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**SENTIMENTAL VALUE AND ITS INFLUENCE ON
HEDONIC ADAPTATION**

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Abstract

Sentimental value is a highly important and prevalent phenomenon in consumers' daily life. However, sentimental value as a construct is under-researched. It has not been clearly defined in marketing and psychology. As a result, it is largely unknown what characteristics sentimental value has, and what its antecedents and consequences are. My dissertation aims to make theoretical contributions by 1) introducing the construct of sentimental value, defining sentimental value, and empirically verifying my definition; 2) examining whether sentimental value can be actively created at the stage of product acquisition, and 3) demonstrating that sentimental value is critically important for consumer happiness with well-being, because it influences the rate of hedonic adaptation to products.

Building upon from prior work on philosophy, anthropology, and sociology, I define sentimental value as the non-feature-related value, derived from the associations with significant others or from the associations with special events or time in one's life. I empirically verify this definition of sentimental value and show that it largely fits consumers' lay understanding of sentimental value (Studies 1A and 1B). Next, I study an important consequence of sentimental value in the domain of hedonic adaptation, propose that sentimental value slows hedonic adaptation, and tests my theory in four studies. Study 2 tests the effect of sentimental value on hedonic adaptation using naturally occurring items and finds that people adapt more slowly to Christmas gifts than to Christmas purchases because the former have higher sentimental value. Studies 3A and 3B hold the items constant across conditions and replicate the slowing effect of sentimental value on hedonic adaptation. Study 4 experimentally manipulates sentimental value of an item in the laboratory and demonstrates its effect on hedonic adaptation over up to 9-month

period. I then test the underlying process by showing that whereas feature-related utility decreases for all items with time, sentimental value usually does not (Studies 3-5), and that sentimental value moderates the influence of the decrement in feature-related utility on hedonic adaptation (Study 5). Consistent with our theory, I also find that the number of associations with a significant other or with a special event or time that an item carries determines the level of sentimental value and the rate of hedonic adaptation. My dissertation yields theoretical implications for understanding the construct of sentimental value and its relationship with hedonic adaptation. It also yields practical implications for imbuing consumer products with sentimental value.

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1. INTRODUCTION

The unfortunate reality of the human experience is that happiness with stimuli is fleeting. Even though many experiences start off as enjoyable, with time, that enjoyment fades. This decrease in happiness, known as hedonic adaptation, occurs across a large variety of objects (Frederick & Loewenstein, 1999), and has resulted in a metaphorical “hedonic treadmill” (Brickman & Campbell, 1971) where people are forced to constantly spend money to upgrade their current experiences in order to maintain the same level of happiness.

An important question posed is: how can we slow unwanted hedonic adaptation? Recent research has greatly advanced our understanding of hedonic adaptation by examining how item features influence it (Bar-Anan, Wilson, & Gilbert, 2009; Carter & Gilovich, 2010, 2012; Galak, Kruger, & Loewenstein, 2013; Kurtz, Wilson, & Gilbert, 2007; Nelson, Meyvis, & Galak, 2009; Nicolao, Irwin, & Goodman, 2009; Temple, Giacomelli, Roemmich, & Epstein, 2008; Van Boven & Gilovich, 2003; Wilson, Centerbar, Kermer, & Gilbert, 2005). All of this work, however, makes the assumption that the sole inputs to hedonic adaptation are item features without considering the role that non-feature-related factors play. In the current research, we introduce a type of non-feature-related utility, sentimental value, explore its antecedents, and demonstrate its influence on hedonic adaptation. We propose that the happiness that individuals derive from an item is a weighted sum of at least two components: feature-related utility derived from item features (e.g., the appearance, functions, and specifications) and sentimental value derived from positive associations with a significant other or with a special event or time in one’s life. For example, consider these two situations: 1) a bicycle purchased for the self and 2) a bicycle received as a gift from a loving spouse. In this case, feature-related utility refers to the

utility that stems from the materials, appearance, functions, and specifications, while sentimental value refers to the value that stems from the fact that the bicycle reminds the owner of his or her spouse and the moments they were together. We propose that, first, while feature-related utility tends to decrease with time, sentimental value tends not to. Second, objects that are particularly sentimentally valuable do not exhibit hedonic adaptation. In the case of the bicycle purchased for the self, with time, the owner will adapt to it, but in the case of the bicycle received as a gift from a loved one, the owner will likely continue enjoying it for far longer. We explain our reasoning behind these predictions below.

The rest of this paper is organized as follows. We first define sentimental value and review the relevant literature. We then review literature on hedonic adaptation and submit two propositions about how and why sentimental value influences hedonic adaptation. Next, we report six studies (including two longitudinal studies over a period of up to 9 months) that examine the drivers of sentimental value, demonstrate its impact on hedonic adaptation, and investigate the proposed mechanism behind this effect. Finally, we discuss the contributions and implications of this research.

2. THEORETICAL BACKGROUND

2.1 Sentimental Value

2.1.1 Defining sentimental value

In order to understand what sentimental value is and is not, it is helpful to first consider the utility people derive from items. As illustrated in Figure 1, we propose that the utility that

people derive from owning an item is a function of two components. One component is feature-related utility, which is derived from item features (e.g., the appearance, functions, and specifications). For example, feature-related utility from a necklace is provided by its precious materials, pleasing design, and fine quality. The second component to total utility is non-feature-related utility, which is defined by the value derived from all other factors that are beyond item features. For example, in addition to item features, people may gain value if an item reflects who they are (i.e., value from identity signaling), is of a favorable brand (i.e., brand value) or is a particularly good deal (i.e., transaction utility).

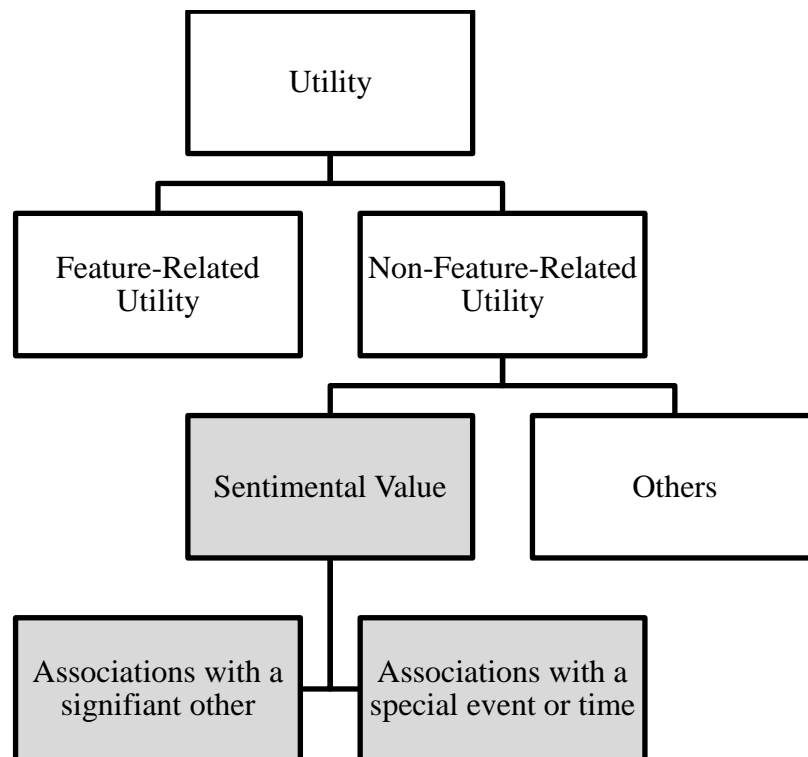


Figure 1: Components of Utility

Though these are all important components of non-feature related utility, the central focus of this research is sentimental value. Sentimental value stems from two places: 1) associations with “significant others,” defined as “any individuals who are or have been deeply influential in a person’s life and in whom one is or once was emotionally invested” (Andersen & Chen, 2002, p.619) such as family members, romantic partners, and close friends; and 2) associations with “special events or time in one’s life,” defined as events or time that are “distinguished by some unusual quality, especially being in some way superior (Merriam-Webster dictionary) such as weddings, graduations, birth of a child, and personal achievements. For example, a necklace purchased by a loving spouse while on vacation can provide the recipient with sentimental value either from the fact that the necklace brings to mind the loving spouse or because it brings to mind the wonderful times the couple shared on the vacation. It need not be that both forms of associations appear simultaneously, nor must it be that they appear independently. It is worth noting that for the purposes of this research, we make no specific predictions about the relationship between the different antecedents of sentimental value and the consequences that follow, but rather present both to better define the construct.

Although sentimental value is a highly prevalent phenomenon in individuals’ daily lives (Belk, 1988, 1991; Csikszentmihalyi & Rochberg-Halton, 1981; List & Shogren, 1998; Solnick & Hemenway, 1996; Wallendorf & Arnould, 1988), it has yet to be clearly defined and systematically studied. The best scholarly definitions of sentimental value come from philosophy (Fletcher, 2009a, 2009b; Hatzimoysis, 2003). Though these definitions vary, we build upon from Fletcher (2009b) and define sentimental value as the non-feature-related value, derived from the

associations with significant others or from the associations with special events or time in one's life. For example, an item can have sentimental value because it belonged to or was used by a family member, because it was received as a gift from a friend or a person one loves, or because it is a token that represents a particular life event (e.g., a souvenir from a vacation or a diploma earned upon graduating from college). In all these cases, sentimental value lies with the associations that the objects evoke (e.g., with a family member, a loved one, a friend, or a special event or time).

Below we provide three clarifications for the definition. First, sentimental value is the value derived from specific types of associations, namely, associations with a significant other or with a special event or time in one's life. Therefore, the value derived from other associations (e.g., identity signaling) should not be confused with sentimental value. Second, our definition of sentimental value explains the necessary conditions, rather than sufficient conditions, for an object to have sentimental value. That is, although an object can acquire sentimental value due to the aforementioned associations, objects that carry such associations do not necessarily have sentimental value. For example, the fact that an item has sentimental value because it reminds one of her husband does not mean that any item that reminds her of her husband has sentimental value. As a result, sentimental value cannot be explained by the mere association of an item with a significant other or with a special event or time one considers positive. In our research, we assume and demonstrate that people have a shared understanding of what types of objects are sentimentally valuable and do not attempt to provide all necessary conditions for such sentimental value. Third, for the purpose of this research, we only consider sentimental value that is positive, leaving the question of whether sentimental value can even be negative to future research.

2.1.2 Evidence of sentimental value

Prior research examining sentimental value falls into two major categories: work looking to identify the existence and magnitude of sentimental value and work looking at the overall relationship between people's possessions and themselves. In the anthropological work by Csikszentmihalyi and Rochberg-Halton (1981), the researchers interviewed 315 Chicago residents about the objects in their homes which they consider "special" in any way. They then went on to categorize the 6,585 different objects that these individuals identified as to why they were "special." Relevant to the present research, they identified that, of all objects that people had any value for (including merely having strong monetary value), 15.6% fell into categories that we would consider to be sentimental in nature (e.g. "Memento", "Heirloom", "Souvenir", etc...;Csikszentmihalyi & Rochberg-Halton (1981), Appendix D). That is, approximately one in six items that people cherish, they do so because of sentimental value. Slightly more recent research using in-home personal interviews found that 60% of Americans chose an object as their "favorite" because of personal memories associated with the object, as opposed to the functionality associated with the object (Wallendorf & Arnould, 1988). That is, the majority of favorite objects are ones that evoke strong associations and not ones that are, say, monetarily valuable. In economics, the sentimental value of gifts to gift recipients has been quantified such that, on average, the total value that gift recipients derive from their gifts is comprised roughly half of material value and half of sentimental value (List & Shogren, 1998; Solnick & Hemenway, 1996). In sum, as to the questions of whether sentimental value exists and whether it is relevant, there appears to be ample evidence suggesting that it does and it is.

Of course, this work speaks little to the rich relationship that individuals have with such items, especially when those items are sentimentally valuable. For this, we turn more to the consumer culture theory literature which, for a long time, has been interested in the rich relationship that individuals have with their possessions. Though this literature seldom uses the term “sentimental value,” it is clear that sentimental value is an important component to the relationship that individuals have with their possessions (Arnould & Thompson, 2005; Belk, 1991; Bradford, 2009; Curasi, Price, & Arnould, 2004; Price, Arnould, & Curasi, 2000; Wallendorf & Arnould, 1988). For instance, Belk discussed five cases of special possessions (Belk, 1991). Most related to sentimental value, Belk refers to “memory-laden objects” including family photographs, heirlooms, wedding rings, gifts, and souvenirs of enjoyable travel. These special possessions are valued because they are able to evoke particular memories of times, places, and people. Indeed, Belk describes them as being “...mnemonic device[s] that evoke affective experiential knowledge...” (Belk 1991, p.29) when interacted with. That is, when a person interacts with a memory-laden object, she is reminded of the affective experience that she had either with the significant other gave her the object, or the event or time that the object commemorates.

Taken together, previous research related to sentimental value suggests that sentimental value is prevalent and plays a critical role in individuals’ life experiences. However, sentimental value was never formally defined, its antecedents haven’t been systematically tested, and the causal relationship between sentimental value and other variables is largely unknown. The current research aims to fill these gaps by formally defining sentimental value, beginning to systematically investigating the antecedents of sentimental value, and studying the role sentimental value plays in influencing the happiness one derives from an object over time.

2.1.3 Sentimental value as a unique construct

Sentimental value is related to, yet different from, a number of other constructs. For instance, sentimental value is related to, but distinct from, nostalgia. Nostalgia refers to a “belief that things were better...then than now” (Davis, 1979, p.18), or “a preference toward objects...that were more common...when one was young” (Holbrook & Schindler, 1991, p.330). Nostalgia and sentimental value are different constructs for at least two reasons. First, sentimental value can exist without nostalgia. For instance, the wearer of a wedding ring does not have to be nostalgic to appreciate the sentimental value of the ring. That is, the wearer receives value from the ring simply because it reminds him or her of a spouse. It is not necessary that the ring also cause the wearer to think that the past was better than the present. Second, because the sentimental value of an item is determined by fixed factors, such as its associations with a significant other or the extent to which it commemorates a special event, sentimental value is relatively stable (we discuss this in more detail below). Nostalgia, however, can be easily influenced by situational factors, such as negative mood and the discrete affective state of loneliness (Wildschut, Sedikides, Arndt, & Routledge, 2006). That is, nostalgia waxes and wanes as circumstances change within a day, but sentimental value, short of a major life change, remains relatively constant.

In addition, sentimental value differs from identity signaling. Identity signaling theory states that individuals obtain and consume an item not only because it has certain features, but also because it reflects who he or she is as an individual (Belk, 1988; (Berger & Heath, 2007, 2008; Ferraro, Escalas, & Bettman, 2011; Kleine III, Kleine, & Kernan, 1993; Kleine et al., 1995; Levy, 1999). Sports fans wear t-shirts with their favorite sports team’s logo not only because the

shirts are aesthetically pleasing (a form of feature-related utility), but also because those shirts signal to themselves and to others that part of their identity is an affiliation with that team. Sentimental value is different from the value of identity signaling in that sentimental value can be derived regardless of whether the item is identity relevant or not. That is, sentimental value can exist in items ranging from the most identity relevant (e.g., music CDs) to the most identity irrelevant (e.g., bike light) (Berger and Heath 2007), as long as the item hold valuable associations to the individual.

Sentimental value is also distinct from the notion of an extension of the self. Although sentimentally valuable possessions may become extensions of the self, an object that is an extension of the self does not necessarily possess sentimental value. In fact, many of the possessions that are very close to the center of the self (e.g., body parts, the roof of a house, furniture, clothing) may not have any sentimental value at all. Moreover, sentimental value and objects that are “extensions of the self” have different antecedents: whereas sentimental value is usually caused by associations with a significant other or by associations with a special event or time in one’s life, possessions that are extensions of the self are primarily appropriated or controlled as an object for personal use, created by the individual, or extremely well known to the individual (Belk, 1988; Sartre, 1956), none of which is critical to sentimental value.

