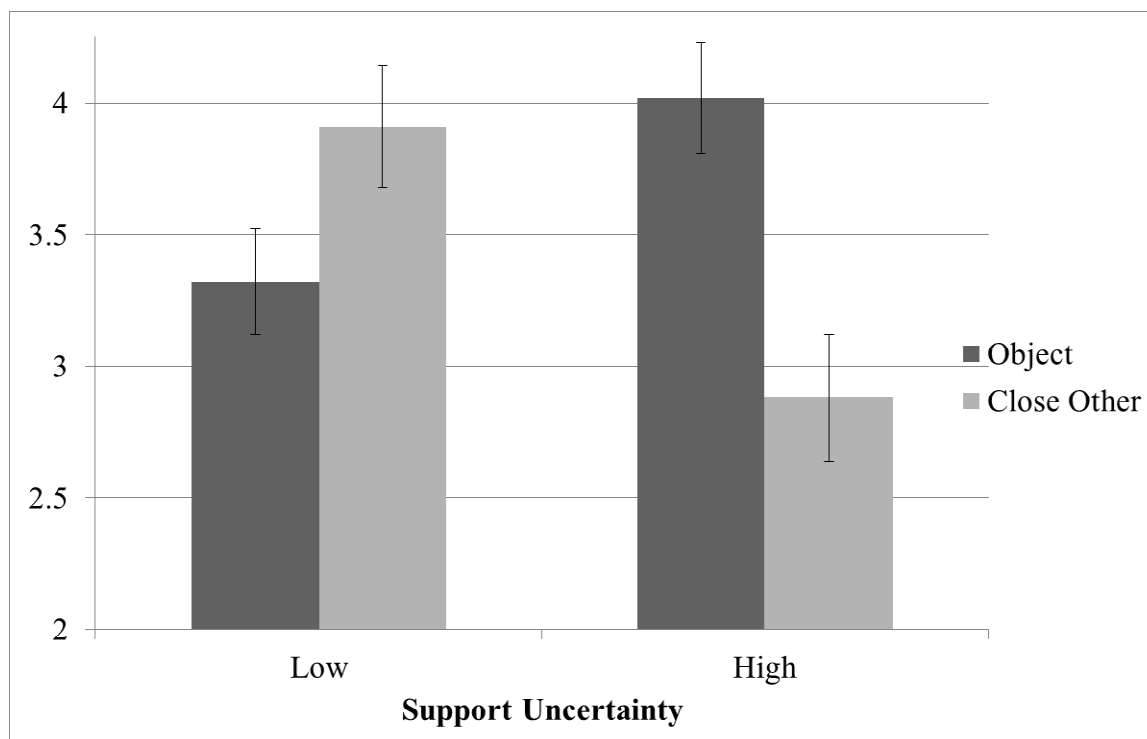
Motivation to explore as a function of support uncertainty and secure base target condition (*Study 4*)



*Note:* Scale ranged from 1-7; higher scores indicate greater motivation to explore.

