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Subjective well-being, social buffering and hedonic editing in the quotidian

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A previous study on the relationship between subjective well-being (SWB) and hedonic editing—the process of mentally integrating or segregating different events during decision-making—showed that happy individuals preferred the social-buffering strategy more than less happy individuals. The present study examined the relationship between SWB, social-buffering and hedonic outcomes in daily life. In Study 1, we used web-based diaries to measure the frequency with which individuals utilised social and non-social buffers as well as daily levels of happiness. Consistent with the previous finding, happy individuals utilised social buffers more frequently than less happy individuals. Interestingly, the utilisation of social buffers had a positive effect on daily happiness among all participants, regardless of individuals' levels of SWB. In Study 2, we found that although the use of social buffers yielded similar effects across groups on online evaluations of events, happy individuals showed a positive bias in global evaluations of past events. This finding suggests that how one construes and remembers the outcomes of social buffering may shape the different hedonic editing preferences among happy and less happy individuals.

Keywords: Happiness; Subjective well-being; Social buffering; Hedonic editing; Decision-making.

That we are not quite as competent as we would ideally like to be in terms of making decisions that maximise our happiness is an oft-reached conclusion in the field of decision-making (Hsee & Hastie, 2006; Hsee, Hastie, & Chen, 2008). Frequently, our sub-optimal decisions stem from inaccurate forecasts of the hedonic impact of various events (e.g., Hsee & Zhang, 2004; Loewenstein, O'Donoghue, & Rabin, 2003; Schkade & Kahneman, 1998; Wilson & Gilbert, 2005). The behavioural decision-making literature chronicles a host of biases and errors to which people are prone when making hedonic predictions (Hsee & Hastie, 2006; Loewenstein & Schkade, 1999), and hedonically inefficient decisions are a natural corollary of such inaccurate predictions. However, this raises an interesting question: "are there people who are better at maximizing their hedonic experiences (i.e., making themselves happy), and if so, who?" We believe the answer to this question is yes and propose that happy individuals, compared to less happy individuals, may be better at making

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hedonically optimal choices that lead to better hedonic outcomes. The present article aims to examine this idea in the context of hedonic editing (Thaler, 1985), the process of mentally integrating or segregating different events to maximise hedonic outcomes during decision-making. In particular, the present study focuses on the relationship between subjective well-being (SWB) and "social buffering", a hedonic editing strategy that involves integrating positive social events with negative events (Linville & Fischer, 1991; Sul, Kim, & Choi, 2013).

SOCIAL BUFFERING AS A HEDONIC EDITING STRATEGY

Hedonic editing refers to the process of mentally integrating or segregating experiences to maximise the utility, or happiness, during decision-making (Thaler, 1985). We experience various negative and positive events in our lives and how one chooses to arrange these events in time produces different hedonic outcomes (Hsee & Leclerc, 1998; Linville & Fischer, 1991; Mellers, 2000; Thaler, 1985, 1999; Thaler & Johnson, 1990). For example, suppose that you received a harsh review for a manuscript that you submitted to an academic journal (event 1) and that you have the opportunity to hang out with a close friend (event 2). Would you choose to meet up with your friend on the same day or would you allow some time to pass before meeting up with your friend? Although the desirability of each event would stay the same whether or not you experience them on the same day, the global evaluation of the two events can vary according to the time interval between the two events. Previous studies on hedonic editing (Linville & Fischer, 1991; Thaler, 1985) proposed that shorter time intervals facilitate mental integration of two events, whereas longer time intervals promote mental segregation, and suggested that people actively arrange the events in time to derive the greatest utility. In one particularly relevant study, Linville and Fischer (1991) tested various combinations of events in different domains and found that there was a

stronger general preference to integrate a gain and a loss when the gain was a positive social event and the loss was in a different domain (e.g., academic or financial). Linville and Fischer (1991) suggested that compared to gains from other domains, *social events make better buffers*.