Finally, sentimental value is related to, and yet different from, product attachment – “the strength of the emotional bond a consumer experiences with a product” (Kleine & Baker, 2004; Kleine et al., 1995; Mugge, Schifferstein, & Schoormans, 2010; Schifferstein & Zwartkruis-Pelgrim, 2008). Specifically, sentimental value and product attachment differ in their scope: whereas sentimental value is a type of non-feature-related utility derived solely from associations

with a significant other or associations with a special event or time, product attachment can be generated by many other factors, including both feature-related utility (e.g., item utility, appearance, item design) and non-feature related utility (i.e., identity, self-expression) (Mugge et al., 2010; Mugge, Schoormans, & Schifferstein, 2008; Richins, 1994; Schifferstein & Zwartkruis-Pelgrim, 2008). For example, product attachment is highest for items that have higher functional utility and are more aesthetically pleasing (Mugge et al., 2010). In contrast, sentimental value is agnostic to these dimensions. An item can have no functional utility and be aesthetically ugly (e.g. a jagged rock picked up by a romantic partner during a first date), and yet still be highly sentimentally valuable as it holds strong associations (e.g. reminder of that first date). Although sentimental value may lead to product attachment, the two are, in fact, distinct constructs. One can think of the relationship between sentimental value and product attachment as a relationship between antecedent and consequence.

2.2 Hedonic Adaptation

A central goal that individuals pursue is to maximize their happiness (Russell, 1930). Although any improvement in acquisition and consumption may increase happiness, the increased happiness may not persist. One reason for this is hedonic adaptation, defined as a decrease in hedonic response to a stimulus over time (Frederick & Loewenstein, 1999; Helson, 1964). For example, a person may feel very happy right after acquiring a new item, but may not feel nearly as happy with it as time goes by. This adaptation is determined by multiple factors, including basic psychophysical habituation, diversion of attention, and rationalization (Frederick & Loewenstein, 1999; Helson, 1964; Wilson et al., 2005; Wilson, Wheatley, Meyers, Gilbert, & Axsom, 2000). Moreover, hedonic adaptation is rather robust and prevalent. People adapt to

change in income (Di Tella, Haisken-De New, & MacCulloch, 2010), experiences (Epstein, Temple, Roemmich, & Bouton, 2009; Nelson & Meyvis, 2008; Nelson et al., 2009; Redden, 2008), academic careers (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998), and even to extreme life-changing events like incarceration (Zamble, 1992).

In the domain of possessions, hedonic adaptation manifests in the fact that individuals' happiness with most items and experiences fades over time (Epstein, Temple, Roemmich, & Bouton, 2009; Nelson & Meyvis, 2008; Nelson et al., 2009; Redden, 2008). For example, in one study, participants were given a kaleidoscope and told to interact with it either for one or seven days (Wang, Novemsky, & Dhar, 2009). Despite initially rather enjoying their interaction, after seven days, happiness with the item decreased quite significantly, suggesting that participants adapted to the kaleidoscope rather quickly.

An important question posed to researchers is how can we slow unwanted hedonic adaptation? Recent research has greatly advanced our understanding of hedonic adaptation by examining how item features influence hedonic adaptation. First, contrary to common belief, breaks in a pleasant experience (e.g., a massage or television program) disrupt adaptation and make the experience more pleasant (Galak et al., 2013; Nelson & Meyvis, 2008). Second, increasing the variations or even the perceived variations of a stimulus reduces adaptation (Redden, 2008; Temple et al., 2008). For example, individuals presented with a variety of foods experienced a slower decrease in responses to foods than those presented with the same favorite food (Temple et al., 2008). Third, uncertain features are more difficult to adapt to than certain features (Bar-Anan et al., 2009; Kurtz et al., 2007; Wilson et al., 2005). Finally, experiential

goods are more resistant to adaptation than material goods (Carter & Gilovich, 2010, 2012; Nicolao et al., 2009; Van Boven & Gilovich, 2003).

All of this work, however, makes the assumption that the sole inputs to hedonic adaptation are item features without considering the role that non-feature-related factors play. In the current research, we explore the influence of one type of non-feature-related utility on hedonic adaptation by examining the relationship between sentimental value and adaptation. For simplicity, we consider only two components from which individuals derive happiness: feature-related utility and sentimental value. We do so not to suggest that other components may be less relevant, but instead try to keep our conceptualization clear and precise. Indeed, we take care in our experiments to manipulate sentimental value without also manipulating other forms non-feature related utility.

2.3 Sentimental Value Influences Hedonic Adaptation

Do people adapt to objects with high sentimental value in a manner similar to objects with low sentimental value? To understand the effect of sentimental value on hedonic adaptation, it is important to consider how feature-related utility and sentimental value simultaneously influence the happiness that a person derives from an item over time. This can be best understood by considering three cases. The first case is where an object has predominantly sentimental value, but has little feature-related utility (e.g. the same jagged rock picked up on a first date). We propose, and will elaborate on and demonstrate empirically below, that in most cases, sentimental value does not decrease with time. Thus, in this instance, happiness with the object does not decrease with time and remains relatively constant, as the primary input to happiness is sentimental value. The second case is where an object has low sentimental value,

but high feature-related utility (e.g. an iPad purchased for the self). In this instance, happiness is derived mainly from feature-related utility. Over time, as has been well documented, feature-related utility decreases and so does the happiness with the object. Finally, the most interesting case is where an object has high sentimental value and, at least at first, high feature-related utility (e.g. an iPad received from a caring romantic partner as a gift). We hypothesize, and will empirically demonstrate, that happiness with this object is less likely to decrease than that with the second case, despite a decrease in feature-related utility. In other words, we hypothesize that the happiness with an object fades more slowly when the object has higher versus lower sentimental value.

We further propose that this effect occurs because of two reasons: 1) sentimental value typically does not decrease with time (the *temporal effect*); and 2) sentimental value moderates or overrides the influence that feature-related utility has on happiness, such that the higher the (lower) sentimental value an object has, the lower (greater) is the influence of feature-related utility on happiness (the *moderating effect*). Below we elaborate on these two reasons.

2.3.1 The temporal effect of sentimental value

Regarding the temporal dynamics of sentimental value, though no prior work has directly addressed the issue of how sentimental value evolves over time, some evidence suggests that sentimental value may not decline with time. For example, wedding rings hold the same or even more sentimental value for older couples than for newlyweds, and the sentimental value of family heirlooms does not fade over time or generations (Belk, 1988, 1991; Curasi et al., 2004; Wallendorf & Arnould, 1988). Why, though, is sentimental value immune to the passage of time? The reasons are twofold. First, family, romantic relationships, and friendships are the most

important and closest interpersonal relationships an individual has in life (Andersen & Chen, 2002; Berscheid, Snyder, & Omoto, 1989). As compared to other insignificant interpersonal relationships, these relationships last much longer and are much more stable (Granovetter, 1983). Therefore, we expect that the sentimental value of objects that evoke thoughts of these relationships will not fade easily. Similarly, prior work shows that although individuals' preferences can be easily influenced by environment cues (Lichtenstein & Slovic, 2006), individuals' evaluations of important events and times in their lives are quite stable (Dunning, 2007). For example, events such as graduation from college and getting married are likely to be considered as events or moments that are worth commemorating throughout one's life time. Accordingly, the sentimental value of objects that commemorate such events and time is less likely to decline with time. Second, people tend to remember meaningful personal events more positively than they actually were (Bartlett, 1995; Greenwald, 1980; Mitchell, Thompson, Peterson, & Cronk, 1997; Sutton, 1992). In one study, for example, participants' recollection of a bicycle trip was more favorable than reported enjoyment during the trip. Even though more than half of participants experienced disappointment during the vacation, in retrospect, only 11% of participants remembered feeling disappointed. This line of research suggests that sentimental value of an object may actually increase if memories and associations become more positive over time. A souvenir purchased during vacation may become more sentimentally valuable weeks later if the vacation is viewed more favorable and meaningful in retrospect. In summary, prior research suggests that sentimental value usually does not decline with time and that it may even increase over time. We empirically test this temporal effect in Studies 2B-6.

2.3.2 The moderating effect of sentimental value

Regarding the moderating role of sentimental value in determining the influence of feature-related utility on happiness with an object, this effect is inspired by previous work suggesting that people cherish objects with high sentimental value regardless of whether they have low or high feature-related utility (Curasi et al., 2004; Sherman & Newman, 1977; Wallendorf & Arnould, 1988). For example, when American respondents were asked to explain why they chose a particular object as their favorite, they did not focus on feature-related attributes, but rather on the personal memories these objects brought to mind (Wallendorf & Arnould, 1988). Moreover, there was no evidence that objects with higher feature-related utility were more likely to be chosen as the favorite (Belk, 1991; Wallendorf & Arnould, 1988). This suggests that, though important for objects with low sentimental value, feature-related utility is much less critical in determining happiness with an object that has high sentimental value (Belk, 1991). Moreover, sentimental value's capability of overriding the influence of feature-related utility on happiness may be due to a shift in attention. When an object is highly sentimentally valuable, the owner focuses more on the associations it evokes and less on the object features themselves. Accordingly, the item features play a much lesser role in influencing happiness with objects that have high sentimental value. We directly test this moderating effect in Study 5.

Taken together, the *temporal effect* and the *moderating effect* explain how happiness with an object changes over time. For objects that have low sentimental value, individuals' happiness heavily depends on feature-related utility. Because feature-related utility decreases with time, happiness also decreases with time. For objects that have high sentimental value, individuals'

happiness heavily depends on sentimental value and less so on feature-related utility. Because, in most cases, sentimental value does not decrease with time, happiness is less likely to decrease. Therefore, we predict that people adapt more slowly to objects that have high sentimental value than those that have low sentimental value.

3. OVERVIEW OF STUDIES

We next report six studies that test our hypotheses. Studies 1A and 1B explore the antecedents of sentimental value and empirically verify our definition of sentimental value. Study 2 examines the effect of sentimental value on hedonic adaptation using naturally occurring items, and compares people's happiness with Christmas gifts versus Christmas purchases made for the self. We predict that Christmas gifts have higher sentimental value, and that this sentimental value will lead to a slower rate of hedonic adaptation. Study 3A and 3B hold the items constant across conditions and replicate the slowing effect of sentimental value on hedonic adaptation. It examines people's happiness with photos, and shows that people adapt to photos of sentimentally valuable places more slowly than to photos of sentimentally valueless places. Study 4 experimentally manipulates sentimental value of an item in the laboratory, and demonstrates its effect on hedonic adaptation over up to 9-month period. Specifically, we associate an item with either one's romantic partner (i.e., a significant other) or the experimenter (i.e., not a significant other), and show that items associated with a romantic partner are more sentimentally valuable. This increased sentimental value leads to a decrease in hedonic adaptation. We then test the underlying process by showing that whereas feature-related utility decreases for all items with time, sentimental value usually does not (Studies 3-5), and that sentimental value moderates the influence of the decrement in feature-related utility on hedonic

adaptation (Study 5). Consistent with our theory, we find that the number of associations with a significant other or with a special event or time that an item carries determines the level of sentimental value and the rate of hedonic adaption.

4. STUDIES 1A AND 1B

Building on previous work on sentimental value in philosophy, anthropology, and consumer culture theory, we define sentimental value as the value derived from associations with significant others or from associations with special events or time in one's life. The purpose of Studies 1A and 1B is to validate this definition and explore the antecedents of sentimental value.

4.1 Study 1A

4.1.1 Method

Participants. One hundred Americans (29 Females; $M_{\text{age}} = 29.96$, $SD = 10.04$) from the Amazon Mechanical Turk (mTurk) online panel completed a survey in exchange for \$0.30.

Procedure. Participants were asked to think of one durable item they currently own that has lots of sentimental value to them and provide a brief description of that item. Next, they were asked to explain why this item had sentimental value to them in as much detail as possible (open-ended).

A research assistant read over all 100 responses and identified four themes that emerged: items that commemorate a special event or time, items that act as reminders of other people, items that were gifts, and items that were inherited. Next, two Amazon mTurk "categorization master coders" blind to our hypotheses independently reviewed the description of each item and

coded the reasons participants provided based on these four categories. Specifically, for each item, they indicated if the description included any reference to any of the four aforementioned categories¹.

4.1.2 Results

We found a high inter-rater agreement for all four categories. The measured Cohen's Kappa ranged from .71 to .92, $ps < .001$. For the items that the coders disagreed on, we used a conservative approach and assumed that the reason provided did not include the category. As shown in Table 1, 51.0% of the items commemorated a special event or time; 58.0% of the items reminded participants of a significant other. Overall, 80.0% of items were either associations with a special event or time or associations with a significant other. That is, 80.0% of the items participants listed were sentimentally valuable for reasons consistent with our proposed definition. In addition, 41.0% of the items were gifts, and 5.0% were inherited. Overall, 46.0% of items were either received as gifts or inherited.

Study 1A	<u>Associations</u>			<u>Source</u>			Total
	Event or Time	Person	Either	Gift	Inheritance	Either	
Coding							
Yes	51.0%	58.0%	80.0%	41.0%	5.0%	46.0%	83.0%
No	49.0%	42.0%	20.0%	59.0%	95.0%	54.0%	17.0%

Table 1: Sources of Sentimental Value in Study 1A

4.2 Study 1B

Study 1B sought to validate the results of Study 1A by assessing if important, but not sentimentally valuable, objects also elicit the associations described above. If that is the case, then sentimentally valuable objects are no different than, say, monetarily valuable objects. To test this distinction, we borrowed one of the methodologies used by Kamptner (1989) in assessing the value of personal possessions and asked participants to indicate three important objects to them. We then assessed the degree to which the associations listed above appear more prominently with sentimentally valuable objects as compared to non-sentimentally valuable objects. We predict that associations with a significant other and/or associations with special events or time in one's life should appear much more prominently for objects that are sentimentally valuable.

4.2.1 Method

Participants. One hundred and one Americans (42 Females; $M_{\text{age}} = 35.63$, $SD = 13.44$) from the Amazon mTurk online panel completed a survey in exchange for \$0.50.

Procedure. To elicit objects that were equally important but differed in the type of value they possess (sentimental or otherwise), participants imagined a hypothetical scenario where their home was burning down and they could save any three objects. Specifically, participants read “*In this study we'd like you to imagine that your home was about to be destroyed by fire. Thankfully all people and pets living in the home are completely safe. However, the possessions in your home are likely to be lost to the fire. We'd like you to imagine that you could save three,*

and only three, objects that are in your home. For the purpose of this question, the size of the object doesn't matter. For instance, if you'd like to save your refrigerator, assume that you could get it out without a problem. The size and weight aren't relevant. Below, please take a moment to list the three objects.” Each participant then listed three objects. For each object, they answered two questions: “This object has sentimental value to me” and “This object has functional value” on 7-point scales (1 = strongly disagree, 7 = strongly agree). In addition, participants reported whether the item commemorated a special event or time in their life, whether the item reminded them of a significant other, such as family members, romantic partners, and friends (yes, no, unsure), and how they acquired the item (purchase, gift, inheritance, unsure, other).

4.2.2 Results

Table 2 summarizes the information about objects that were considered highly sentimentally valuable (i.e., items that scored 7 on “The object has sentimental value to me”). Consistent with the result of Study 1A, 68.5% of the items commemorated a special event or time, 75.9% of them reminded participants of a significant other. Overall, 84.3% of items were either associated with a special event or time or with a significant other. That is, 84.3% of the items participants listed were sentimentally valuable for reasons consistent with our proposed definition. In addition, 25.9% of them were gifts, and 17.6% of them were inheritance. In total, 43.5% of items were either received as gifts or inherited.

Study 1B Coding	<u>Associations</u>			<u>Source</u>			Total
	Event or Time	Person	Either	Gift	Inheritance	Either	
Yes	68.5%	75.9%	84.3%	25.9%	17.6%	43.5%	89.8%
No	25.9%	22.2%	13.0%	74.1%	82.4%	56.5%	7.4%
Unsure	5.6%	1.9%	2.8%				2.8%

Table 2: Sources of Sentimental Value in Study 1B

Note—This table reflects data only from respondents who indicated that the object was highly sentimentally valuable (a 7 on the scale used to measure sentimental value).

Importantly, we argue that such associations are unique properties of objects that have sentimental value, rather than properties of objects that are merely considered important. Supporting this argument, we found that objects with higher sentimental value were more likely to be associated with a special event or time ($r = .56, p < .001$), or with a significant other ($r = .54, p < .001$). Specifically, as shown in Appendix A, though all objects, by the nature of the task, were important to participants, the more an object was sentimentally valuable, the more it was likely to hold associations with special events or others.