**Figure 5**

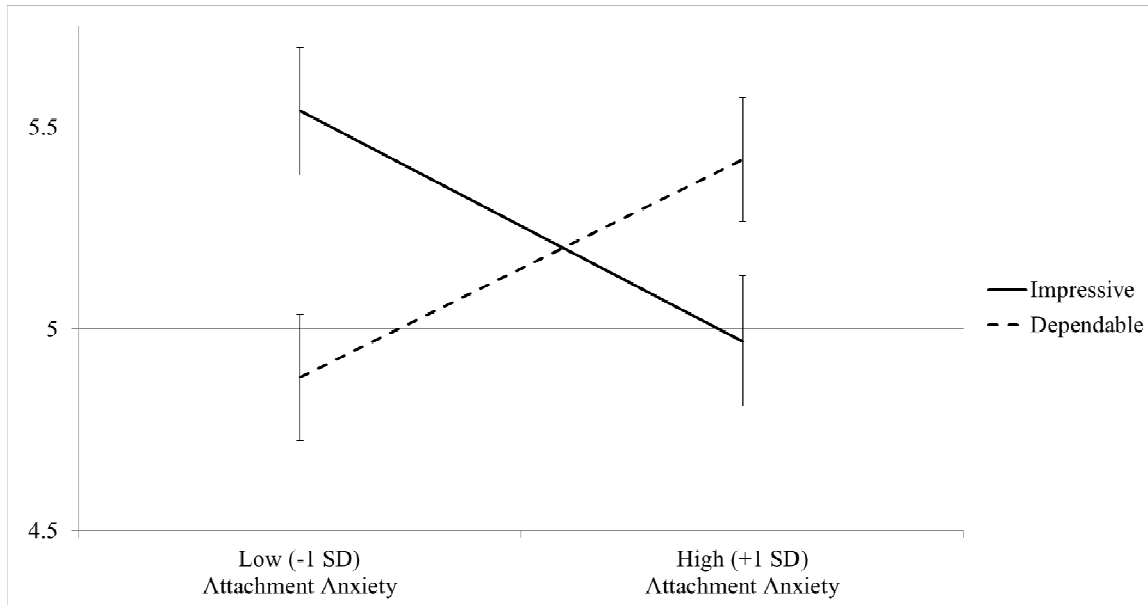
Worldview exploration as a function of support uncertainty and secure base target condition  
(Study 4)



*Note:* Scale ranged from 1-7; higher scores indicate greater worldview exploration.

**Figure 6**

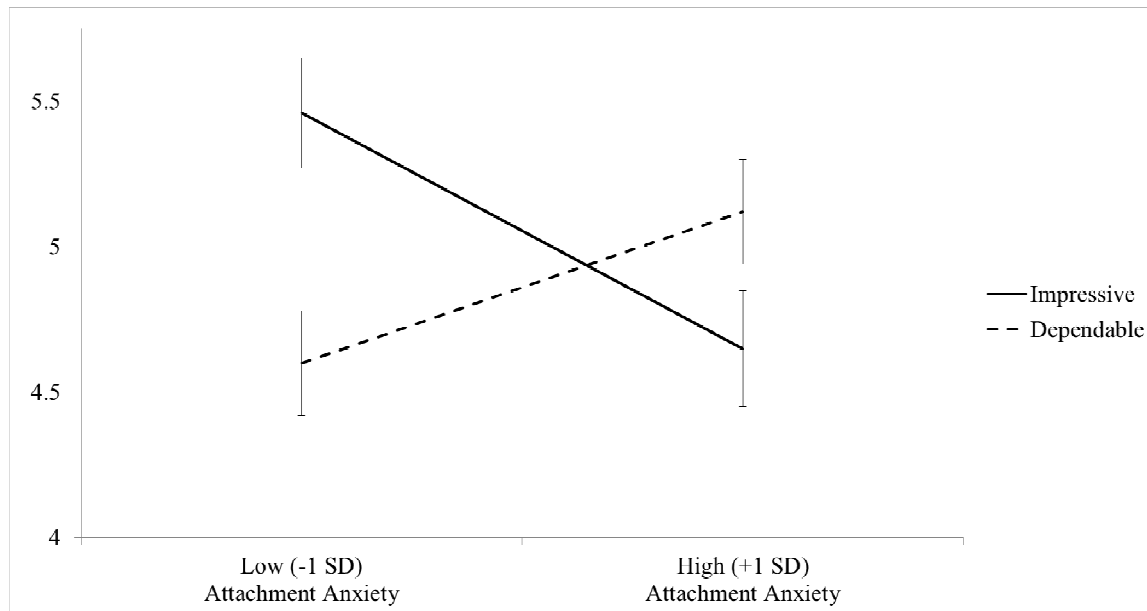
Motivation to explore as a function of attachment anxiety and object feature condition (*Study 5*)



*Note:* Scale ranged from 1-7; higher scores indicate greater motivation to explore.

**Figure 7**

Curiosity as a function of attachment anxiety and object feature condition (Study 5)



*Note:* Scale ranged from 1-7; higher scores indicate greater curiosity.



## Appendix A

**Support manipulation (*Study 1*)**

## Memory Task

Become as familiar as possible with the following sentences. Read through the sentences until instructed to stop. You may begin now.