The benefits of combining positive experiences with negative ones are well documented (e.g., Fredrickson & Levenson, 1998; Fredrickson, Mancuso, Branigan, & Tugade, 2000). When people attempt to cope and self-regulate during stressful events, people consume available psychological resource that become depleted (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Glass, Singer, & Friedman, 1969; Linville & Fischer, 1991) and experience both psychological and physiological consequences (Baumeister, Gailliot, DeWall, & Oaten, 2006; Gailliot et al., 2007). Positive emotions seem to directly undo the impact of negative emotions and replenish the depleted psychological resources. Among the numerous experiences that can generate positive emotions, positive social experiences seem to be one of the most effective devices for replenishing psychological resources and producing this "undoing effect" (Fredrickson & Levenson, 1998; Fredrickson et al., 2000). Close relationships bring about frequent experiences of positive emotions through laughter (Bachorowski & Owren, 2001), richer appreciation of life (Emmons & McCullough, 2003) and positive emotional disclosure (Pennebaker & Francis, 1996), and people are happier when with others than when alone (Pavot, Diener, & Fujita, 1990). Furthermore, even the mere existence of other people can reduce the negative impact of stressful events (Cassel, 1976).

The stress-buffering effect of social relationships, or "social buffering", is well documented in both human and animal studies (for a review, see Hostinar, Sullivan, & Gunnar, 2014). Social resources have a salutary effect on stress coping and the building of psychological resilience (Cassel, 1976; Cohen & Wills, 1985; Rodin & Salovey, 1989) and strong relationships help individuals overcome everyday stress, improve physical health and even increase one's life span (Carter, 1998; Cohen & Herbert, 1996; House, Landis, & Umberson, 1988). Not surprisingly, studies have consistently found that people with higher SWB tend to be extraverted (Lucas & Diener, 2001) and enjoy a better quality of social life (Diener & Seligman, 2002; Hills & Argyle, 2001; Myers, 2000).

SWB AND THE UTILISATION OF SOCIAL BUFFERS DURING HEDONIC EDITING

With regard to hedonic editing, the importance of positive social events for buffering stress provides interesting predictions: (1) people by and large will prefer positive social events as buffers to negative events, as shown in Linville and Fischer's (1991) study, (2) this preference will be greater for those with higher (versus lower) levels of SWB and (3) the use of the social-buffering strategy will lead to better hedonic outcomes, or happiness. The second prediction has been partly tested by Sul et al. (2013). Integrating the previous findings on the general preference for social buffers in hedonic editing and the significance of positive social experiences for one's well-being, Sul and colleagues (2013) examined the relationship between SWB and hedonic editing patterns. They found that happy individuals, compared to less happy individuals, preferred to utilise more positive social events to buffer negative experiences. When asked to report their preferences for the temporal arrangements of pairs of events, happier participants spaced a negative event and a positive event temporally closer together than less happy participants and this preference was even stronger when the positive event was a social gain (e.g., hanging out with a close friend) and the negative event was a financial loss (e.g., receiving a speeding ticket). In addition, when asked to choose a positive event that they wanted to experience after the occurrence of a hypothetical negative event, happy individuals, compared to less happy individuals, chose more social than financial or academic gains. The authors suggested that happy people may be better decision-makers who know how to maximise the hedonic outcomes of their decisions.

However, in order to conclude that happy people make hedonically "wiser" decisions, one must address whether the self-reported preferences shown in Sul et al. (2013) are instantiated in daily life and whether the social-buffering strategy preferred by happy people leads to better hedonic outcomes. The latter question is especially important given that a large body of literature on decision-making shows that preferences (i.e., decision utility) is not always a reliable predictor of an actual outcome (i.e., experienced utility), as discussed below.