4.3 Discussion

Results of Studies 1A and 1B suggested that our definition of sentimental value largely fits individuals' lay understanding about sentimental value. The thought protocol analysis of Study 1A revealed that at least 80% of sentimentally valuable items were valued as a result of their associations with a significant other or/and associations with a special event or time in one's life. Study 1B replicated this finding and showed that these associations were properties

that only belong to objects that were sentimentally valuable, as opposed to objects that were important in general.

5. STUDY 2

Having empirically validated the definition of sentimental value, Study 2 aims to demonstrate that sentimental value reduces the rate of hedonic adaptation by comparing happiness with gifts versus purchases over time. Specifically, participants listed either all gifts they received or all purchases they made during a Christmas holiday season and indicated happiness with each item across two time periods, both shortly after acquisition and 45 days later. We hypothesize that items received as gifts will have greater sentimental value than items purchased for the self, and that this sentimental value will lead to a reduction in the rate of hedonic adaptation.

5.1 Method

This study consisted of two parts that were spaced 45 days apart. Participants were recruited from the Amazon mTurk online panel and paid \$0.50 for completion of each part.

Part I. Two hundred and seventy-three Americans (97 Females; $M_{\text{age}} = 29.81$, $SD = 9.99$) completed the first part of the study on January 3rd, 2013. Participants were asked to recall either all durable non-food or non-cash (e.g. gift cards) gifts they received (*gift* condition), or all non-food or non-cash items they purchased for themselves (*purchase* condition), during the Christmas holiday period of 2012 (which occurred the previous week). All participants were asked to type each item into a textbox, one at a time, until they could not think of any more items.

To measure the initial happiness with the items, participants indicated how happy they were at that very moment with each item they listed, one at a time (1 = *Very unhappy*, 11 = *Very happy*). Finally, participants indicated the cost of each item, to be used as control measures.

Part II. Participants listed 996 items in total during the first part of the study. Two research assistants blind to the hypothesis and the condition from which the items came reviewed all the items and deleted 41 monetary gifts (i.e., cash and gift cards), 18 food items, and 2 tickets, because we explicitly instructed participants not to list those items as they would likely not possess them for a long period of time. Forty-five days following the first part of the study, participants received a customized email listing the items they reported during the first part of the study (excluding those items that were deleted) and asking them to participate in a follow-up study. One hundred and eighteen participants (43 Females; $M_{\text{age}} = 32.88$, $SD = 12.10$) completed the second part of the study and answered questions about the 431 items they listed during the first part. Participants who elected to complete Part II were no happier with the items during Part I as compared to those who did not complete Part II ($M_{\text{complete}} = 9.28$ vs. $M_{\text{incomplete}} = 9.06$, $t(268) = .44$, $p = .67$).

Once participants agreed to participate in the second part of the study, they indicated (one at a time) whether they still possessed each item, how they felt about each item at that moment on the same scale used in Part I, how much sentimental value each item had to them at that moment (1 = *None at all*, 7 = *Very much*), and the lowest amount of money they would accept to sell each item (willingness to accept, WTA).

Item Categorization. It is quite possible that the items listed across our two conditions (*gift vs. purchase*) differed. That is, it is possible that gifts received were fundamentally different

in nature from items purchased. For instance, individuals may receive more clothing and clothing accessories as gifts than they purchase for themselves, and may purchase more electronics for themselves than they receive as gifts. If this is the case, then any conclusions drawn from this study (and Study 4) may be a function of item type and not sentimental value per se. Therefore, we sought to categorize the items listed in our studies to determine if the nature of gifts received was fundamentally different from nature of the purchases made.

In this study, we observed 407 objects either purchased or received as gifts. In order to determine if the type of objects varied depending on whether they were purchased or received as a gift, we categorized each item into one of eight categories. We accomplished this task by employing the Amazon mTurk categorization system. This system is a special case of the general Amazon mTurk system and is optimized for performing categorization tasks with human coders. Coders were shown the description of one item at a time and asked to categorize it into one of 19 item categories (some categories were nested within others; e.g. “Car” was nested within “Car or Car Accessories”; see the first two columns of Appendix B). Categories were chosen by one of the authors after reading a sample of the items. They were chosen to be both general enough to include virtually all items listed and specific enough to allow for subsequent inferences. Coders were paid \$0.03 per item categorized. Each item was categorized by two independent coders and any disagreements were resolved by a third, non-mTurk coder. Twenty-eight mTurk coders completed the task. Because a coder was free to categorize as few or as many items as they liked, the number of completed categorization tasks varied across individuals, with the average number of items per coder being 29 (Max = 120; Min = 1). Following the categorization task, the items were spot checked for accuracy and categories with few items (e.g., musical instruments) were rolled up into more general categories (e.g., Sporting Equipment, Musical Instruments, and

Games (not Video Games)). Eight (2.0%) of the items did not easily fall into any of the remaining categories (e.g., “1 ounce gold bar”) and were labeled as “Other”. We found agreement for 77.9% of the items and resolved the remaining disagreements as described above.

5.2 Results

Items. Appendix C shows the items that participants still possessed at the time of Part II. There was a significant difference between conditions ($\chi^2(7) = 14.88, p = .04$) in the type of items received or purchased. For instance, participants purchased many more *Electronics and Electronic Accessories* than they received as gifts, and received many more *Clothing and Clothing Accessories* as gifts than they purchased. On the surface, this difference poses a problem in interpreting our subsequent analyses because the nature of items differs across conditions. To address this problem, in this study and Studies 4 and 5 we statistically control for the variation in item types by including category level dummy variables in all of our analyses. As will be evident, even when controlling for these differences statistically, our results demonstrate that sentimental value plays a critical role in determining rates of hedonic adaptation.

Besides item type, it is possible that the items also differed on other related dimensions, such as cost. Because the cost of the items was positively skewed, we performed a log transformation and used the natural log of the cost as a covariate in our analyses. Additionally, because each participant listed multiple items resulting in the possibility of non-independent residuals, we cannot use standard OLS regression. Instead we use regression with robust standard errors using participants as the cluster variable to account for this non-independence. Doing so takes into account the fact that the ratings made by one participant for multiple items are likely to be at least somewhat correlated. Thus, we examined the differences between

conditions by conducting linear regressions of different variables on source (0 = purchase, 1 = gift) with clustered robust standard errors. A linear regression of the natural log of cost on source (0 = purchase, 1 = gift) revealed no difference in cost between conditions (untransformed cost: $Median_{gift} = \$25.00$ vs. $Median_{purchase} = \$25.00$; $B = -.06$, $SE = .16$, $t(114) = -.40$, $p = .69$). Although no difference in the natural log of cost was found in this study, it was significantly different across conditions in other studies and so, to be consistent in our analyses, we still include it as a covariate in our analyses of this study.

Possession. Participants in the *gift* condition were more likely to still possess the items 45 days after Part I than those in the *purchase* condition (97.0% vs. 90.3%; $B = 1.47$, $SE = .55$, $Wald = 7.05$, $p = .008$) when controlling for the category level dummy variables and the natural log of cost, suggesting that participants were less likely to dispose of gifts than purchases. Though this effect is entirely consistent with our predictions, we do not wish to overstate these results as possession levels were generally very high across both conditions.

Sentimental Value, Happiness, and WTA. We first confirm that gifts were, in fact, more sentimentally valuable than their purchased counterparts. A linear regression of sentimental value on source (0 = purchase, 1 = gift), category level dummy variables and the natural log of cost, with clustered robust standard errors, revealed a significant effect of source ($M_{gift} = 4.36$ vs. $M_{purchase} = 3.74$; $B = .66$, $SE = .26$, $t(114) = 2.58$, $p = .01$) such that gifts were more sentimentally valuable than purchases.

Appendix D shows the percentage of change in happiness of all our studies where happiness was measured. To determine the rate of hedonic adaptation, we subtracted Part I happiness ratings from Part II happiness ratings. This resulted in a measure of change in

happiness across time and served as our measure of hedonic adaptation. Negative values represent decreases in happiness while positive values represent increases in happiness. Note that in some studies, the initial happiness was significantly different across conditions, and thus it is possible that the difference in hedonic adaptation may be caused by difference in initial happiness. To rule out this explanation, we included the initial happiness as a covariate in regressions whenever hedonic adaptation was involved in all studies. Not including it as a covariate does not meaningfully change the results. Specifically, a linear regression of change in happiness on source (0 = purchase, 1 = gift), category level dummy variables, the natural log of cost and happiness measured at Part I, with clustered robust standard errors, revealed a significant effect of source ($M_{gift} = -.11$ vs. $M_{purchase} = -.60$; $B = .56$, $SE = .18$, $t(114) = 3.05$, $p = .003$), indicating that participants adapted to gifts more slowly than to purchases. As can be seen in Figure 2, we found that happiness with purchases significantly decreased over time ($M_{Part I} = 9.29$ vs. $M_{Part II} = 8.69$; $t(148) = 4.87$, $p < .001$), whereas happiness with gifts did not ($M_{Part I} = 9.40$ vs. $M_{Part II} = 9.29$; $t(257) = 1.09$, $p = .28$), indicating that participants adapted to purchases, but not gifts. Finally, because the WTA of the items was positively skewed, we performed a similar regression of the natural log of WTA and found a significant effect of source (untransformed WTA: $Median_{gift} = \$30$ vs. $Median_{purchase} = \$25$; $B = .45$, $SE = .19$, $t(112) = 2.41$, $p = .02$), indicating that participants demanded a higher selling price for gifts than for purchases. When all previous analyses are run without these statistical controls, our results do not differ in any meaningful way. This is true for all of our studies.

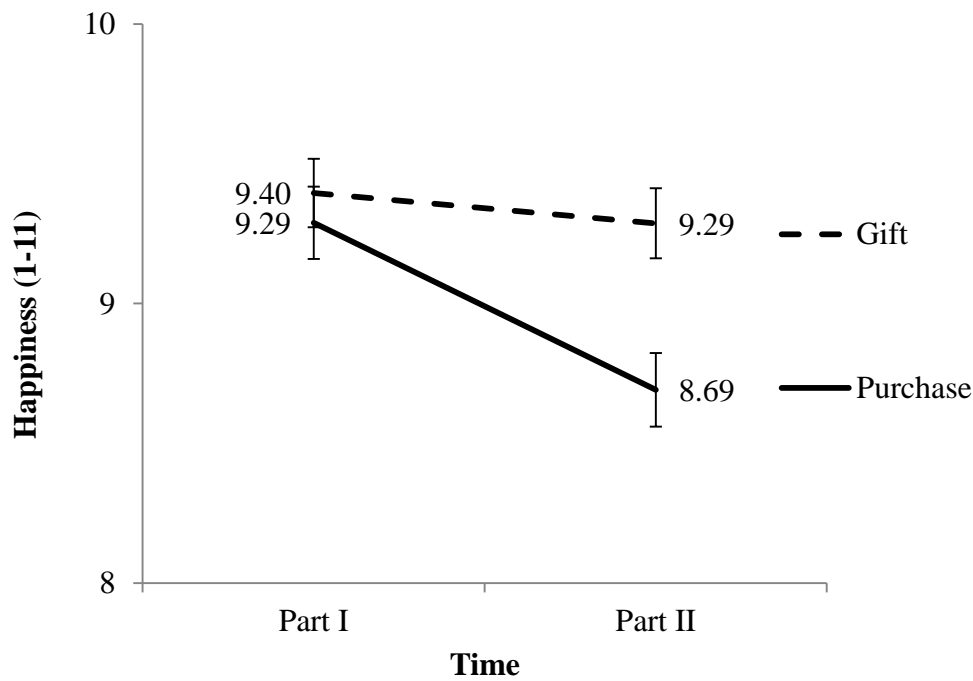


Figure 2: Initial and current happiness with gifts and purchases in Study 2.

Note—Error bars represent standard errors.

Mediation Analysis. To test the mediating role of sentimental value on the relationship between the source of the item and hedonic adaptation, we conducted two mediation analyses with clustered robust standard errors while controlling for category level dummy variables the natural log of cost and happiness measured at Part I. The first mediation analysis was performed using change in happiness as the dependent variable. Following Model 4 outlined by Hayes (2013), we found a direct effect of source (purchase vs. gift) on sentimental value ($B = .62$, $SE = .25$, $t(114) = 2.52$, $p = .013$), and a significant total effect of source on change in happiness ($B = .56$, $SE = .18$, $t(114) = 3.05$, $p = .003$). Importantly, when we added sentimental value to the model, the effect of source on change in happiness decreased ($B = .34$, $SE = .17$, $t(114) = 2.08$, p

= .04), whereas the effect of sentimental value on change in happiness remained significant ($B = .36, SE = .05, t(114) = 7.59, p < .001$). Finally, the bootstrap estimate (.20) for the overall model differed from zero at the 95% CI: [.07, .31], indicating that sentimental value partially mediated the effect of source on change in happiness with the items.

The second mediation analysis was performed using the natural log of WTA as the dependent variable. We found a direct effect of source (purchase vs. gift) on sentimental value ($B = .66, SE = .26, t(114) = 2.58, p = .01$), and a significant total effect of source on WTA ($B = .45, SE = .19, t(112) = 2.41, p = .02$). Importantly, when we added sentimental value to the model, the effect of source on WTA decreased ($B = .31, SE = .17, t(112) = 1.85, p = .07$), whereas the effect of sentimental value on WTA remained significant ($B = .26, SE = .05, t(112) = 5.35, p < .001$). Finally, the indirect effect (.17) for the overall model differed from zero at the 95% CI: [.07, .28], indicating that sentimental value mediated the effect of source on WTA of the items.

5.3 Discussion

The results of this study demonstrate the role that sentimental value plays in hedonic adaptation. Specifically, we observe that items individuals received as gifts tend to exhibit slower rates of hedonic adaptation as compared to similar items individuals purchased for themselves, because gifts are more sentimentally valuable. This study provides compelling evidence for the slowing role of sentimental value in hedonic adaptation, but it has two limitations. First, one may argue that the results of this study were driven by a demand characteristic: participants felt unwilling to state that their happiness with gifts decreased with time, even though it actually did. That is, participants may have felt awkward stating that a gift was no longer bringing them pleasure, because doing so might seem taboo (Tetlock, Kristel,

Elson, Green, & Lerner, 2000). To rule out this explanation, we conducted Studies 3A and 3B where none of the stimuli were gifts.

Second, though we tried our best to statistically control for item category, the observed effect on adaptation rate may still be due to differences in items and even item models (e.g. iPhone 4 vs. iPhone 5). These concerns are mitigated by the fact that sentimental value mediated the relationship between our independent variable and change in happiness, suggesting that even if the objects differed across conditions in terms of their typical adaptation rates, collapsing across conditions, sentimental value is still a strong predictor of hedonic adaptation. To further address these concerns, we conducted Studies 3A and 3B where we used identical stimuli in each condition.

6. STUDIES 3A AND 3B

Studies 3A and 3B serve four purposes. First, they test the generalizability of the findings of Study 2 by showing that the effect of sentimental value on hedonic adaptation is not limited to gifts (versus purchases) per se. Second, they help address the issue of demand characteristic in Study 2. Third, they employ a different method to control for the differences in stimuli. Instead of having independent coders sort items into different categories and statistically controlling for these categories, Studies 3A and 3B employed a yoked design to perfectly control for any differences in stimuli. In doing so, participants in the high sentimental value condition uploaded and viewed photos of places that had lots of sentimental value to them 6 times (10 seconds each time), whereas those in the low sentimental value condition viewed the same photos 6 times except that the photos had no sentimental value to them. Fourth, Studies 3A and 3B provide the

initial evidence that sentimental value does not decrease over time and that the associations with a significant other or with a special event or time in one's life underlie sentimental value and its influence on hedonic adaptation.

6.1 Study 3A

6.1.1 Method

Participants. Two hundred Americans (90 Females; $M_{\text{age}} = 34.66$, $SD = 11.65$) from the Amazon mTurk online panel completed a survey in exchange for \$1.0.