*Support Uncertainty*

1. Zach arranged the chairs neatly around the table.
2. John is unsure how his girlfriend will respond to his attempts at intimacy.
3. Rachel has a hard time trusting other people.
4. Ellen is constantly worried that her boyfriend will leave her.
5. There are stamps in the desk drawer.
6. Christina is not sure she can depend on her friends.
7. Matt ate the leftover pizza for lunch yesterday.
8. Michelle feels like her parents never get as close as she would like.
9. Steven will always remember the first time he tried tofu.
10. Tony's wife Samantha is never around when he needs her.





*Support Certainty*

1. John and Betty trust each other completely.
2. The store was bustling with activity until closing time.
3. Fred is rarely anxious that his girlfriend will leave him.
4. Jean comforted her child.
5. The chairs were ordered neatly around the table.
6. Kris' boyfriend asked how her day went.
7. Sylvia and her partner planned to spend their holidays together.

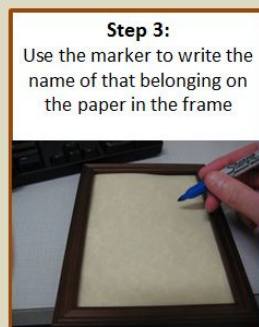
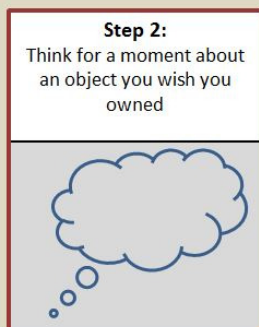
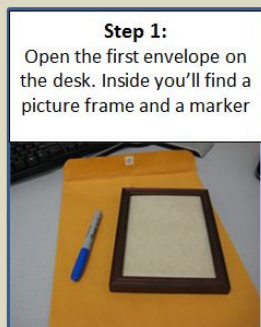
8. The new couch was blue and white.
9. Ellen and her boyfriend walked down the beach hand in hand.
10. Tom felt comfortable sharing his feelings with his wife.

## Appendix B

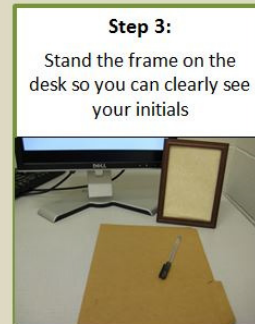
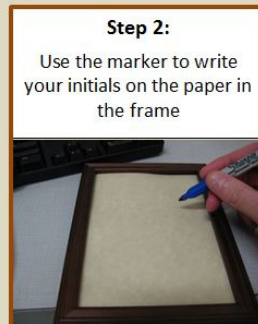
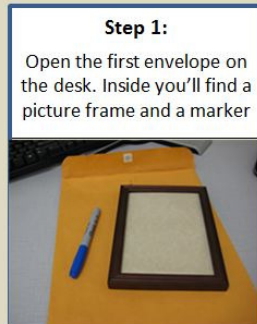
**Secure Base Target Instructions (Studies 1, 3, and 4)***Close other*

<p><b>Step 1:</b> Open the first envelope on the desk. Inside you'll find a picture frame and a marker</p> 	<p><b>Step 2:</b> Think for a moment about your closest friend or family member</p> 	<p><b>Step 3:</b> Use the marker to write the name of that person on the paper in the frame</p> 	<p><b>Step 4:</b> Stand the frame on the desk so you can clearly see the name of that person</p> 
--	---	--	--

**....Once you've completed all four steps, click Continue to begin the next part.**

*Object*

....Once you've completed all four steps,  
click Continue to begin the next part.

*No Target*

....Once you've completed all three steps, click Continue to begin the next part.

## Appendix C

**Motivation to Explore (Studies 1, 3, 4, and 5)**

Please rate how much you agree or disagree with each statement by circling a number from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). Your answers are recorded anonymously, so please give your honest response.