DECISION-MAKING AND HAPPINESS

In the existing literature on decision-making, happiness is viewed as a decision outcome and is labelled "utility". It is often assumed that the option chosen by the majority (i.e., general preference) typically produces the maximum levels of utility, or pleasure (Von Neumann & Morgenstern, 1947). However, numerous studies have shown that people often fail to predict the outcome of their decisions accurately (e.g., Hsee & Zhang, 2004; Kahneman, Krueger, Schkade, Schwarz, & Stone, 2006; Morewedge, Gilbert, Keysar, Berkovitz, & Wilson, 2007). Such studies demonstrate that one's preference, which is inferred from one's choice, and actual hedonic experience are distinguishable. In discussions of this distinction, Kahneman and his colleagues (Kahneman, 1999, 2003; Kahneman & Thaler, 2006) refer to the weight given to an outcome during the decision-making process (i.e., preference) as "decision utility" and the actual hedonic quality of experiences as "experienced utility". They propose that experienced utility must be measured to test actual decision outcomes, because decision utility and experienced utility are not always reconciled, and one cannot assume that decision utility reveals the experientially optimal options (Kahneman & Thaler, 2006). Also, Kahneman and colleagues (Kahneman, 1999) suggested further division of experienced utility into "instantaneous utility", which reflects online

evaluations of ongoing experiences, and "remembered utility", which reflects retrospective global evaluations. Self-reported happiness in evaluations of online experiences and global judgements of one's life has been suggested as reliable approximations of instantaneous utility and remembered utility, respectively (Alexandrova, 2005; Frey & Stutzer, 2002; Kahneman, 1999, 2003).

Following this line of thought, it could be reasoned that when decision utility is reconciled to experienced utility, or when an individual makes a choice that results in hedonically optimal outcomes, happiness will be maximised. If so, the social-buffering strategy that is preferred by happy individuals is likely to result in better hedonic experiences. Therefore, to fully understand the relationship between SWB and hedonic editing, not only individuals' preferences but also the actual outcomes of their decisions must be measured. Furthermore, where in the decision process the discrepant preferences between happy and less happy individuals arise should be tested.

PRESENT STUDY

We conducted two studies to investigate the relationships among SWB, utilisation of the social-buffering strategy and hedonic outcomes. In Study 1, we conducted a web-based diary study to examine (1) whether happy individuals experience positive social events more frequently than less happy individuals after negative events in daily life and (2) whether the strategy preferred by happy individuals are associated with better hedonic outcomes. We hypothesised that higher SWB would be associated with more frequent utilisation of the social-buffering strategy based on previous findings (Sul et al., 2013). Also, we expected that happier individuals would be better decision-makers and that their choices would be well reconciled with the actual outcomes. In other words, we predicted that the frequent utilisation of social buffers would be related to higher levels of daily happiness. In Study 2, we employed a retrospective hedonic editing paradigm in which participants evaluated a series of hypothetical

events and then provided a global evaluation of the experience. This task was designed to compare the instantaneous and remembered utilities and to investigate whether the discrepant preferences between happy and less happy individuals arise in the process of transferring online experiences into memory.

Note that "happiness" in the present study has two distinctive meanings. The first refers to SWB, which reflects trait-like happiness that is stable across time and situations (Diener, Smith, & Fujita, 1995; Diener, Suh, Lucas, & Smith, 1999; Sandvik, Diener, & Seidlitz, 1993; Weiss, Bates, & Luciano, 2008). SWB is determined by self-reported global evaluations of one's life (i.e., life satisfaction) and frequency of one's experience of positive and negative emotions over a long period of time (more than six months). We consider SWB to be an independent variable that predicts individual differences in hedonic editing. The second way in which happiness is conceptualised is as a transient feeling. This meaning reflects day-to-day fluctuations of happiness, which can be measured with a question such as "how happy were you today?" We used this "daily happiness" measure as a dependent variable that is assumed to be affected by different hedonic editing strategies. Although daily happiness is naturally expected to be related to SWB, much evidence indicates that these two concepts are distinguishable (for a review, Kahneman, 1999, 2003).

STUDY 1: HEDONIC EDITING IN THE QUOTIDIAN—A DIARY STUDY

To date, theoretical and empirical advances have been made in elucidating people's general preferences in hedonic editing (Linville & Fischer, 1991; Thaler, 1999; Thaler & Johnson, 1990) and the relationship between SWB and preferred hedonic editing strategies (Sul et al., 2013). However, a comprehensive investigation of the relationships among SWB, the social-buffering strategy and actual hedonic outcomes has yet to be conducted. More specifically, it is uncertain whether happier individuals seek out more positive social events than less happy individuals after the occurrence of negative events in daily life. Moreover, the relationship between the use of the social-buffering strategy and hedonic outcomes has yet to be tested.