Procedure. All participants were told that they would view a photo a number of times in the study. Specifically, participants in the high sentimental value condition were instructed to think of a place that has a beautiful view and also has lots of sentimental value to them, find a photo that best represents that place on the internet and upload it to our program. To ensure participants clearly understand what sentimental value is, we offered our definition to everyone in this study. Because the fact that the place had sentimental value to people does not necessarily guarantee the specific photo they found on the internet had sentimental value, we asked participants whether the photo had sentimental value to them (Yes/No), and only allowed those who said "Yes" to proceed with the study. Next, they viewed the photo they had uploaded 6 times (10 seconds each time). After the first view and the last view, they indicated their real time happiness with the photo on two separate slider scales (0 = *Not happy at all*, 100 = *Very happy*), as well as the sentimental value of the photo on two separate slider scales (1 = *None at all*, 100 = *Very much*). Following the yoked control procedures, each participant in the low sentimental value condition was shown a photo uploaded by a corresponding participant in the high

sentimental value condition. Because the participants in the low sentimental value condition may have never known the places in the photos before, the photos were unlikely to have any sentimental value to them. However, in a few cases, the photos may happen to have high sentimental value to the participants in the low sentimental value condition as well if the photos featured places that elicited associations with participants' significant others or special events or time. Therefore, we asked participants in the low sentimental value condition whether the photo had sentimental value to them (Yes/No), and only allowed those who said "No" to proceed to view the photo 6 times and answered the same questions as those in the high sentimental value condition.

6.1.2 Results

Sentimental Value. Participants in the *high-sentimental value* condition reported that the item had more sentimental value than those in the *low-sentimental value* condition after both the first view ($M_{high\ sentimental\ value} = 86.05$ vs. $M_{low\ sentimental\ value} = 9.52$; $t(198) = 38.31$, $p < .001$), and the last view ($M_{high\ sentimental\ value} = 85.93$ vs. $M_{low\ sentimental\ value} = 9.60$; $t(198) = 36.59$, $p < .001$). Consistent with the temporal effect of sentimental value, sentimental value did not decrease with time in either condition (i.e., in the *high-sentimental value* condition: $M_{first\ rating} = 86.05$ vs. $M_{last\ rating} = 85.03$; $t(99) = .18$, $p = .86$; in the *low-sentimental value* condition: $M_{first\ rating} = 9.52$ vs. $M_{last\ rating} = 9.60$; $t(99) = .12$, $p = .90$; see Figure 3).

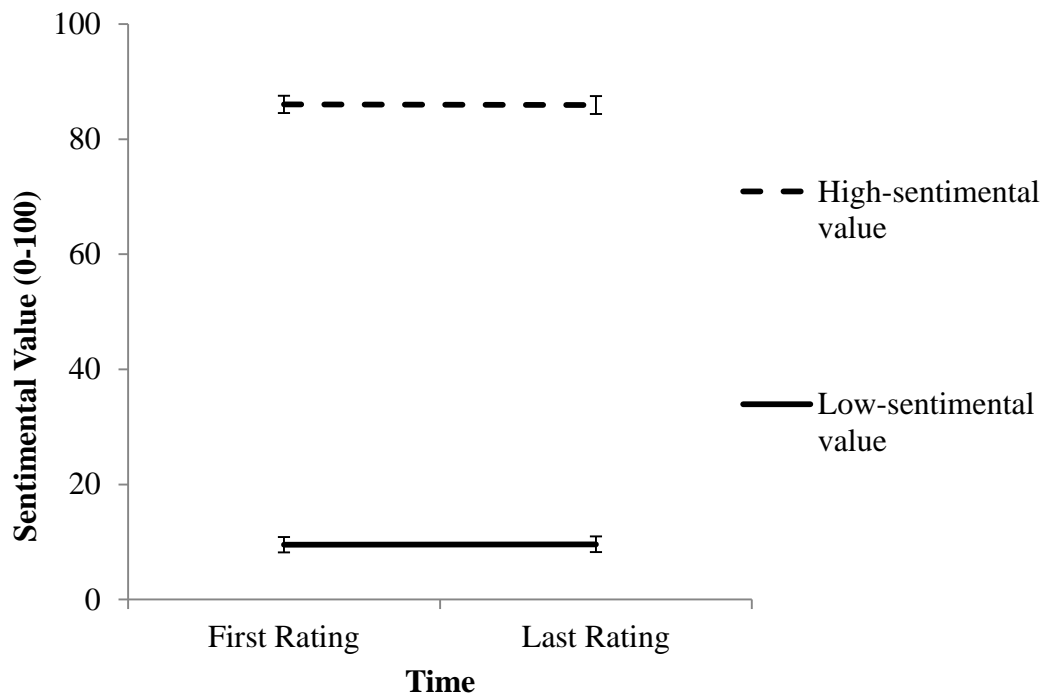


Figure 3: Sentimental value of the photo in Study 3A.

Note—Error bars represent standard errors.

Happiness. To determine the rate of hedonic adaptation, we subtracted the first happiness ratings from the last happiness ratings. This resulted in a measure of change in happiness across time and served as our measure of hedonic adaptation. Negative values represent decreases in happiness, while positive values represent increases in happiness. A linear regression of change in happiness on condition (0 = low sentimental value, 1 = high sentimental value) while controlling for the first happiness rating revealed a significant effect of condition ($M_{high\ sentimental\ value} = -1.77$ vs. $M_{low\ sentimental\ value} = -7.75$; $B = 4.14$, $SE = 2.08$, $t(197) = 2.00$, $p = .047$), indicating that participants in the high sentimental value condition adapted to photos more slowly than participants in the low sentimental value condition. As can be seen in the bottom panel of Figure

4, we found that happiness with photos significantly decreased over time among participants in the low sentimental value condition ($M_{first\ rating} = 59.71$ vs. $M_{last\ rating} = 51.96$; $t(99) = 5.32$, $p < .001$), whereas happiness with photos also decrease over time among participants in the high sentimental value condition but to a lesser extent ($M_{first\ rating} = 86.76$ vs. $M_{last\ rating} = 84.99$; $t(99) = 2.11$, $p = .038$).

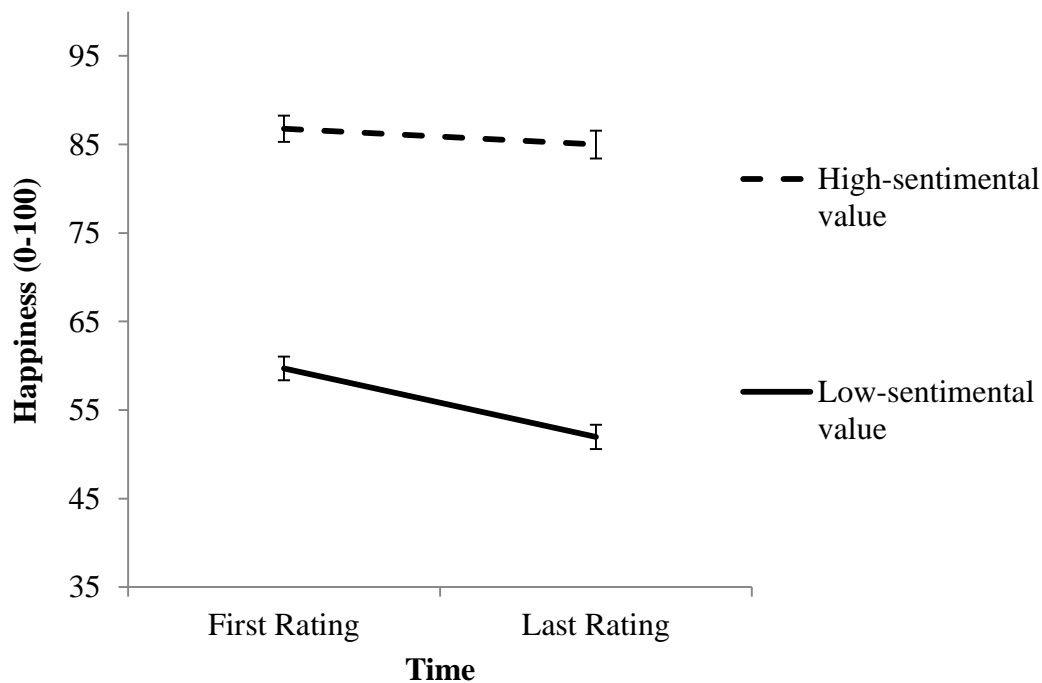


Figure 4: Happiness with the photo in Study 3A.

Note—Error bars represent standard errors.

Mediation Analysis. We conducted a mediation analysis to test whether sentimental value mediates the effect of the photo manipulation on hedonic adaptation while controlling for the first happiness rating. We used change in happiness as a dependent variable. Specifically, we

found a direct effect of the photo manipulation on sentimental value ($B = 68.86$, $SE = 2.42$, $t(197) = 28.36$, $p < .001$), and a significant total effect of the photo manipulation on change in happiness ($B = 4.14$, $SE = 2.08$, $t(197) = 2.00$, $p = .047$). Importantly, when we added sentimental value to the model, the effect of the photo manipulation was eliminated ($B = -3.50$, $SE = 4.65$, $t(196) = .75$, $p = .45$), whereas the effect of sentimental value on change in happiness was marginally significant ($B = .11$, $SE = .06$, $t(196) = 1.83$, $p = .068$). Finally, the indirect effect (7.65) for the overall model differed from zero at the 95% CI: [.44, 14.88], indicating that sentimental value fully mediated the effect of the photo manipulation on change in happiness with the photo.

6.2 Study 3B

6.2.1 Method

Participants. Two hundred Americans (93 Females; $M_{\text{age}} = 33.91$, $SD = 10.87$) from the Amazon mTurk online panel completed a survey in exchange for \$1.0.

Procedure. This study was a direct replication of Study 3A except for one major difference. To capture participants' spontaneous thoughts about the photo, immediately after the first view and the first happiness rating, we asked participants to list all the thoughts they had when they viewed the photo. At the end of the study, they were shown their own thoughts and asked to indicate whether their thoughts mentioned a significant other, a special event or time, and the features of the photo (i.e., quality, dimension and design of the photo, and the objects, places or views in the photo), respectively (1 = *None*, 4 = *A lot*).

6.2.2 Results

Sentimental Value. Participants in the *high-sentimental value* condition reported that the item had more sentimental value than those in the *low-sentimental value* condition after both the first view ($M_{high\ sentimental\ value} = 87.80$ vs. $M_{low\ sentimental\ value} = 17.92$; $t(198) = 27.59$, $p < .001$), and the last view ($M_{high\ sentimental\ value} = 87.63$ vs. $M_{low\ sentimental\ value} = 19.95$; $t(198) = 24.09$, $p < .001$). Consistent with the temporal effect of sentimental value, sentimental value did not decrease with time in either condition (i.e., in the *high-sentimental value* condition: $M_{first\ rating} = 87.80$ vs. $M_{last\ rating} = 87.63$; $t(99) = .26$, $p = .80$; in the *low-sentimental value* condition: $M_{first\ rating} = 17.92$ vs. $M_{last\ rating} = 19.95$; $t(99) = 1.59$, $p = .12$; see Figure 5).

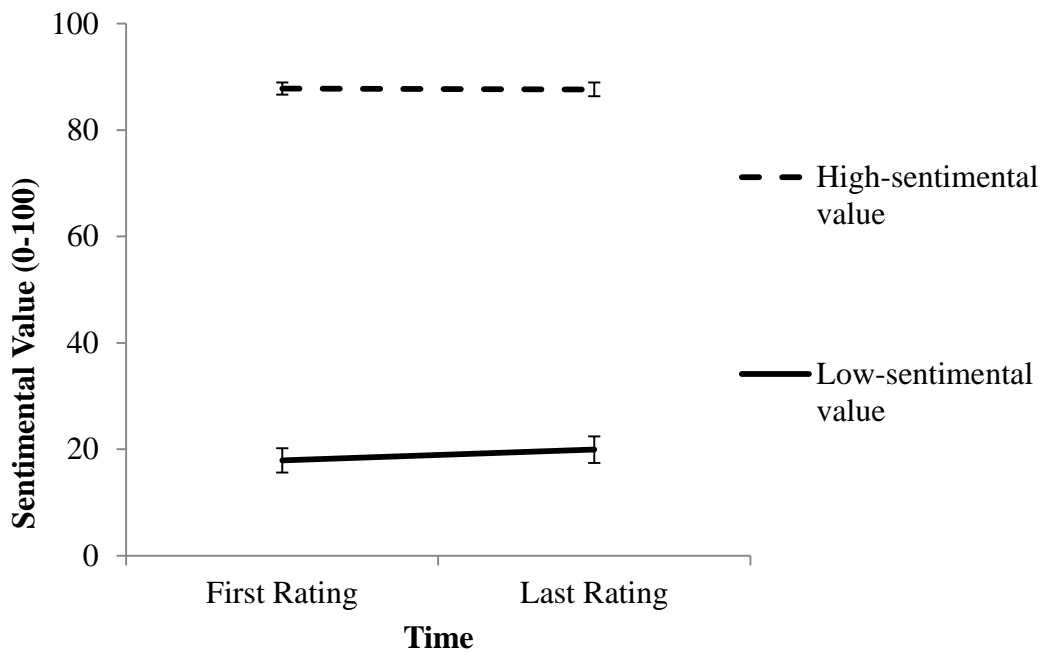


Figure 5: Sentimental value of the photo in Study 3B.

Note—Error bars represent standard errors.

Happiness. To determine the rate of hedonic adaptation, we subtracted the first happiness ratings from the last happiness ratings. This resulted in a measure of change in happiness across time and served as our measure of hedonic adaptation. Negative values represent decreases in happiness, while positive values represent increases in happiness. A linear regression of change in happiness on condition (0 = low sentimental value, 1 = high sentimental value) while controlling for the first happiness rating revealed a significant effect of condition ($M_{high\ sentimental\ value} = -2.22$ vs. $M_{low\ sentimental\ value} = -5.38$; $B = 4.97$, $SE = 2.24$, $t(197) = 2.22$, $p = .028$), indicating that participants in the high sentimental value condition adapted to photos more slowly than participants in the low sentimental value condition. As can be seen in the bottom panel of Figure 6, we found that happiness with photos significantly decreased over time among participants in the low sentimental value condition ($M_{first\ rating} = 63.99$ vs. $M_{last\ rating} = 58.61$; $t(99) = 3.49$, $p = .001$), whereas happiness with photos also decrease over time among participants in the high sentimental value condition but to a lesser extent ($M_{first\ rating} = 90.34$ vs. $M_{last\ rating} = 88.12$; $t(99) = 2.44$, $p = .016$).

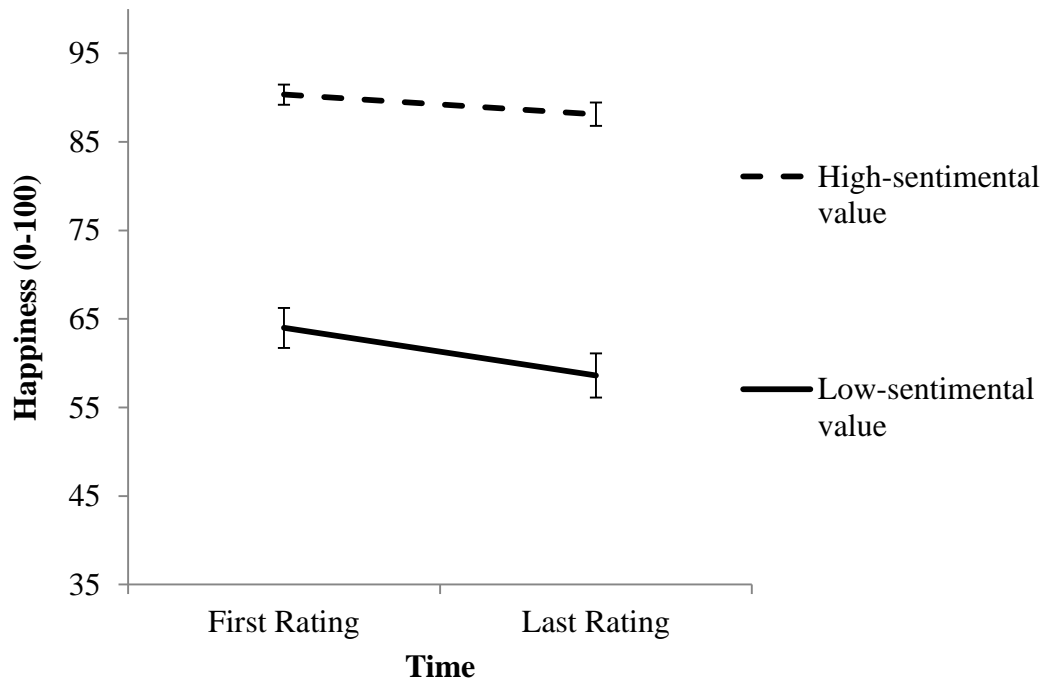


Figure 6: Happiness with the photo in Study 3B.