	<b>Strongly Disagree</b>							<b>Strongly Agree</b>
<b>1. I would like to take a class that is unrelated to my major just because it interests me.</b>	1	2	3	4	5	6	7	
<b>2. I would like to try bungee jumping, skydiving, or other adventurous activities.</b>	1	2	3	4	5	6	7	
<b>3. If I had the time and money, I would like to travel overseas this summer.</b>	1	2	3	4	5	6	7	
<b>4. I would like to explore someplace that I have never been before.</b>	1	2	3	4	5	6	7	
<b>5. I would like to have several friends who are very different from each other.</b>	1	2	3	4	5	6	7	
<b>6. I would like to spend a semester studying abroad.</b>	1	2	3	4	5	6	7	
<b>7. I would like a job that was unusual and different.</b>	1	2	3	4	5	6	7	
<b>8. I would like to have the chance to meet strangers.</b>	1	2	3	4	5	6	7	
<b>9. If given the chance, I would enjoy exploring unusual ideas or theories.</b>	1	2	3	4	5	6	7	
<b>10. I would like to explore the woods and interesting places near my town.</b>	1	2	3	4	5	6	7	
<b>11. I would enjoy being introduced to new people.</b>	1	2	3	4	5	6	7	

<b>12. I would pick up a book on an interesting topic and read some of it.</b>	1	2	3	4	5	6	7
<b>13. If I had time, I would enjoy watching TV shows on interesting topics such as science, history, art, or culture.</b>	1	2	3	4	5	6	7
<b>14. I would like to explore the ideas of foreign cultures.</b>	1	2	3	4	5	6	7
<b>15. I would enjoy joining a student group composed of a wide range of people I don't know.</b>	1	2	3	4	5	6	7
<b>16. I would like to go to a modern art museum.</b>	1	2	3	4	5	6	7
<b>17. I would strike up a conversation with a stranger on a bus or airplane and open up to the person.</b>	1	2	3	4	5	6	7
<b>18. I would like to go to a party if I didn't know very many of the people.</b>	1	2	3	4	5	6	7

---

## Appendix D

**Attachment Anxiety and Avoidance (Studies 2 and 5)**

This questionnaire is designed to assess the way in which you mentally represent important people in your life. You'll be asked to answer questions about your parents, your romantic partners, and your friends. Please indicate the extent to which you agree or disagree with each statement by circling a number for each item.

1) Please answer the following questions about your mother or a mother-like figure

2) Please answer the following questions about your father or a father-like figure

3) Please answer the following questions about your dating or marital partner.

*Note: If you are not currently in a dating or marital relationship with someone, answer these questions with respect to a former partner or a relationship that you would like to have with someone.*

4) Please answer the following questions about your best friend

	<b>Strongly Disagree</b>							<b>Strongly Agree</b>
<b>1. It helps to turn to this person in times of need.</b>	1	2	3	4	5	6	7	
<b>2. I usually discuss my problems and concerns with this person.</b>	1	2	3	4	5	6	7	
<b>3. I talk things over with this person.</b>	1	2	3	4	5	6	7	
<b>4. I find it easy to depend on this person.</b>	1	2	3	4	5	6	7	
<b>5. I don't feel comfortable opening up to this person.</b>	1	2	3	4	5	6	7	
<b>6. I prefer not to show this person how I feel deep down.</b>	1	2	3	4	5	6	7	
<b>7. I often worry that this person doesn't really care for me.</b>	1	2	3	4	5	6	7	
<b>8. I'm afraid that this</b>	1	2	3	4	5	6	7	



**person may abandon me.**

**9. I worry that this person  
won't care about me as  
much as I care about him or  
her.**

1

2

3

4

5

6

7

## Appendix E

### Secure Base Target Manipulation (*Study 2*)

#### *Close other*

**PLEASE READ THESE INSTRUCTIONS:** Now we'll ask you to write about your experiences in order to learn more about you. The topic we'll ask you to write about is very specific, so it is important that you read the instructions carefully and put some thought into your responses. Also, keep in mind that your responses will be kept completely anonymous. That means that you should feel free to write about your experiences and feelings *honestly*, knowing that your responses will never be linked back to you.

In the space below, write the name of one close other that you turn to for support and a short description of what that person is like:

Since starting this relationship, how has your life changed?