In Study 1, we conducted a web-based diary study in which participants were asked to submit daily reports about experiences that had a major impact on their mood during the day. We then analysed the sequence of positive and negative events and examined whether happy people intentionally sought out positive social events more frequently than less happy individuals after experiencing a negative event. We were particularly interested in intentional experiences because the purpose of Study 1 is to examine whether SWB is related to the preference for (or active selection of) the social-buffering strategy and how this decision-making is associated with daily happiness. In addition, we investigated whether the frequency of deliberate engagement in positive social events following negative experiences would predict daily happiness.

Method

Participants

Two hundred and twenty undergraduates enrolled in a psychology course at Seoul National University in South Korea, filled out SWB measures at the beginning of the semester. SWB scores were calculated using the composite score of the Satisfaction with Life Scale (SWLS: Diener, Emmons, Larsen, & Griffin, 1985; Pavot & Diener, 1993) and positive and negative affect scale (Diener et al., 1995): SWB = SWLS + PA – NA (see Sul et al., 2013, for details). Among those whose SWB scores were in the top 20% (N = 44) and bottom 20% (N = 45), 33 and 32 students, respectively, volunteered to participate in Study 1, resulting in a sample of 65 participants.

For two weeks, participants reported major events of the day in a web-based diary. Eight individuals who missed more than seven days of participation were excluded. Consequently, 57 participants (12 males and 15 females in the high SWB group, M = 3.36; 15 males and 15 females in the low SWB group, M = -3.47) were included in the analyses. We did not find any gender differences in the following analyses.

Web-based diary

After consenting to participate, participants registered on a website for the diary study. They visited the website daily and completed a survey about their daily experiences. The survey consisted of five pages. On the first page, participants were asked to list five events that had a significant impact on their mood that day, in the sequence in which they occurred. Specifically, participants read the following instructions.

Your task is to look back on your experiences today and list five major events that influenced your mood. Please try to recall the events that made you happy or unhappy. You should write down the events in the order in which they occurred. Please make sure that one sentence contains one event only and please try to make it as specific as possible.

Participants could proceed to the next page only if they filled out the five blanks. On the next three pages, they were presented with the five events that they had listed on the first page and were asked to evaluate the desirability of each event from 0 (not at all desirable) to 10 (most desirable), to categorise the events into three domains (i.e., social, financial, academic) and to indicate the intentionality (i.e., active or passive experience) of each event by choosing either "I experienced the event because I intentionally sought it out" or "I experienced the event because of external causes or by chance". On the last page, we measured each participant's daily happiness level with a single-item question "How happy were you today?" administered on a Likert scale ranging from 1 (very unhappy) to 7 (very happy).

Over the course of the two weeks, participants completed the survey a total of 14 times. On the last day, participants filled out SWB scales (i.e., SWLS and affect scales), were thanked, and were fully debriefed.

Results and discussion

We analysed whether happy people were more likely than less happy people to apply the socialbuffering strategy to their everyday lives, and then tested whether the use of the strategy was indeed related to daily happiness.

Loss-buffering index

In order to quantify the utilisation of the lossbuffering strategy (i.e., using a positive event to buffer a negative event), we adopted a widely used positive-to-negative event ratio measure that has been shown to be a reliable predictor of happiness and life outcomes (Diener, 1984; Diener, Sandvik, & Pavot, 1991; Gottman & Levenson, 1992). Since the focus of the current study was on lossbuffering positive events rather than positive events in general, we only included positive events that the participant had experienced *intentionally* after the occurrence of the negative event (i.e., loss-buffering positive events) in the positive-to-negative event ratio and named this ratio the loss-buffering index (LBI). More specifically, the LBI was calculated by dividing the number of loss-buffering positive events (desirability rating ≥ 6) by the frequency of negative events preceding the positive events (desirability rating \leq 4). The LBI index was created for each domain (LBI_{social}, LBI_{academic}, LBI_{financial}), for each day, for each participant.