Note—Error bars represent standard errors.

Thoughts. To understand participants' spontaneous thoughts about the photos, we asked participants to list all the thoughts they had when they saw the photo and then rated to what extent their thoughts were related to a significant other, a special event or time, and features of the photo, respectively. A 2 (Photo: high-sentimental value vs. low-sentimental value) x 3 (Thoughts: related to a significant other vs. a special event or time vs. features) mixed ANOVA revealed a significant *Photo x Thoughts* interaction, $F(1, 198) = 66.54, p < .001$. Consistent with our hypothesis, the photos in the *high-sentimental value* condition were associated more with significant others ($M_{high} = 2.84$ vs. $M_{low} = 1.28; t(198) = 11.21, p < .001$), with special events or

time ($M_{high} = 2.63$ vs. $M_{low} = 1.39$; $t(198) = 8.57$, $p < .001$), and less with features ($M_{high} = 2.09$ vs. $M_{low} = 2.69$; $t(198) = 3.94$, $p < .001$) than in the *low-sentimental value* condition.

Mediation Analysis. We predict that association related thoughts and sentimental value fully mediates the effect of the photo manipulation on the change in happiness. That is, participants in the high sentimental value condition generated more association related thoughts (i.e., thoughts related to a significant other or thoughts related to a special event), which leads to a higher rating of sentimental value and thus a slower rate of hedonic adaptation. In testing so, we conducted a two stage mediation analysis following Model 6 outlined by Hayes (2013) while controlling for the first happiness rating. As can be seen in Figure 7, we found a direct effect of the photo manipulation on association related thoughts ($B = 1.15$, $t(197) = 7.98$, $p < .001$), a direct effect of the number of association related thoughts generated on sentimental value ($B = 5.11$, $t(196) = 3.08$, $p = .002$), and a direct effect of the photo manipulation on sentimental value ($B = 54.99$, $t(196) = 14.21$, $p < .001$). More importantly, though the total effect of photo manipulation on change in happiness was significant ($B = 4.97$, $t(197) = 2.22$, $p = .028$), this effect dropped below the conventional level of significance ($B = -5.32$, $t(195) = 1.52$, $p = .13$) when the number of association related thoughts ($B = -1.77$, $t(195) = 1.63$, $p = .10$) and sentimental value ($B = .20$, $t(195) = 4.46$, $p < .001$) were added to the model. Finally, the bootstrap estimates for two indirect paths differ from zero. Specifically, one indirect effect passes through both association related thoughts and sentimental value, and has a value of 1.19, with a 95% BC confidence interval of .35 to 2.63. The other indirect effect carries the effect of the photo manipulation on change in happiness through sentimental value only, and has a value of 11.13, with a 95% BC confidence interval of 3.58 to 19.91.

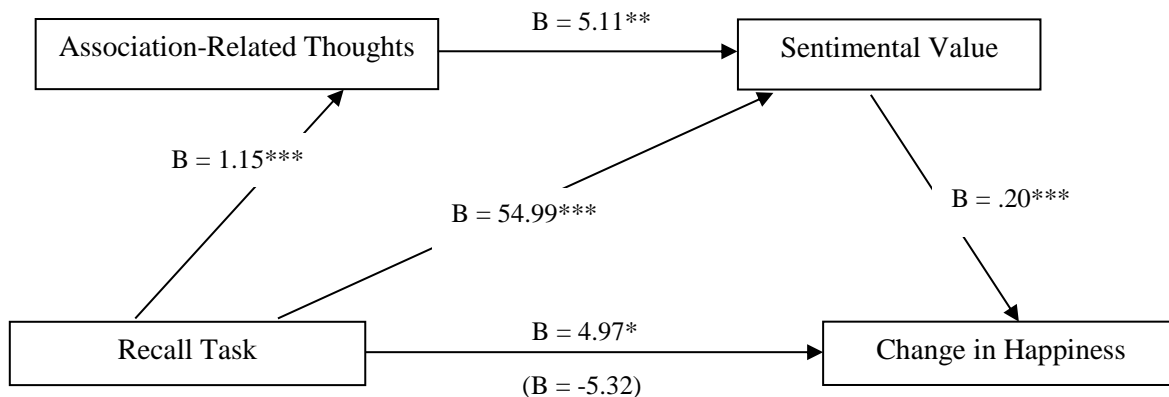


Figure 7: Mediation analysis, Study 3B.

Note—Photo manipulation coded as 1 = high sentimental value, 0 = low sentimental value; * $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed)

6.3 Discussion

Studies 3A and 3B replicated the slowing effect of sentimental value on hedonic adaptation by comparing people's happiness with photos that have high sentimental value versus photos that do not over a short period of time (minutes). Specifically, we found that people adapt to photos of sentimentally valuable places more slowly than to photos of sentimentally valueless places. Moreover, these two studies provided initial evidence that sentimental value did not tend to fade over time and that the associations with a significant other or with a special event or time in one's life underlie sentimental value and its influence on hedonic adaptation.

Studies 3A and 3B also helped address the limitations of Study 2. First, this study ruled out demand as an alternative explanation. Unlike Study 2, the stimuli in this study were not gifts, but photos taken by an anonymous person and found on the internet. Therefore, it is highly

unlikely that reporting a decrease in happiness was more of a taboo in one condition than in the other. Second, this study held the photos constant across conditions by employing a yoked procedure, so the slowing effect of sentimental value on hedonic adaptation cannot be due to visual differences in photos.

7. STUDY 4

Studies 3A and 3B tested the slowing effect of sentimental value on hedonic adaptation over a rather short period of time (minutes). Will the effects hold over a longer period of time? To answer this question, we conducted Study 4, which consisted of three parts implemented over a span of nine months. Specifically, Study 4 experimentally manipulated sentimental value of an item by manipulating the person with whom the item was associated. During the first part, participants received a gift either from their romantic partner or from the experimenter. We predict that gifts from a romantic partner will be more sentimentally valuable than those from the experimenter and that this increased sentimental value will lead to slower rates of hedonic adaptation as measured three months and even nine months later. This approach allows us to control for the item in question while experimentally manipulating the degree of sentimental value the item has.

7.1 Method

Fifty-seven heterosexual romantic couples ($M_{\text{age}} = 20.55$, $SD = .83$) from a large Chinese University participated in a “personality survey” in exchange for 3 *yuan* (around \$0.50 USD) and a gift. In order to recruit as many student couples as possible, study ads were posted on numerous bulletin boards around campus. In addition, research assistants actively approached

students who looked like couples on campus and informed them of the study. We then scheduled individual sessions with each couple who was interested in participating. The study consisted of three parts.

Part I. Each romantic couple arrived at the lab together, but each member of the couple was seated at opposite ends of the room with dividers separating them in order to ensure that their responses would not be influenced by one another. They were then instructed to complete a 33-item personality test which consisted of 30 filler questions from the Big Five Personality Inventory (John, Donahue, & Kentle, 1991) and three additional questions which measured the strength of their romantic relationship. Specifically, they indicated to what extent they agree or disagree with the following statements: “I am in a very stable relationship with my partner,” “I rarely fight/argue with my partner,” and “I feel very happy when I am with my partner” (1 = *Extremely disagree*, 9 = *Extremely agree*.)

Next, each participant was told that in addition to their fee for showing up, they would receive an item as thanks for participating in the study. The way in which this item was given to them, however, varied as a function of condition. Specifically, participants in the *low-sentimental value* condition were told: “Thank you for your participation. You also get a reward.” Each male participant was then given a calendar toy and each female participant was given a man-made grass toy (see Appendix E).

In contrast, participants in the *high-sentimental value* condition were told: “Thank you for your participation. You also get an opportunity to choose between two gifts.” The gifts were placed inside two opaque boxes labeled “for myself” and “for my partner”. Participants could not see inside the boxes, nor did they know what was inside. All they knew was that there were two

different types of items. They were further told that they could either get a gift for themselves (the one inside the “for myself” box”) or give a gift to their partner (the one inside the “for my partner” box), but not both. To ensure that participants in both conditions received the same item, male participants in the *high-sentimental value* condition always had the calendar toy in the box labeled “for myself” and the grass toy in the box labeled “for my partner,” and female participants always had the opposite. This way, if both participants chose to have their partners receive the gift, men would always receive the calendar toy and women would always receive the grass toy, just like participants in the *low-sentimental value* condition. It is worth noting that participants were unaware of what their partners were doing throughout the entire study, so a participant’s decision to either get a gift for themselves or to give it to their partner was made prior to knowing if their partner chose the gift for themselves or opted to give the gift to their partner.

Depending on the choices made by the participants, one of three scripts was followed. First, if both participants chose to give the gift to their partner, the experimenter asked them to both simultaneously walk to the middle of the room to exchange gifts and said, “Both of you have chosen the gifts for your partners rather than for yourselves. Now, please take a moment and give your gifts to your partners.” Then, the male participant handed the grass toy to the female participant and the female participant handed the calendar toy to the male participant. Second, if one participant chose the gift for him- or herself, and the other participant chose the gift for his or her partner, the experimenter told the participant who chose the gift for the self to leave the gift in his or her cubicle, and then walk to the middle of the room to accept the gift from his or her partner. To eliminate any suspicion that one’s partner chose the gift for him- or herself, which may negatively influence their relationship, the experimenter told the participants

that the questionnaires they completed were different. In this situation, the participant who received no gifts (i.e., he or she chose to give a gift to his or her partner while the partner chose to get a gift for him- or herself) would receive the item as a reward from the experimenter. Third, if both participants chose the gift for themselves, there would be no gift exchange. Participants would stay in their cubicles during the entire session.

Next, regardless of condition, all participants privately indicated how happy they were with the item that they received (1 = *Not happy at all*, 9 = *Very happy*). For those who received more than one gift, they reported their happiness with both gifts. Finally, all participants answered a few demographic questions and were told that the experimenter would contact them when a follow-up survey was available, and, by completing the follow-up survey, they would earn an opportunity to win 100 yuan (around \$16 USD). No questions about sentimental value were asked during this part.

Part II. The second part of the study was conducted three months after the first part. The experimenter called each participant and scheduled a time and location for the follow-up survey. To ensure a high response rate, we allowed participants to pick any locations convenient to them as long as the location was quiet and private. Most participants completed this part in a classroom, the library, or their dormitory (all students live in on-campus housing offered by the university). All 114 participants completed Part II and did so individually (i.e., their romantic partner was not present). Participants indicated whether they still possessed the item, how happy they were with the item on the same scale as in Part I, the sentimental value of the item (1 = *None at all*, 9 = *Very much*), and the lowest amount of money they would accept to sell the item

(WTA). Finally, they again answered the three questions about the quality of their relationship asked in Part I.

Part III. The third part of the study was conducted via telephone six months after Part II. Participants were recruited with the promise of entry into a lottery for an *iPod Shuffle*. Of the 114 individuals who completed parts I and II, we were able to collect 51 (45%) responses for Part III. The response rate was low because many participants graduated a few months after Part II and changed their cellphone numbers after they found jobs in different cities in order to avoid being charged long distance rates (a common practice in China). In addition, a few participants who did not change their numbers refused to take the survey for different reasons. In Part III, participants indicated their happiness with the gift, sentimental value of the gift, and whether they still possessed the gift (all on the same scales as used before). They also answered a few other questions which were part of a different research project.

7.2 Results of Part I and Part II

We first report the results of Parts I and II. Three couples were no longer in committed relationships by the time of the second part of the study took place (one in the *high-sentimental value* condition, two in the *low-sentimental value* condition). During the first part, among the 28 couples who were in the *high-sentimental value* condition, both members of 26 of the couples chose to give the gift to their partner. Two couples had one participant who chose for the partner, and one who chose for the self. We excluded these two couples from the subsequent analyses. We also excluded one participant who no longer possessed the gift. These exclusions resulted in usable data from 51 individuals in the high-sentimental value condition and 58 individuals in the low-sentimental value condition. Importantly, these exclusions had no substantive effects on the

interpretation of any of our results. Regardless, we chose to exclude the participants from the analyses to be as conservative as possible. In this study, because participants received different gifts depending on their gender, we statistically controlled for the type of gifts in all our analyses. Moreover, because participants' responses may be correlated with their partners' responses, we conducted all the analyses using regression with clustered robust standard errors to allow for the possibility that partner responses were correlated.

Sentimental Value. We first regressed sentimental value on gift source (0 = from the experimenter, 1 = from the partner) and the gift dummy variable (0 = man-made grass toy; 1 = calendar toy) with clustered robust standard errors. We observed a significant effect of source ($M_{romantic\ partner} = 8.31$ vs. $M_{experimenter} = 6.41$; $B = 1.90$, $SE = .29$, $t(54) = 6.62$, $p < .001$), indicating that gifts received from romantic partners had higher sentimental value than gifts received from the experimenter.

Happiness. A regression of change in happiness on gift source (0 = from the experimenter, 1 = from the partner), the gift dummy variable and happiness measured at Part I with clustered robust standard errors revealed a significant effect of source ($M_{romantic\ partner} = -.18$ vs. $M_{experimenter} = -1.45$; $B = 1.63$, $SE = .25$, $t(54) = 6.46$, $p < .001$), indicating that participants' happiness with gifts from their partners faded more slowly than with gifts from the experimenter. As can be seen in Figure 8, although the happiness with items from the experimenter significantly decreased over time ($M_{Part\ I} = 8.21$ vs. $M_{Part\ II} = 6.76$; $t(57) = 5.74$, $p < .001$), the happiness with gifts from their partners did not ($M_{Part\ I} = 8.73$ vs. $M_{Part\ II} = 8.55$; $t(50) = 1.22$, $p = .23$).

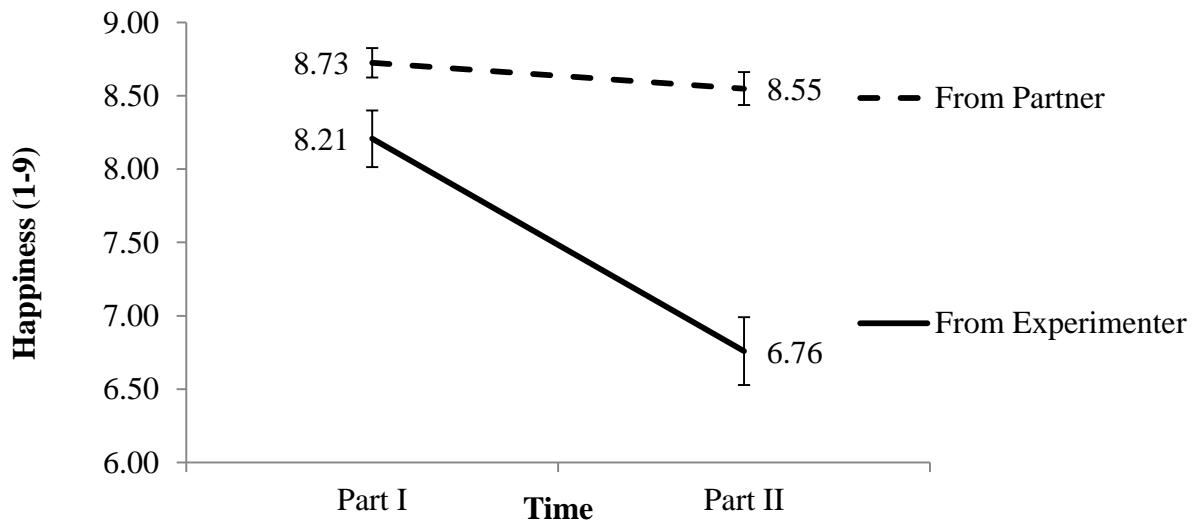


Figure 8: Initial and current happiness with items of participants who completed both Part I and Part II in Study 4.

Note—Error bars represent standard errors.

WTA. Despite not being a response option, many participants reported that they would not be willing to sell their item at any price. Accordingly, we analyzed these data in two ways. First, we compared the percentage of participants who did not want to sell the item across conditions. Significantly more participants in the high sentimental condition (45.1%) said that they did not want to sell the item than those in the low sentimental condition (17.2%), $\chi^2(1) = 9.98, p = .002$). In other words, participants who received gifts from their romantic partner were far less willing to part with the gift at any price, as compared to those who received the item from the experimenter. Second, we performed a log transformation on the WTA indicated by participants who were willing to sell the item, and then regressed it on source (0 = from the experimenter, 1 = from the partner) and the gift dummy variable with clustered robust standard

errors. The results revealed a significant effect of source ($Median_{romantic\ partner} = 350\ yuan$ (~\$40.32) vs. $Median_{experimenter} = 20\ yuan$ (~\$3.23); $B = 3.02$, $SE = .78$, $t(47) = 3.85$, $p < .001$), indicating that participants demanded a higher selling price for the gifts from their partners than for the rewards from the experimenter.