#### *Object*

**PLEASE READ THESE INSTRUCTIONS:** Now we'll ask you to write about your experiences in order to learn more about you. The topic we'll ask you to write about is very specific, so it is important that you read the instructions carefully and put some thought into your responses. Also, keep in mind that your responses will be kept completely anonymous. That means that you should feel free to write about your experiences and feelings *honestly*, knowing that your responses will never be linked back to you.

In the space below, write the name of one object that you wish you owned and a short description of what that object is like:

If you owned that object, how would your life change?

#### *Goal*

**PLEASE READ THESE INSTRUCTIONS:** Now we'll ask you to write about your experiences in order to learn more about you. The topic we'll ask you to write about is very specific, so it is important that you read the instructions carefully and put some thought into your responses. Also, keep in mind that your responses will be kept completely anonymous. That means that you should feel free to write about your experiences and feelings *honestly*, knowing that your responses will never be linked back to you.

In the space below, write the name of one goal that you wish to achieve and a short description of what that goal is like:

If you achieved that goal, how would your life change?

## Appendix F

**Felt Security (Study 2)**

Below is a series of words describing different experiences. Take a moment to reflect on how you feel **right now**, then rate how much each experience matches how you feel right now. There are no right or wrong answers, we are only interested in learning about your experience.

	Not at all					Very much
<b>1. Comforted</b>	1	2	3	4	5	6
<b>2. Supported</b>	1	2	3	4	5	6
<b>3. Looked after</b>	1	2	3	4	5	6
<b>4. Nervous</b>	1	2	3	4	5	6
<b>5. Secure</b>	1	2	3	4	5	6
<b>6. Worried</b>	1	2	3	4	5	6
<b>7. Safe</b>	1	2	3	4	5	6
<b>8. Protected</b>	1	2	3	4	5	6
<b>9. Afraid</b>	1	2	3	4	5	6
<b>10. Good about myself</b>	1	2	3	4	5	6
<b>11. Anxious</b>	1	2	3	4	5	6
<b>12. Uncertain</b>	1	2	3	4	5	6
<b>13. Loved</b>	1	2	3	4	5	6
<b>14. Full of doubt</b>	1	2	3	4	5	6
<b>15. Cared for</b>	1	2	3	4	5	6

## Appendix G

**Support Uncertainty Manipulation (Study 3)**

Now that we have a sense of your memory ability in general, we are interested in how you remember events about your own life. Previous research suggests that we can learn a great deal about people's memory by how they remember everyday events.

We will randomly select two of the sentences you saw in the earlier memory task. For each sentence, we will ask you to write about a time in your life that was similar. As you're writing about this time in your life, it is important that you provide a lot of detail about what you experienced and how it made you feel. That way, we can get a better sense of your ability to remember events from the past.

---

Read the sentence below. Now, take a few moments to think about a personal experience in which you felt like the person described in each sentence. Once you've remembered an experience that matches that sentence, write about it in the space below. Take some time to write about what happened, who was there, and how it made you feel. Whatever you write will be kept completely anonymous, so feel free to write honestly about this experience and your feelings. After you've written a few sentences, click continue.

*Low support uncertainty*

Matt ate the leftover pizza for lunch yesterday.

Zach arranged the chairs neatly around the table.

*High support uncertainty*

Rachel has a hard time trusting other people.

Ellen is constantly worried that her boyfriend will leave her

## Appendix H

**Support uncertainty manipulation (Study 4)***Initial target selection*

Please think of someone with whom you have a close, trusting relationship. This is a person that you feel very close to. You feel comfortable turning to this person for help when you need it. Now, write the name of that person in the box below. Remember that all of your responses are completely anonymous, so you can be confident that we will never link this name back to you or this person.

*Target specific support uncertainty prime*

Next we'll ask you to write about your personal experiences. The topic we'll ask you to write about is very specific, so it is important that you read the instructions carefully. As you're writing about these experiences, it is important that you provide a lot of detail about what happened and how it made you feel. That way, we can get a better sense of your ability to remember events from the past.

Press Continue

Sometimes we feel uncertain that we can really trust close others to be there for us. For example, you may feel unsure whether or not a friend would be there for you if you became ill or needed emotional support. Or you may feel unsure that a romantic partner would stay in a relationship if they found someone else.