For instance, suppose that a participant listed five events for the day in the following sequence: (1) chatted with friends (positive, social, intended), (2) computer crashed before saving a nearly completed term paper (negative, academic), (3) had a date with my romantic partner (positive, social, intended), (4) received a \$100 gift card from grandparents (positive, financial, not intended) and (5) received positive feedback on a presentation (positive, academic, intended). For this sequence, the LBI_{social} for the day would be 1 (1/1), the LBI_{academic} would also be 1 (1/1) and the LBI_{financial} would be 0 (0/1). The first positive event would not be counted because it occurred before the first negative event.¹ Days in which the participant missed the survey or did not report any negative events were excluded from the analyses. The number of days included did not differ across the high SWB ($M_{day} = 9.59$, SD = 2.10) and low SWB ($M_{day} = 10.23$, SD = 2.00) groups, t(55) < 1.20, ns.

SWB-based differences in the mean LBI

We predicted that the participants in the high SWB group would show higher LBI for the social domain than those in the low SWB group, while there would be no difference in the other domains. To test our hypothesis, we ran a 3 (domain: social, academic, financial) × 2 (SWB: low vs. high) mixed analysis of variance (ANOVA). Consistent with our expectations, a two-way interaction was marginally significant, F(2, 110) = 2.91, p = .059, $\eta_p^2 = .05$, such that the mean LBI of the two SWB groups differed only for the social domain. Simple effect analyses revealed that the mean LBI_{social} was larger in the high SWB group (M = .46) than in the low SWB group (M = .31), F(1, 110) = 9.12,p < .01, whereas no difference was found for either the $LBI_{academic}$ (low SWB group: M = .13; high SWB group: M = .12) or LBI_{financial} (low SWB group: M = .02; high SWB group: M = .03), Fs <1, ns. In addition, the main effect of domain was

¹Note that we were not able to link specific negative events to specific positive events because it is very hard to tell which of the negative events are buffered by the subsequent positive events. For example, imagine that one day you got a speeding ticket in the morning, received a harsh negative review at work in the afternoon and hung out with close friends at your favourite bar in the evening. In this case, it is difficult to know whether hanging out with friends buffers the impact of the speeding ticket or that of the work review. This made it difficult for us to create LBIs for each loss domain, hence precluding the examination of the effect of social buffers in same-domain vs. cross-domain conditions. Therefore, unlike Sul et al. (2013), Study 1 does not test whether happy individuals seek out more positive social events than less happy individuals after a negative event in a specific domain (e.g., financial event). In addition, we were not able distinguish between events that were intentional but scheduled ahead of time and events that were scheduled after the negative events because we did not measure the exact time when participants scheduled each event. Despite this limitation, the LBI still reflects—probably not purely but partly—the participants' intention to buffer negative experiences, especially when it is contrasted with the positive-to-negative ratio with unintentional events.

significant, F(2, 110) = 57.32, p < .001, $\eta_p^2 = .51$, indicating that participants in general experienced positive social events most frequently after negative events: The mean LBI was .38 for the social domain, .12 for the academic domain and .03 for the financial domain. The mean LBI across the domains was generally greater in the high SWB group (M = .31) than in the low SWB group (M = .23), F(1, 55) = 2.68, p = .11, $\eta_p^2 = .05$.

In short, the results suggest that after the occurrence of negative events, happier individuals are more likely than less happy individuals to actively seek out and experience positive social events.

In order to rule out the possibility that the higher LBI for the social domain simply reflects the general tendency for happier individuals to experience positive social events more frequently than less happy individuals (e.g., Diener & Seligman, 2002), we obtained a positive-to-negative ratio with positive events experienced before the occurrence of the first negative event within the day. If the LBIs of happier individuals were higher because they sought out positive social experiences regardless of whether or not a negative event occurred, the effect of SWB on this ratio would be also significant. However, a 3 (domain: social, academic, financial) × 2 (SWB: low vs. high) mixed ANOVA showed no significant main or interaction effects related to SWB, Fs < 1, ns. Only the main effect of domain was significant, $F(2, 110) = 25.11, p < .001, \eta_p^2 = .31$, in the same direction as that found with the LBI (social: M =.21; academic: M = .12; financial: M = .02). That is, the difference in the LBI_{social} between happy and less happy individuals does not seem to have resulted from general differences in the frequency of positive social experiences. Furthermore, to confirm that the effect of SWB is significant only for *intended* positive events (i.e., social buffering), we calculated another positive-to-negative ratio-this time with the number of unintentional positive events experienced after the occurrence of the first negative event. A 3 × 2 mixed ANOVA revealed only a significant main effect of domain (social: M = .12; academic: M = .04; financial: M = .01), F(2, 110) = 26.68,