Other Measures. The measure of relationship strength indicated that the couples were generally in very good relationships (Part I: $M_{romantic\ partner} = 7.10$ vs. $M_{experimenter} = 7.34$; $t(107) = .91$, $p = .37$; Part II: $M_{romantic\ partner} = 7.51$ vs. $M_{experimenter} = 7.30$; $t(107) = .78$, $p = .44$). To examine the change in relationship strength, we subtracted Time 1 relationship strength ratings from Time 2 relationship strength ratings. A linear regression of this new measure on source and the gift dummy variable revealed no significant effect, indicating that the change in relationship strength did not differ across conditions.

Mediation Analysis. We conducted two mediation analyses to test whether sentimental value mediates the effect of source on hedonic adaptation. First, we conducted regressions with clustered robust standard error (while controlling for the gift dummy variable and happiness measured at Part I) using change in happiness as a dependent variable. Although there is a direct effect of gift source on sentimental value ($B = 1.64$, $SE = .27$, $t(54) = 6.03$, $p < .001$), and a direct effect of sentimental value on change in happiness ($B = .22$, $SE = .09$, $t(54) = 2.35$, $p = .02$), sentimental value does not mediate the effect of gift source on change in happiness. As a secondary analysis, we conducted regressions with clustered robust standard error (while controlling for the gift dummy variable) using the natural log of WTA as dependent variable. Specifically, we found a direct effect of gift source on sentimental value ($B = 1.90$, $SE = .29$, $t(54) = 6.62$, $p < .001$), and a significant total effect of gift source on WTA ($B = 3.02$, $SE = .78$, $t(47) =$

3.85, $p < .001$). Importantly, when we added sentimental value to the model, the effect of gift source decreased ($B = 2.18$, $SE = .73$, $t(47) = 2.98$, $p = .005$), whereas the effect of sentimental value on WTA remained significant ($B = .45$, $SE = .12$, $t(49) = 3.71$, $p = .001$). Finally, the indirect effect (.85) for the overall model differed from zero at the 95% CI: [.36, 1.05], indicating that sentimental value partially mediated the effect of gift source on WTA of the items.

7.3 Results of Part I, Part II and Part III

We next report the results based on participants who completed all three parts of the study. As discussed before, our exclusion criteria yielded usable data from 51 participants in the high-sentimental value condition and 58 participants in the low-sentimental value condition in the first two parts. Among these participants, 48 participants completed Part III (27 from the high-sentimental value condition and 21 from the low-sentimental value condition). One of these participants did not possess the gift anymore and thus was excluded from subsequent analyses, resulting in 47 usable responses.

Sentimental Value. Participants in the *high-sentimental value* condition reported that the item had more sentimental value than those in the *low-sentimental value* condition, both during Part II ($M_{romantic\ partner} = 8.31$ vs. $M_{experimenter} = 6.95$; $t(45) = 3.03$, $p = .004$), and Part III ($M_{romantic\ partner} = 8.35$ vs. $M_{experimenter} = 6.90$; $t(45) = 2.81$, $p = .007$), indicating that the manipulation successfully changed sentimental value over a 9 month period. Consistent with the temporal effect of sentimental value, sentimental value did not decrease with time in either condition (i.e., when from the partner: $M_{Part\ II} = 8.31$ vs. $M_{Part\ III} = 8.35$; $t(25) = .17$, $p = .87$; when from the experimenter: $M_{Part\ II} = 6.95$ vs. $M_{Part\ III} = 6.90$; $t(20) = .07$, $p = .94$; see Figure 9).

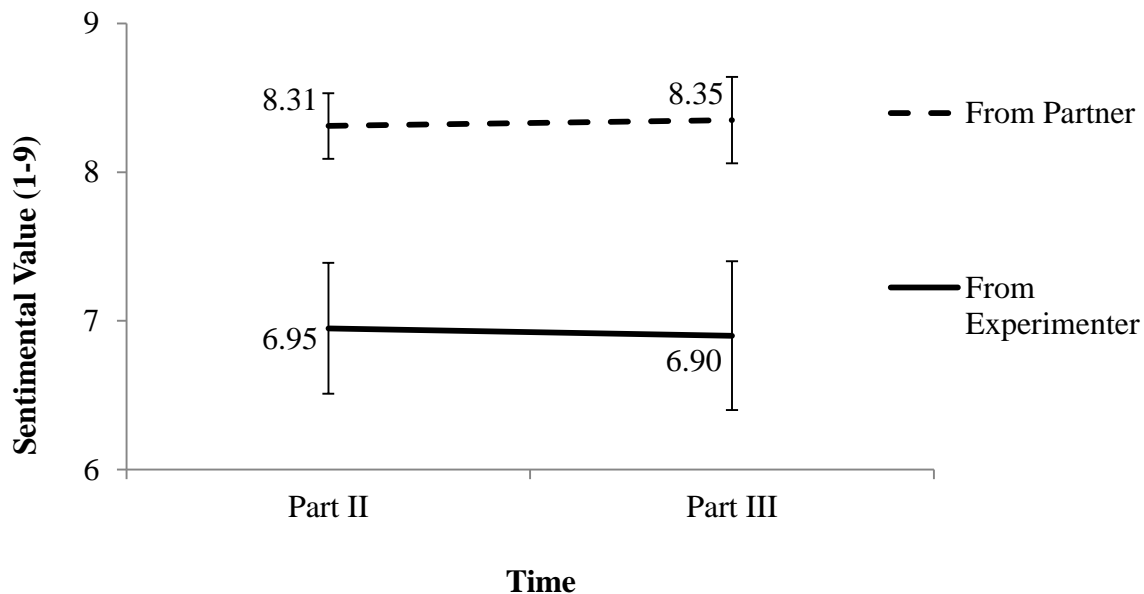


Figure 9: Sentimental value measured at Part II and Part III by participants who completed all three parts in Study 4.

Note—Error bars represent standard errors.

Happiness. A regression of change in happiness on gift source (0 = from the experimenter, 1 = from the partner), the gift dummy variable (0 = man-made grass toy; 1 = calendar toy) and happiness measured at Part I with clustered robust standard errors, revealed a significant effect of source ($M_{romantic\ partner} = -.50$ vs. $M_{experimenter} = -1.62$; $B = 1.13$, $SE = .45$, $t(33) = 2.52$, $p = .017$), indicating that participants' happiness with gifts from their partners faded more slowly than with gifts from the experimenter, even over 9 months. This was true despite the fact that happiness with the item significantly decreased over time in both conditions (when from the partner: $M_{Part\ I} = 8.69$ vs. $M_{Part\ III} = 8.19$; $t(25) = 2.69$, $p = .013$; when from the experimenter: $M_{Part\ I} = 8.67$ vs. $M_{Part\ III} = 7.05$; $t(20) = 3.89$, $p = .001$; see Figure 10).

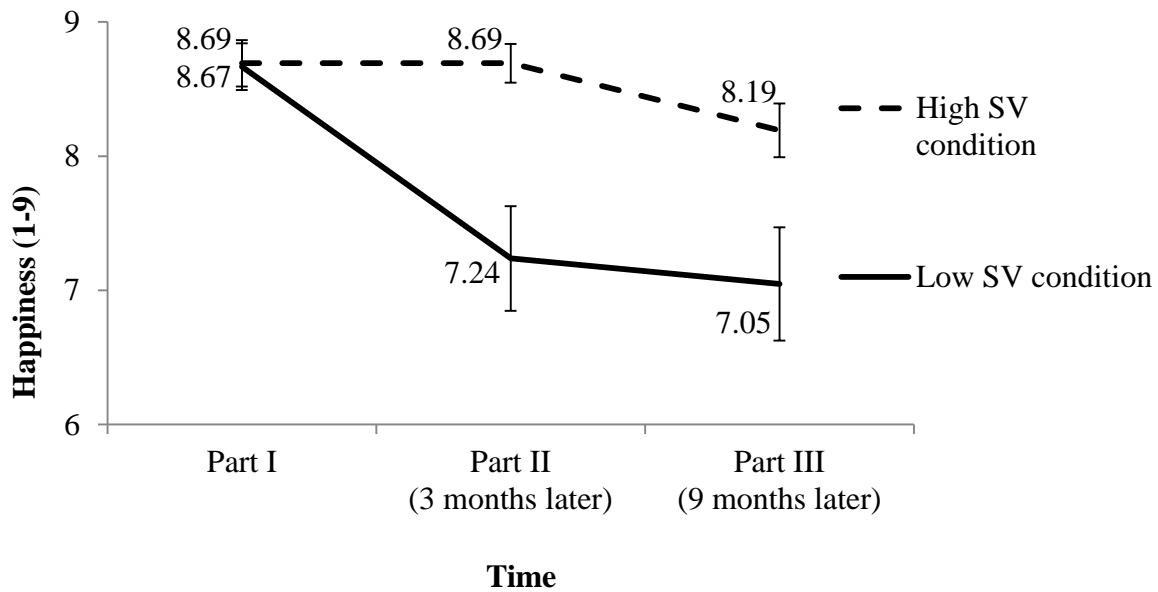


Figure 10: Initial and current happiness with items of participants who completed all three parts in Study 4.

Note—Error bars represent standard errors.

7.4 Discussion

This study further demonstrates the mitigating role that sentimental value has on hedonic adaptation. Unlike Studies 2 and 3, Study 4 uses a paradigm where we imbue an item with sentimental value in the lab rather than ask participants to list items that tend to have high sentimental value (e.g., gifts or purchases that commemorate a special event). Moreover, consistent with our theorizing, sentimental value is invariant across a 6-month period (Part II to Part III), and the influence of sentimental value on hedonic adaptation spans at least 9 months.

8. STUDY 5

This study has two objectives. First, it aims to replicate all previous findings with items consumers naturally own in everyday life. Second, as aforementioned, we propose that happiness with an item is a weighted sum of feature-related utility and sentimental value. Study 5 tests how these two factors simultaneously influence happiness with an item over time. Specifically, we predict that sentimental value typically does not decrease over time, and that the magnitude of sentimental value moderates the influence of feature-related utility on happiness with an item. That is, even though feature-related utility decreases over time for all items, such a decrease will have a smaller influence on happiness for items that have high sentimental value than for items that have low sentimental value. Said otherwise, sentimental value acts as a buffer against the negative influence of the decrease in feature-related utility on happiness with items.

8.1 Method

Participants. Two hundred and thirty five Americans (111 Females; $M_{\text{age}} = 32.57$, $SD = 10.88$) from the Amazon mTurk online panel completed a survey in exchange for \$0.50.

Procedure. Participants were randomly assigned to recall a durable item that was worth at least \$50 and made them happy when they acquired it. Specifically, participants in the high sentimental value condition were instructed to recall an item that had lots of sentimental value to them at the time when they acquired it. Those in the low sentimental value condition were instructed to recall an item that had no sentimental value to them at the time when they acquired it and ever since. To ensure participants clearly understand what sentimental value is, we offered

our definition to everyone in this study. All participants then provided a brief description of the item.

Next, we measured how happy participants were with the item when they first acquired it and at present on two separate scales (1 = *Not happy at all*, 7 = *Very happy*), and the order of the two questions was counterbalanced. Different order did not yield significantly different results and thus was not further discussed in subsequent analyses. To capture participants' spontaneous thoughts about the item, we asked participants to list all the thoughts they typically had when they used, saw, or thought about the item. On the next page, they were shown their own thought and asked to indicate whether their thoughts mentioned any person who was a significant other to them, any special events or time to them, and any product features of the item, respectively (1 = *None*, 4 = *A lot*). Then, participants indicated how much sentimental value the item had to them both when they acquired it and at present on two separate scales (1 = *Not at all*, 7 = *Very much*). They also indicated how much feature-related utility the item had to them both when they acquired the item, and at present. Specifically, to ensure that participants understood the questions, we provided them with a definition of feature-related utility ("Feature-related value is value derived from product features (e.g., the appearance, functions, and specifications") and then asked them two questions: "At the time you acquired this item, how much feature-related value (as opposed to sentimental value) did this item have to you?", and "Right now, how much feature-related value (as opposed to sentimental value) did this item have to you?" They answered each question on a 7-point scale (1 = *None at all*, 7 = *Very much*).

Finally, participants reported how they acquired the item (1 = I bought it, 2 = I received it from others, 3 = other), the cost of the item, how long ago they acquired the item, and the

product category of the item (by choosing from the eight final categories listed in Appendix B). At the end, to check whether participants paid attention to the instructions, they indicated whether they were instructed to recall an item that had lots of sentimental value when they acquired it or no sentimental value.

8.2 Results

Seventeen participants answered the attention check question incorrectly and therefore were excluded from the subsequent analyses. Not excluding them does not meaningfully change the results.

Items. There was a significant difference between conditions in what items participants recalled ($\chi^2(7) = 53.18, p < .001$; see Appendix C), as well as a significant difference between conditions in the length of ownership ($M_{high} = 79.81$ months vs. $M_{low} = 26.30$ months; $t(216) = 6.06, p < .001$). Because the cost of the items was skewed, we performed a log transformation and used the natural log of the cost in our data analysis. There was no significant difference in transformed cost (untransformed cost: $Median_{high} = \$200.00$ vs. $Median_{low} = \$162.50$; $t(215) = 1.30, p = .20$). In the subsequent analyses we statistically control for the category level dummy variables, length of ownership, and the natural log of cost.

Sentimental Value. Participants in the *high-sentimental value* condition reported that the item had more sentimental value than those in the *low-sentimental value* condition, both at the time they acquired the item ($M_{high} = 5.90$ vs. $M_{low} = 1.44$; $t(216) = 24.34, p < .001$), and at the time they participated in the study ($M_{high} = 6.55$ vs. $M_{low} = 1.72$; $t(216) = 33.57, p < .001$). To examine the change in sentimental value, we subtracted the sentimental value ratings at

acquisition from the sentimental value ratings at present. A linear regression of this new measure on the recall tasks (0 = low-sentimental value item, 1 = high-sentimental value item), the category level dummy variables, length of ownership, and the natural log of cost, revealed no significant effect of the recall task ($M_{high} = .65$ vs. $M_{low} = .28$; $B = .26$, $SE = .24$, $t(206) = 1.08$, $p = .28$), indicating that sentimental value did not change differently over time across conditions. Specifically, sentimental value for items that had high sentimental value at acquisition actually *increased* with time ($M_{at\ acquisition} = 5.90$ vs. $M_{at\ present} = 6.55$; $t(109) = 3.98$, $p < .001$), so did sentimental value for items that had low sentimental value at acquisition ($M_{at\ acquisition} = 1.44$ vs. $M_{at\ present} = 1.72$; $t(107) = 2.32$, $p = .02$; see Figure 11).

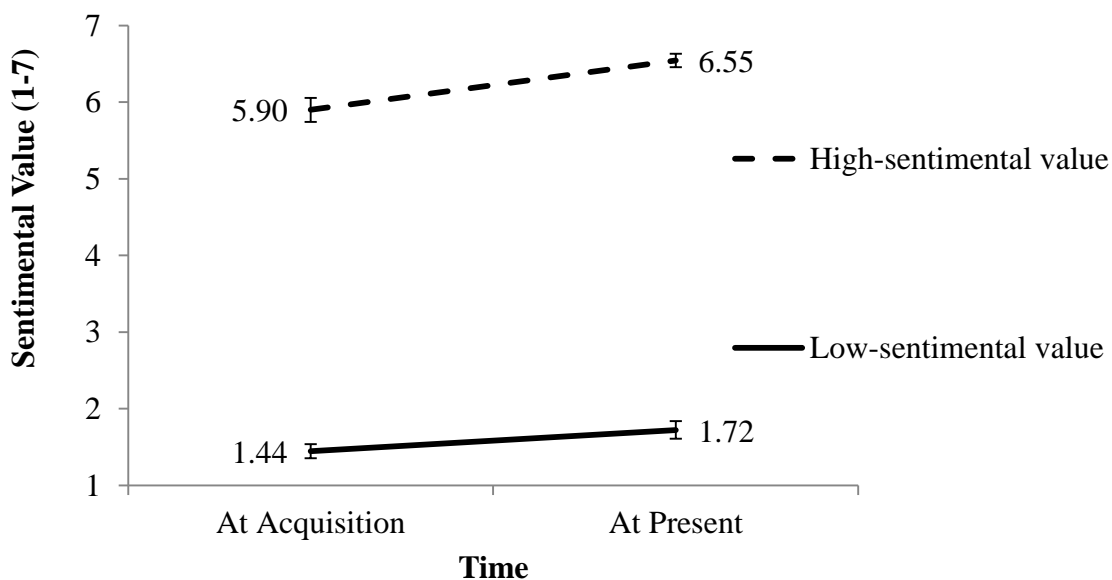


Figure 11: Initial and current sentimental value of items in Study 5.