Now, take a few moments to think about a personal experience in which you felt this way about your relationship with [target]. Once you've remembered an experience, write about it in the space below. Take some time to write about what happened, who was there, and how it made you feel. Whatever you write will be kept completely anonymous, so feel free to write honestly about this experience and your feelings.

Think about another time in your life when you felt uncertain that you could rely on [target]. Once you've remembered that experience, write about it in the space below. Again, take some time to write about what happened, who was there, and how it made you feel.

*Low support uncertainty*

In this part of the study, we would like you to think about your relationships in general. Most people believe that people are different from each other. This belief is backed up by a lot of research. Scientific studies show that although an individual may have one or two traits that they share with other people, most of what makes them who they are is unique. In other words, people are more different from each other than they are alike.

With this in mind, think about **THREE** ways in which [*target*] is **DIFFERENT** from other people you trust. Think about aspects of his or her personality or behavior that you have not seen before in other trusting relationships you have.

In the space below write about **ONE** of those differences. You can feel free to write honestly about your experiences because your responses are anonymous.

*High support uncertainty*

In this part of the study, we would like you to think about your relationships in general. Most people believe that people are pretty much alike. This belief is backed up by a lot of research. Scientific studies show that although an individual may have one or two traits that make them unique, that have a lot in common with most people. In other words, people are more alike than they are different from each other.

With this in mind, think about **THREE** ways in which [*target*] is **SIMILAR** to other people you trust. Think about aspects of his or her personality or behavior that you have seen before in other trusting relationships you have.

## Appendix I

**Worldview exploration (Study 4)**

The University of Kansas is considering working with Liberty Hall, a local independent film theatre, to develop a series of documentary films for KU. In order to do this, we are surveying student interest in a variety of films that could be brought to KU as part of a documentary film series.

The following pages contain a list of films that could be part of this series. Please read the film descriptions and answer the questions that follow.

**Film Title: The Science of God**

**Plot Outline:** Over 90% of Americans believe in a higher power. However, there is no evidence of such a supernatural being, but there is a growing amount of evidence from the fields of evolutionary biology, sociology, psychology, and neuroscience that humans may have created the concept of God to help them cope with the difficulties of life on this planet. This documentary reviews the history of religion around the world and follows the work of modern scientists who believe they have discovered and can prove that God is a human creation.

	Not at all interested						Extremely interested
<b>How interested are you in seeing this documentary?</b>	1	2	3	4	5	6	7

	Not at all likely						Very likely
<b>If KU did bring this documentary to campus, how likely is it that you would go see it?</b>	1	2	3	4	5	6	7

**Film Title: The Roots of Terrorism**

**Plot Outline:** The effects of terrorist attacks are told from different points of view around the world. This film explores how the policies of the United States have created anger and distrust in the Arab world and how many of the conditions that promote terrorism may have been created, as least indirectly, by American foreign policy.

	Not at all interested						Extremely interested
<b>How interested are you in seeing this documentary?</b>	1	2	3	4	5	6	7

	Not at all likely						Very likely
<b>If KU did bring this documentary to campus, how likely is it that you would go see it?</b>	1	2	3	4	5	6	7

**Film Title: Superpower China**

**Plot Outline:** Will the United States always be on top? Leading economists, political scientists, and military experts think the answer is no. China has now passed the U.S. as the greatest importer of energy and raw materials and is on its way to becoming the strongest economy in the world. China has a growing middle class and a thriving consumer market. With its fusion of capitalism and communism, China may soon be the new global power. This provocative film documents the success of China and how the country plans to rise to the top.

	Not at all interested						Extremely interested
<b>How interested are you in seeing this documentary?</b>	1	2	3	4	5	6	7

	Not at all likely						Very likely
<b>If KU did bring this documentary to campus, how likely is it that you would go see it?</b>	1	2	3	4	5	6	7

**Film Title: Practical Inventions**

**Plot Outline:** Ever wonder who created bubble gum, or invented the vacuum cleaner? This quirky film examines the history of some of the most widely used products in the world.