p < .001, $\eta_p^2 = .33$. Importantly, no effect of SWB was found, Fs < 1, ns.

Given the evidence that preference for positive social situations is associated with extraversion (Lucas & Diener, 2001), we measured the Big 5 traits using the Ten-Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003) to examine the possibility of (a) personality trait(s) affecting the relationship between the SWB and the utilisation of social buffers. One-way ANCOVA with the scores of Big 5 traits as covariates revealed that the effect of SWB remained marginally significant, F(1, 49) = 3.21, p = .08, $\eta_p^2 = .06$. None of the effects of the personality traits was significant, Fs < 1.74, ns.

Taken together, these findings suggest that the happy and less happy differ only in the frequency of *intentionally* experienced positive *social* events *after* the occurrence of a negative event. In daily life, happier individuals seem to be more likely to use the loss-buffering strategy with social events than are those who are less happy.

Effect of loss buffering on daily happiness

Thus far, we have examined differences between happy and less happy individuals in the utilisation of social buffers. The next question is whether and how the loss-buffering strategy influences hedonic outcomes. Do day-to-day fluctuations in the LBI affect day-to-day variations in daily happiness levels? In other words, do daily happiness levels increase with more frequent utilisations of positive social events as buffers?

To answer this question, we examined withinperson correlations between the LBI and daily happiness (Conway & Briner, 2002; Emmons, 1991; Michela, 1990). Specifically, we computed the partial correlation coefficients between the self-reported levels of daily happiness and LBIs across the two weeks of participation while controlling for the effects of the two aforementioned positive-to-negative ratios (the ratio computed with social positive events experienced before the occurrence of the first negative event and the ratio computed with unintended positive events), separately for each domain. As a result, three correlation coefficient *r*s between daily happiness and LBI_{social}, LBI_{academic} and LBI_{financial} were obtained for each participant. Next, we converted the coefficients into Z scores using Fisher's r-to-Z transformation. The average Z scores were then transformed back to r scores.

As expected, the mean correlation between daily happiness and LBI_{social} was significant, r =.26, p < .05, Cohen's d = 1.61, suggesting that the use of positive social events to buffer the impact of negative events was positively associated with one's daily happiness. None of the correlations between daily happiness and LBI_{academic}, LBI_{financial} or other positive-to-negative ratios was significant. That is, the frequencies with which individuals utilised positive social events as a loss buffer were associated with day-to-day fluctuations in happiness. This was true even when the effects of other positive social events were controlled for. Positive social events that are intentionally experienced seem to contribute to one's hedonic experience (i.e., daily happiness) by mitigating the impact of prior negative events.

Intriguingly, the strength of this association did not differ between the high and low SWB groups, t(52) < 1, ns, suggesting that using positive social events as a buffer against negative events indeed is a hedonically relevant and effective strategy for everyone. This finding led us to the following question: what makes happy individuals more likely than less happy individuals to utilise positive social events as buffers despite there being similar benefits for both happy and less happy individuals? A possible answer to this question is that the discrepancy exists in how the online experiences (i.e., instantaneous utility) are construed in memory (i.e., remembered utility). Study 2 was designed to test this possibility.