Note—Error bars represent standard errors.

Happiness. A linear regression of change in happiness on the recall tasks (0 = low-sentimental value item, 1 = high-sentimental value item), category level dummy variables, length of ownership, the natural log of cost and happiness at acquisition, revealed a significant effect of recall tasks ($M_{high} = -.20$ vs. $M_{low} = -.98$; $B = .91$, $SE = .17$, $t(205) = 5.49$, $p < .001$), indicating that participants adapted more slowly to highly sentimentally valuable items than to less sentimentally valuable items. As can be seen in Figure 12, happiness with low-sentimental items decreased over time ($M_{at\ acquisition} = 6.16$ vs. $M_{at\ present} = 5.18$; $t(107) = 8.50$, $p < .001$), whereas happiness with high-sentimental items decreased to a lesser extent ($M_{at\ acquisition} = 6.65$ vs. $M_{at\ present} = 6.45$; $t(109) = 2.12$, $p = .04$).

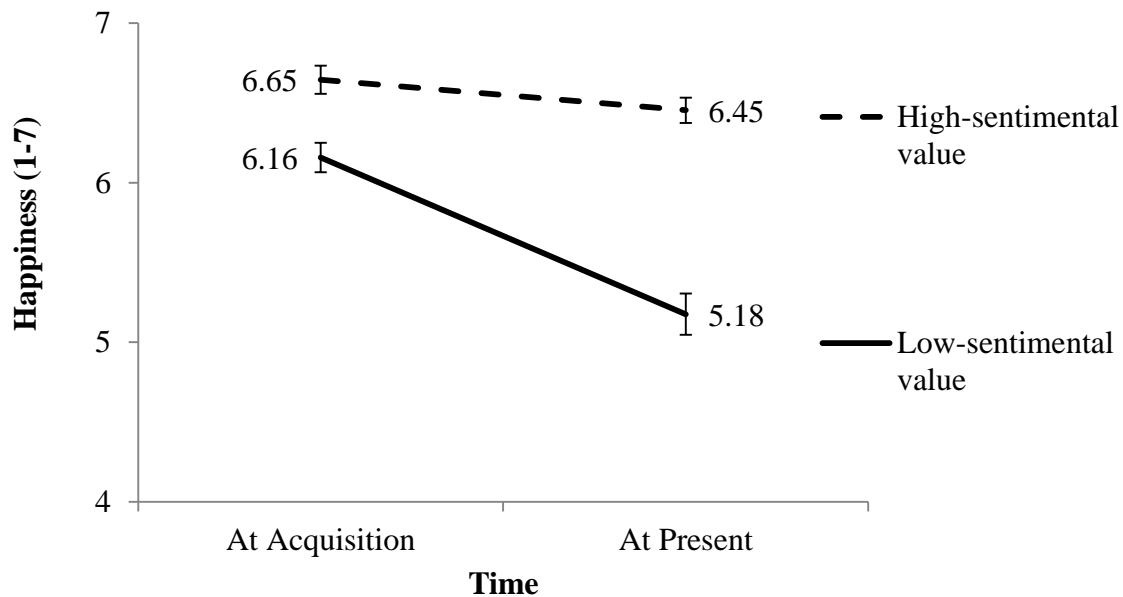


Figure 12: Initial and current happiness with items in Study 5.

Note—Error bars represent standard errors.

Thoughts. To understand participants' spontaneous thoughts about the item, we asked participants to list all the thoughts they had when they saw, used or thought about the item and then rated to what extent their thoughts were related to a significant other, special event or time, and product features, respectively. A 2 (Recall: high-sentimental value item vs. low-sentimental value item) x 3 (Thoughts: related to a significant other vs. a special event or time vs. product features) mixed ANCOVA (controlling for the category level dummy variables, length of ownership, and the natural log of cost) revealed a significant *Recall* x *Thoughts* interaction, $F(1, 206) = 67.29, p < .001$. Consistent with our hypothesis, the thoughts in the *high-sentimental value* condition were associated more with significant others ($M_{high} = 3.02$ vs. $M_{low} = 1.18$; $t(216) = 14.15, p < .001$), with special events or time ($M_{high} = 2.35$ vs. $M_{low} = 1.07$; $t(216) = 10.64, p < .001$), and less with product features ($M_{high} = 1.70$ vs. $M_{low} = 2.33$; $t(216) = 4.78, p < .001$) than those in the *low-sentimental value* condition.

Feature-Related Utility. A linear regression of change in feature-related utility on the recall task (0 = low-sentimental value item, 1 = high-sentimental value item), the category level dummy variables, length of ownership, and the natural log of cost, revealed no significant effect of recall task ($M_{high} = -.40$ vs. $M_{low} = -.45$; $B = -.08, SE = .23, t(206) = -.35, p = .73$), indicating that feature related utility did not change differently across conditions. As can be seen in Figure 13, feature related utility significantly decreased over time for both the high-sentimental items ($M_{at\ acquisition} = 4.60$ vs. $M_{at\ present} = 4.20$; $t(107) = 3.56, p = .001$) and the low-sentimental items ($M_{at\ acquisition} = 6.30$ vs. $M_{at\ present} = 5.85$; $t(109) = 2.71, p = .008$).

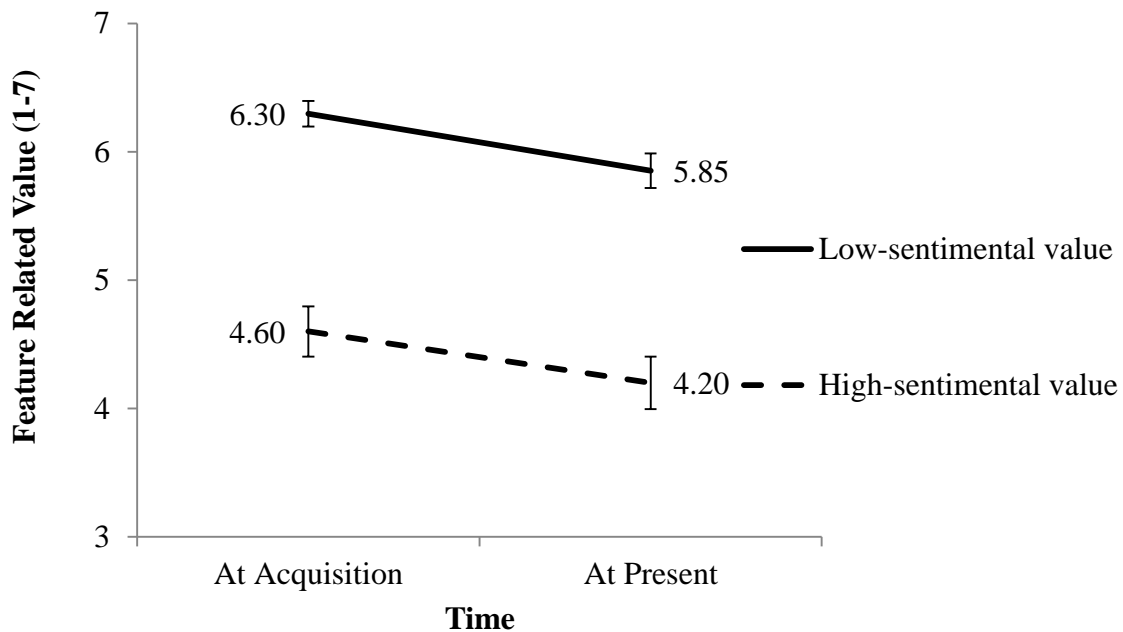


Figure 13: Initial and current feature related utility in Study 5.

Note—Error bars represent standard errors.

Mediation and Moderation Analysis. We made three primary predictions for the effects of sentimental value and feature-related utility on hedonic adaptation. First, association related thoughts and sentimental value fully mediates the effect of the recall task on the change in happiness. Specifically, the more sentimental value an item had when people acquired it, the more association related thoughts (i.e., thoughts related to a significant other or thoughts related to a special event) it elicits now, the more sentimental value the item has now, and the less a person adapts to it. Second, in general, the greater the decrease in feature-related utility over time, the more a person will hedonically adapt to it. Third, the magnitude of sentimental value moderates the influence of feature-related utility on happiness with an item. That is, even though feature-related utility decreases with time, happiness is less susceptible to such a decrease if the

item has high sentimental value (versus low sentimental value). We lay out this model formally in Figure 14, and simultaneously test these predictions with a series of multiple regressions. Importantly, in testing this model, we mean centered sentimental value and change in feature-related utility to facilitate the interpretation of the regression coefficients and eliminate multicollinearity (Cohen, Cohen, West, & Aiken, 2013). Also, as mentioned earlier, we controlled for the category level dummy variables, length of ownership, and the natural log of cost in all our analyses.

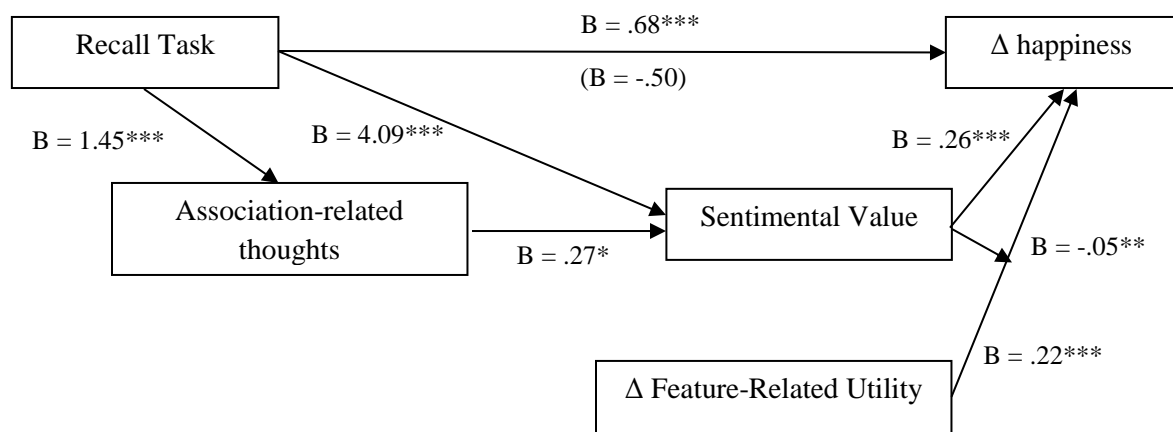


Figure 14: Mediation and moderation analysis, Study 5.

Note—Recall task coded as 1 = high sentimental value, 0 = low sentimental value; * $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed)

Results showed that all three predictions were supported. First, we conducted a two stage mediation analysis following Model 6 outlined by Hayes (2013). We found a direct effect of recall task (high-sentimental item vs. low-sentimental item) on association related thoughts ($B =$

1.45, $t(203) = 12.58$, $p < .001$), a direct effect of the number of association related thoughts generated on sentimental value ($B = .27$, $t(202) = 2.54$, $p = .01$), and a direct effect of recall task on sentimental value ($B = 4.04$, $t(202) = 17.36$, $p < .001$). More importantly, though the total effect of recall task on change in happiness was significant ($B = .88$, $t(203) = 5.60$, $p < .001$), this effect dropped below the conventional level of significance ($B = -.46$, $t(201) = 1.46$, $p = .15$) when the number of association related thoughts ($B = .01$, $t(201) = .07$, $p = .95$) and sentimental value ($B = .30$, $t(201) = 5.00$, $p < .001$) were added to the model. Finally, the bootstrap estimates for two of three indirect paths differ from zero. Specifically, one indirect effect passes through both association related thoughts and sentimental value, and has a value of .12, with a 95% BC confidence interval of .04 to .26. The other indirect effect carries the effect of recall task on change in happiness through sentimental value only, and has a value of 1.21, with a 95% BC confidence interval of .82 to 1.80.

Second, we found that the greater the decrease in feature-related utility of an item, the more participants adapted to it ($B = .21$, $t(201) = 4.69$, $p < .001$). Finally, the effect of change in feature-related utility on hedonic adaptation was moderated by the level of sentimental value ($B = -.05$, $t(201) = 2.96$, $p = .004$). That is, when sentimental value is low, change in feature-related utility is highly associated with hedonic adaptation, but when sentimental value is high, the influence of feature-related utility on hedonic adaptation is mitigated. We can also examine the simple correlation between change in feature-related utility and change in happiness by condition. Doing so, we found a strong positive correlation in the low sentimental value condition ($r = .43$, $p < .001$, the larger the decrease in feature-related utility, the larger the decrease in happiness), but no correlation in the high sentimental value condition ($r = .11$, $p = .25$). The difference in correlations was significant ($z = 2.54$, $p = .01$).

Sources of Acquisition. Studies 2-4 demonstrated that the influence of sentimental value on hedonic adaptation was robust to both gifts and non-gifts. To further test that sentimental value's influence on hedonic adaptation is not limited to only one such source (e.g. gifts), we examined participants' responses to how they acquired the item in this study. Specifically, the percentages of purchases, gifts and other sources was 28.2%, 70.0%, and 1.8%, respectively, in the high-sentimental value condition, and 88.9%, 10.2% and 0.9%, respectively, in the low-sentimental value condition. Though there was a significant difference in the proportion of acquisition types across conditions ($\chi^2(2) = 83.09, p < .001$), we did not find a difference in the influence of sentimental value on hedonic adaptation across gifts and purchases ($B = -.37, SE = .43, t(201) = .85, p = .40$). That is, the influence of sentimental value on adaptation remains statistically significant for both gifts ($B = .90, SE = .36, t(77) = 2.53, p = .013$) and purchases ($B = .66, SE = .25, t(116) = 3.49, p = .01$).

8.3 Discussion

This study confirms our hypothesis by directly showing that objects with high sentimental value at acquisition indeed tend to elicit more association-related thoughts than objects with little sentimental value. These association-related thoughts contribute to the formation of sentimental value and slow the process of hedonic adaptation. Moreover, it lends support to our hypothesis and demonstrates that sentimental value typically does not decrease over time, and that the more sentimentally valuable an object is, the less influence the decrease in feature-related utility has on happiness with the object. In other words, sentimental value buffers the detrimental effect of the reduction in feature-related utility on happiness: the same decrease

in feature-related utility led to a smaller drop in happiness with high-sentimental value items than with low-sentimental value items.

9. GENERAL DISCUSSION

Sentimental value is a highly prevalent phenomenon in individuals' daily lives. This paper defined, presented antecedents to, and demonstrated meaningful consequences (slowing hedonic adaptation) of this rich construct. We first show that sentimental value is a function of associations with significant others and/or associations with special events and that people have a shared understanding of this definition (Studies 1A and 1B). We next demonstrate that objects that are high in sentimental value lead to considerably slower rates of hedonic adaptation as compared to objects that are low in sentimental value (Studies 2-5) over periods of time as long as 9-months (Study 4). We show that this is the case because strong associations with significant others and/or associations with special events lead to sentimental value which in turn slows adaptation. Moreover, we show that, though feature-related utility decreases with time for all objects, sentimental value usually does not, and that the more an object is sentimentally valuable, the smaller is the impact of the decrease in feature-related utility on hedonic adaptation (Study 5). In all, we introduce a highly relevant construct to psychology and marketing literature and document a strong and reliable effect across a number of stimuli.