	Not at all interested						Extremely interested
<b>How interested are you in seeing this documentary?</b>	1	2	3	4	5	6	7

	Not at all likely						Very likely
<b>If KU did bring this documentary to campus, how likely is it that you would go see it?</b>	1	2	3	4	5	6	7

**Film Title: The Untold Story of Jesus**

**Plot Outline:** Over 90% of Americans believe that Jesus is the son of God. However, biblical historians and anthropologists have discovered that the story of Jesus is far less miraculous than people may think. This film explores the controversy behind the story of Jesus and highlights new evidence discovered by leading biblical scholars that suggests that Jesus may have been nothing more than a political radical who was later glamorized as a messiah in order to help a struggling cult of religious radicals sell their beliefs to mainstream Jews.

	Not at all interested						Extremely interested
<b>How interested are you in seeing this documentary?</b>	1	2	3	4	5	6	7



	<b>Not at all likely</b>						<b>Very likely</b>
<b>If KU did bring this documentary to campus, how likely is it that you would go see it?</b>	1	2	3	4	5	6	7

**Film Title: TV or Reality?**

**Plot Outline:** Why has reality television become so popular? This film examines this question through interviews with producers, executives, stars and viewers of popular reality TV shows.

	<b>Not at all interested</b>						<b>Extremely interested</b>
<b>How interested are you in seeing this documentary?</b>	1	2	3	4	5	6	7

	<b>Not at all likely</b>						<b>Very likely</b>
<b>If KU did bring this documentary to campus, how likely is it that you would go see it?</b>	1	2	3	4	5	6	7

## Appendix J

**Object feature manipulation (Study 5)***Impressive*

608 of 620 people found the following review helpful

★★★★★ **Solid NC Headphones, probably the best choice under \$300**

By [REDACTED] on July 1, 2007

**Amazon Verified Purchase**

After using other "over-the-ear" noise-cancelling headphones, I can say that these headphones are top notch. They look VERY nice. Total strangers have asked about them everywhere: at a coffeeshop, on a flight, in the office...pretty much anywhere you take these headphones, you will consistently impress people.

I also have to mention that the sound quality of these headphones is superb. After showing these off for over a year now, everyone says they sound better than any other headphones they've ever used. A lot of headphones are cheaper and might get you by, but these are truly a luxury.

[22 Comments](#)

Was this review helpful to you?

Yes

No

*Dependable*

608 of 620 people found the following review helpful

★★★★★ **Solid NC Headphones, probably the best choice under \$300**

By [REDACTED] on July 1, 2007

**Amazon Verified Purchase**

After using other "over-the-ear" noise-cancelling headphones, I can say that these headphones are top notch. They feel VERY comfortable. The noise-cancelling also works everywhere: at a coffeeshop, on a flight, in the office...pretty much anywhere you take these headphones, you will consistently have a great experience.

I also have to mention that the build quality of these headphones is superb. After tossing these into my backpack every day for over a year now, they still look and sound like they did on day one. A lot of headphones would be suffering from wearing speakers or damaged wires, but these are built to handle anything.

[22 Comments](#)

Was this review helpful to you?

Yes

No

## Appendix K

Curiosity (*Study 5*)

	<b>Strongly Disagree</b>						<b>Strongly Agree</b>
<b>1. I actively seek as much information as I can in new situations.</b>	1	2	3	4	5	6	7
<b>2. I am the type of person who really enjoys the uncertainty of everyday life.</b>	1	2	3	4	5	6	7
<b>3. I am at my best when doing something that is complex or challenging.</b>	1	2	3	4	5	6	7
<b>4. Everywhere I go, I am out looking for new things or experiences.</b>	1	2	3	4	5	6	7
<b>5. I view challenging situations as an opportunity to grow and learn.</b>	1	2	3	4	5	6	7
<b>6. I like to do things that are a little frightening.</b>	1	2	3	4	5	6	7
<b>7. I am always looking for experiences that challenge how I think about myself and the world.</b>	1	2	3	4	5	6	7
<b>8. I prefer jobs that are excitingly unpredictable.</b>	1	2	3	4	5	6	7
<b>9. I frequently seek out opportunities to challenge myself and grow as a person</b>	1	2	3	4	5	6	7
<b>10. I am the kind of person who embraces unfamiliar people, events, and places.</b>	1	2	3	4	5	6	7