STUDY 2: RETROSPECTIVE HEDONIC EDITING

In Study 2, we used a retrospective hedonic editing paradigm to test the hypothesis that happy individuals would construe the experience of loss buffering with a positive social event more positively than less happy individuals. Participants imagined experiencing a series of seven hypothetical events presented on the computer-one for each day of the week. Each trial consisted of one negative financial or social event, one positive financial or social event and five neutral events. The intervals between the negative event and positive event were manipulated to be short (1 day) or long (4 days) by varying the number of neutral events between the two target events. The short interval condition in which the financial loss was closely accompanied by a social gain was designed to represent the use of the loss-buffering strategy, in accordance with the hedonic editing pattern that was preferred by happy individuals in Sul et al. (2013). Afterwards, participants evaluated their overall level of happiness for the week (Figure 1). This type of retrospective evaluation paradigm with hypothetical experiences on the computer has also been used in previous studies (e.g., Cowley, 2008; Morewedge et al., 2007). For example, Cowley (2008) used a gambling task where temporal proximity between a big win and a big loss was manipulated with minor wins and losses. Cowley (2008) tested gambling behaviour in relation to hedonic editing and found that potentially irresponsible gamblers were more likely than normal gamblers to follow hedonic editing rules in retrospective editing processes (i.e., global evaluations) and reconstruct their memories of gambling experiences in a more favourable manner.

The retrospective hedonic editing task used in Study 2 was designed based on the following reasoning. It is known that certain moments are selected and stored in memory more than other moments and subsequently referenced in retrospective global evaluations. For instance, Kahneman, Fredrickson, Schreiber, and Redelmeier (1993) showed that positive and negative peaks and the final moment are the most memorable in a series of experiences and consequently determine the retrospective evaluations of the experiences as a whole (i.e., peak-end rule). The selection of moments and reconstruction of the experience are known to be affected by personal beliefs, motivation or cognitive styles (Cowley, 2008;





Figure 1. Design of Study 2. (A) An example of a single episode consisted of seven daily events. Participants provided instantaneous eventby-event evaluations (daily evaluations) and then a global evaluation of the whole episode (weekely evaluation) KRW: Korean Won (B) Schematic illustration of the hedonic bias index that captures the discrepancy (cognitive bias) between the instantaneous daily evaluations (experienced utility) and the global weekly evaluation (remembered utility).

Kunda, 1990). Thus, we expected participants in the retrospective hedonic editing task to remember the salient target events (i.e., positive and negative events, rather than neutral events) and to reconstruct them in memory in accordance with how they construed the events; this in turn would be reflected in the retrospective global evaluations of the past events. We hypothesised that the different hedonic editing patterns between happy and less happy individuals would stem from differential constructions of online experiences (i.e., instantaneous utility) in memory (i.e., remembered utility). Thus, we predicted that SWB would be associated with the extent of discrepancy between the retrospective global evaluations of episodes and the event-by-event instantaneous evaluations,

which we will here after refer to as "hedonic bias". We expected that happy individuals would show a positive bias towards the series of episodes in the short interval condition with a positive social event because happy individuals would expect positive social experiences to buffer the impact of the recent negative event.

Method

Participants

One hundred and ninety five students taking an Introduction to Psychology class at Seoul National University in South Korea completed the SWB measure at the beginning of the semester. Among those who scored in the top 33.3% (N = 65),

30 individuals (18 males and 12 females) participated in this study and comprised the high SWB group (M = 2.23). Among those who scored in the bottom 33.3% (N = 65), 32 students (11 males and 21 females) participated and were included in the low SWB group (M = -2.30). As the male and female participants were unevenly distributed between the two SWB groups, we performed additional analyses controlling for gender. Most of the results stayed the same, unless otherwise specified.

Desirability rating

A separate group of 104 participants evaluated the desirability of 120 events on a scale of 0–10. We chose 32 target events with desirability ratings that did not vary with SWB for the main task (see Supplementary Materials). The target events consisted of four large financial gains, four large social gains, four small financial gains, four small social gains, four large financial losses, four large social losses, four small financial losses and four small social losses.

Evaluation task

Participants were seated at a computer and performed an evaluation task. The evaluation task was made up of 16 weekly evaluation blocks and each block consisted of seven daily evaluation trials. Each block was designed to be experienced throughout a hypothetical seven-day period. A list of seven events comprising two target events (one negative and one positive) and five filler events (neutral) were presented one by one. We varied the payoffs (mixed-loss: loss larger than gain, mixed-gain: gain larger than loss), event domains (financial loss + social gain, social loss + financial gain) and time intervals (1-day, 4-day) between the two target events. Only cross-domain combinations of events were used based on the finding of Sul and colleagues (2013) that differences between happy and less happy individuals emerged only in the cross-domain condition. The payoffs and time intervals were also determined based on the results from this study (Figure 1).