9.1 Theoretical Implications and Future Research

The current research joins a growing body of literature identifying important factors that influence hedonic adaptation (Bar-Anan et al., 2009; Carter & Gilovich, 2010, 2012; Galak et al., 2013; Kurtz et al., 2007; Nelson & Meyvis, 2008; Nicolao et al., 2009; Redden, 2008; Temple et

al., 2008; Van Boven & Gilovich, 2003; Wilson et al., 2005; Wilson et al., 2000). However, whereas previous research on hedonic adaptation focused on how item features influence hedonic adaptation, the present research explores how a form of non-feature related utility influences hedonic adaptation. Though, as aforementioned, sentimental value is a highly relevant and important construct, it is surely not the only form of non-feature related utility that could influence hedonic adaptation. In fact, recent research seems to suggest that other types of non-feature-related utility may also influence hedonic adaptation but through very different processes. For example, value from social identity may slow hedonic adaptation as people satiate more slowly to identity-consistent versus neutral items when the focal identity has been activated due to cognitive dissonance (Chugani, Irwin, & Redden, 2014). For example, students may enjoy a t-shirt with the logo of their university because it reminds them of events and friends at school, and/or because it reflects who they are. The former would be closer to sentimental value, while the latter would be closer to identity signaling. Though identity signaling is clearly a form of non-feature related utility, the mechanism by which it influences hedonic adaptation is quite different from how sentimental value influences hedonic adaptation. One of our hopes for this paper is to open the door to future researchers to identify other important forms of non-feature related utility and how they influence important constructs such as happiness.

The present work is also related to recent research regarding purchasing goods versus experiences (Carter & Gilovich, 2010, 2012; Nicolao et al., 2009; Rosenzweig & Gilovich, 2011; Van Boven, 2005). In a nationally representative survey, 57% of respondents indicated that they were happier with an experiential purchase than with a material purchase, while only 34% of respondents indicated the opposite (Van Boven & Gilovich, 2003), suggesting that, if trying to maximize happiness, people should spend more on experiences than on material possessions.

Though we agree with this general finding, we wonder if this conclusion should be tempered with the notion that some items, those which are sentimentally valuable, may indeed yield long lasting happiness. To the extent that people have the ability to purchase items that have sentimental value they may be just as well off as if they had spent that money on experiences. Indeed, recent research along this line suggests that purchasing a material item to commemorate (versus an experience to celebrate) an event may even lead to more vivid memories and stronger positive affect associated with a special event or achievement over a long period of time (Dalton, Goodman, & Malkoc, 2014).

The present research is also related to the debate about whether gift-giving is an efficient enterprise. In 2010, Americans spent \$228.4 billion during major national holidays on gifts for their friends and loved ones. Gifts account for 47.2% of total holiday spending, and gift cards made up one fifth of gift sales (Beeck, 2010). However, it is unclear whether gift-giving is a utility maximizing endeavor. For instance, it is easy to imagine that a gift giver is less attuned to the preferences of the gift recipient than the recipient is to her own preferences. This deadweight loss in gift giving (Waldfogel, 1993) can result in an inefficient transfer of utility from the gift giver to the gift recipient. That is, a gift giver spending \$100 on a gift that is suboptimal for the recipient would have been better off, in a financial sense, giving the recipient the \$100 in cash and having the recipient purchase something for herself. In this way, the recipient would best match the \$100 with her preferences. There is, however, some debate as to whether this deadweight loss exists (List & Shogren, 1998; Solnick & Hemenway, 1996). Regardless, our research is agnostic as to whether the immediate effect of gift giving is efficient. Rather, our work sheds light on the long term effect of gift giving. That is, even if gifts result in lower initial utility (something we do not observe in our data), in the long run, our results suggest that gifts,

because of their sentimental value, will result in higher utility (happiness, in our research) than mere cash exchanges. Accordingly, even if gifts result in a deadweight loss, that loss is likely to be short-lived.

Though we provide a definition useful for studying sentimental value, there are many unanswered questions that are left to future research. First, as mentioned earlier, an object can acquire sentimental value due to its associations with a significant other or/and with a special event or time in one's life, yet not all items associated with the same person or event exhibit the same levels of sentimental value. For instance, a heart shaped pendant given by a husband to his wife clearly has sentimental value. However, a printer given by the same husband to the same wife likely does not. Though the giver and recipient were both the same, the object, for some reason, varies with regard to how much sentimental value it possesses. What are the factors that explain such differences? Though only preliminary, we have some evidence suggesting that item type may be one predictor of sentimental value. In a separate study ($N = 112$), among other things, we asked participants to imagine that they received one of four items as gifts during the holiday season (a Kindle, a mug, a backpack, and a watch) and indicate the sentimental value that each item would have to them ($1 = \textit{Not at all}$, $7 = \textit{Very much}$). Interestingly, there were significant differences in sentimental value across items, ranging from 3.46 (backpack) to 5.07 (watch), indicating that item type may be one predictor, among many others, of sentimental value. Related to this, in our Study 1B we found a significant negative correlation between the amount of sentimental value and functional value that important objects possess. Though, again, merely speculative, perhaps the more an object is functional in nature the less likely it is to be sentimentally valuable. Whereas the necklace from the example above has limited functional

value and is likely highly sentimentally valuable, the printer is highly functional and thus may be less likely to be sentimentally valuable.

Second, the downstream consequences of sentimental value are largely unknown. For example, how does sentimental value influence decision making? On the one hand, previous research suggests that people who previously had a high sentimental value item may strategically avoid acquiring an identical item in order to protect the memory or status of the original item (Zauberman et al., 2009). On the other hand, the sentimental value of the original item may have positive effects that carry over to duplicate similar items or even to the brand of the item. That is, perhaps the Nike shoes worn by the runner who won her first race somehow cause other Nike shoes to also hold similar associations. To the extent that the new item (other Nike shoes) also evokes the same associations as the original item, there is no theoretical reason that sentimental value couldn't, in a sense, spill over from one object to another.

9.2 Practical Implications

Aside from the theoretical contributions outlined above, this research has important practical implications both for consumers and for marketers. For consumers, a straight forward implication is that controlling the circumstances surrounding product acquisitions can have dramatic impact on the longevity of enjoyment with a product. Specifically, consumers can increase sentimental value of purchases by controlling the timing, location, and individuals with whom they make these purchases. To the extent that rich associations with significant others and/or special events can be actively established for products, consumer wellbeing is likely to benefit, and for potentially long periods of time. For example, a lamp purchased on a random day for home may have no sentimental value, but a lamp purchased on a birthday may have high

sentimental value; a mug purchased at a local store may have no sentimental value, but a mug purchased on a vacation with family may have high sentimental value. In both of these cases, if sentimental value can be maximized, the lamp and the mug may bring joy to the consumer for far longer. By knowing the antecedents to sentimental value and changing purchasing behaviors to capitalize on those antecedents, consumers can prolong happiness with products.

Finally, this work has practical implications for marketing managers. Specifically, firms should be careful when attempting to imbue objects with sentimental value. Though an object is likely to be loved longer by consumers if it is sentimentally valuable, such an object is also likely to be disposed of later on, thus reducing repeat purchases. For instance, if Apple creates sentimental value for a purchased iPhone, though the consumer may enjoy their phone longer, they may be less likely to purchase the next generation model because the sentimental value of the original one slowed hedonic adaptation. However, to the extent that firms do choose to imbue an item with sentimental value, they can do so by offering promotions that coincide with special events or times in a consumer's life. For instance, MINI already does this via a college graduate program and offers a \$500 cash discount for new college graduates. Presumably, the idea is that college graduates will not just be more likely to buy a MINI due to the price promotion, but will also associate the car with graduation, a special time in their life. If so, then, perhaps, this sentimental value will exist not just for the specific car that they purchased, but, if as aforementioned, sentimental value can transfer from a product to a brand, they will have sentimental value for the MINI brand itself. Though they may hold on to this particular car longer, when it eventually does become time to purchase a new car, they may be more likely to buy a MINI.

9.3 Limitations

Though the results of our experiments are consistent and robust, this work has several limitations that should be considered. First, two of our studies (Studies 2 and 5) asked participants to self-report objects. Though we control for the variations in these reported objects (e.g., category level dummy variables, cost, and length of ownership) in our analyses, there is still the possibility that reported items differed in some way that we could not observe. For this reason, we conducted Studies 3A, 3B and 4 where we held the objects the same across conditions, imbued them with sentimental value and observed the effects over time. Given how consistent the relationship between sentimental value and hedonic adaptation is across all of our studies, we do not feel that this limitation is overwhelming.

Second, a plausible explanation for the results of our studies that involve gifts is social desirability bias: participants felt unwilling to state that their hedonic response to gifts decreased with time, even though it actually did. That is, participants may have felt awkward stating that a gift from a loved one was no longer bringing them pleasure because doing so would seem taboo (Tetlock et al., 2000). Though we agree that this is possible, this concern is limited because we also observe our effect for non-gifts which are not susceptible to such social desirability bias (Studies 3A, 3B and 5). A social desirability explanation for all of our results would not only need to explain how it is taboo to report decreases for sentimentally gifts, but also taboo to indicate decreases for objects that were not gifts. Given this, we find a social desirability explanation of our results unlikely.

Third, in most of our studies, objects that have higher sentimental value also have higher initial ratings of happiness. Therefore, an alternative explanation of our effect is that objects that

have higher initial happiness ratings are less likely to adapt to than those that have lower initial happiness ratings. To rule out this explanation, we included the initial happiness as a covariate in regressions whenever hedonic adaptation was involved and showed that our effect held in all cases. In fact, we often found a strong negative relationship between initial happiness with an object and change in happiness, such that the higher the initial happiness rating an object has, the greater is the decrease in happiness over time. This observation is also consistent with recent work showing that greater liking leads to greater satiation (DePaoli & Khan, 2014).

Finally, though we took great care to measure hedonic adaptation across a range of time periods (1 minute in Studies 3A and 3B, 45 days in Study 2 to approximately 9 months in Study 4), it is possible that the benefit that sentimental value provides to people diminishes over *very* long time periods. Though we doubt this to be the case given that we saw no evidence of a decrease in sentimental value with time when the underlying associations remained intact, future research is needed to understand the duration with which sentimental value persists.

9.4 Coda

There are many prescriptions for how people should step off the metaphorical “hedonic treadmill” (Brickman & Campbell, 1971). We provide another, easily actionable way in which people can remain happy with the things that they have: invest in sentimental experiences that imbue objects with sentimental value. Because the benefit from sentimental value seems to seldom fade, doing so may be a way to stave off the detrimental influences of hedonic adaptation.

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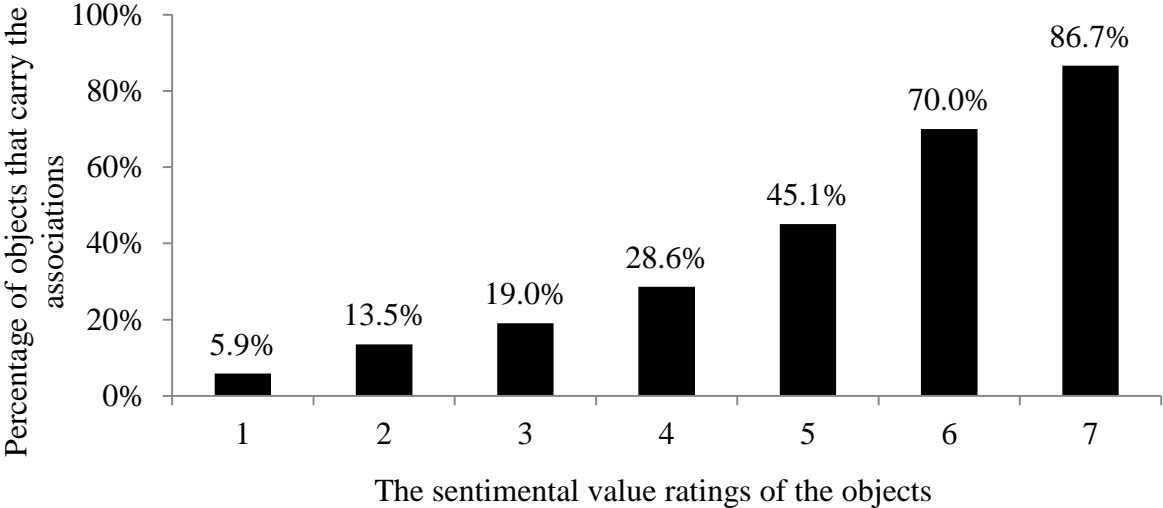
FOOTNOTES

¹In accordance with the suggestions made by Simmons, Nelson, and Simonsohn (2011), we report all measures collected and all levels of independent variables across all of our experiments. We also do not exclude any participants without reporting our reasoning. Finally, we use covariates consistently across all of our experiments and excluding covariates does not meaningfully change our results.

APPENDIX A

Results of Study 1B

Associations either with a special event or time or a significant other



APPENDIX B

Item Categorization Details

Original Category	Original Subcategory	Frequency	% of Items	Final Category
Book	-	19	4.7%	Books, Movies, Music, and Video Games
Books, Movies, Music, and Video Games*	-	6	1.5%	
Car or Car Accessories	Car	0	0%	Car or Car Accessories
	Car Accessory	5	1.2%	
Clothing and Clothing Accessories	Clothing Accessories	24	5.9%	Clothing and Clothing Accessories
	Footwear	20	4.9%	
	General Clothing	90	22.1%	
	Handbag	4	1.0%	
Electronics	Electronic Accessories	31	7.6%	Electronics and Electronic Accessories
	Electronics	19	4.7%	
	Video Game	19	4.7%	Books, Movies, Music, and Video Games
	Video Game System	3	0.7%	
Game or Toy	General Game or Toy	18	4.4%	Sporting Equipment, Musical Instruments, and Games (not Video Games)
	Musical Instrument	0	0%	
Household Item	General Household Item	81	19.9%	Household Item
	Toiletry	21	5.2%	
	Tool	12	2.9%	
Jewelry	-	13	3.2%	Jewelry
Other	-	8	2.0%	Other
Sporting Equipment, Musical Instruments, and Games (not Video Games)*	-	4	1.0%	Sporting Equipment, Musical Instruments, and Games (not Video Games)
Stationery	-	10	2.5%	Household Item
Total		407	100.00%	

*Note: “Books, Movies, Music, and Video Games” and “Sporting Equipment, Musical Instruments, and Games (not Video Games)” were added by the third, non-Amazon mTurk coder, and were not shown to mTurk coders during the categorization task.

APPENDIX C

Categories of items by conditions in Studies 2 and 5.

Category	Study 2				Study 5			
	Gifts		Purchases		High SV		Low SV	
	Count	% Within Condition	Count	% Within Condition	Count	% Within Condition	Count	% Within Condition
Books, Movies, Music, and Video Games	33	12.80%	14	9.40%	7	6.4%	10	9.3%
Car or Car Accessories	3	1.20%	2	1.30%	3	2.7%	4	3.7%
Clothing and Clothing Accessories	98	38.00%	40	26.80%	8	7.3%	13	12.0%
Electronics and Electronic Accessories	23	8.90%	27	18.10%	21	19.1%	51	47.2%
Household Item	76	29.50%	48	32.20%	13	11.8%	16	14.8%
Jewelry	9	3.50%	4	2.70%	39	35.5%	1	.9%
Other	6	2.30%	2	1.30%	5	4.5%	6	5.6%
Sporting Equipment, Musical Instruments, and Games (not Video Games)	10	3.90%	12	8.10%	14	12.7%	7	6.5%
Total	258	100.00%	149	100.00%	110	100.0%	108	100.0%

Notes: The items of Study 2 are the items participants still possessed at the time of Part II.

APPENDIX D

Percentage of Change in Happiness in All Studies

		Change in happiness			Pearson Chi-Square	<i>p</i> - value
		Decrease	No change	Increase		
Study 2	Gift	28.7%	48.8%	22.5%	10.37	.01
	Purchase	44.3%	39.6%	16.1%		
Study 3A	High-sentimental value	36.0%	33.0%	31.0%	5.85	.05
	Low-sentimental value	53.0%	24.0%	23.0%		
Study 3B	High-sentimental value	40.0%	33.0%	27.0%	10.07	.01
	Low-sentimental value	60.0%	16.0%	24.0%		
Study 4 (Part I and Part II)	Gift from partner	27.5%	60.8%	11.8%	24.33	< .001
	Gift from experimenter	60.3%	29.3%	10.3%		
Study 5	High-sentimental value	25.5%	67.3%	7.3%	33.29	< .001
	Low-sentimental value	63.0%	29.6%	7.4%		

APPENDIX E

Stimuli from Study 4. Male participants received the calendar toy (on the left), and female participants received the man-made grass toy (on the right).