We set up the computer program to always introduce a negative event before a positive event. The appearance of the first target event was randomly selected from the first, third or fifth day for the one-day condition and from the first, second or third day for the four-day condition. Intervals between the loss and gain were manipulated by the number of neutral filler events between the two target events. In the one-day condition, we inserted a positive event the day after the negative event, whereas three neutral events were placed between the two target events in the four-day condition. In order to avoid any order or uncontrolled effects arising from the intrinsic properties of events, we randomised the order of block conditions and varied the corresponding target and neutral events for each person.

Within each block, there were seven daily evaluation trials. Participants were told to imagine that one event occurred each day of the week, and that each event was the representative event of the day. Their task was to evaluate how good or bad they would feel after experiencing each event on a scale from 1 (very negative) to 9 (very positive). After the evaluations of the seven separate events (instantaneous evaluations), a message marking the end of the week appeared on the screen. The participants were then asked to imagine that they had finished experiencing the seven events during a week, and to evaluate their global happiness level for the week on a scale of 1 (very unhappy) to 7 (very happy) (global evaluation). All responses were given by pressing the corresponding number on the keyboard.

Results and discussion

SWB-based differences in mixed-gain episodes

To capture the extent of discrepancy between the global evaluations and the instantaneous evaluations, we calculated a hedonic bias index by subtracting the z scores of mean daily ratings of seven events from the z scores of the weekly ratings of each series of events, for each individual (Figure 1). We predicted that participants in the high SWB group would evaluate the week in

which a positive social event occurred shortly after a negative event more favourably than those in the low SWB group. However, no such difference was expected for weeks with long intervals between a negative event and a positive social event. Therefore, we expected a significant interaction effect of interval and SWB on the hedonic bias index for cases in which a financial loss was followed by a social gain.

A 2 (interval: 1-day vs. 4-day) \times 2 (SWB: low vs. high) mixed ANOVA was conducted separately for the financial loss + social gain pairs and the social loss + financial gain pairs in each payoff condition. As shown in Figure 2, the findings from the mixed-gain condition were consistent with our predictions. The two-way interaction effect of interval and SWB on the hedonic bias index was significant for the financial loss and social gain pairs, F(1, 60) = 4.12, p < .05, $\eta_p^2 = .07$. As we expected, the high SWB group showed greater discrepancy between the global and instantaneous evaluations for the one-day interval (M=.25) than did the low SWB group (M=.16), $F(1, 60) = 5.43, p < .05, \eta_p^2 = .08$. Additionally, no difference was found between the high SWB group (M= .18) and low SWB group (M= .20) for the four-day interval, F(1, 60) < 1, ns. Neither the main effect of SWB nor the main effect of interval was significant, F(1, 60) < 1, ns. Although the inclusion of gender as a control

variable yielded a less robust interaction effect of interval and SWB on the hedonic bias index, $F(1, 59) = 2.32, p = .13, \eta_p^2 = .04$, the difference between the high and low SWB groups in the hedonic bias for the one-day interval remained marginally significant, F(1, 59) = 3.89, p = .05, η_p^2 = .06, without a significant gender effect, $\dot{F}(1, 59) = 1.23$, ns.

With regard to the social loss and financial gain pairs, we expected the mean ratings of the high SWB group to be comparable to that of the low SWB group for both interval conditions. However, we found an unexpected significant two-way interaction effect of interval and SWB on the hedonic bias, F(1, 60) = 6.09, p < .05, $\eta_p^2 = .09$, such that the direction of the effect was opposite to that of the financial loss and social gain pair. The low SWB group's hedonic bias for the oneday interval (M = .23) tended to be greater than that of the high SWB group (M= .16), F(1, 60) =2.31, p = .13, while the low SWB group's hedonic bias for the four-day interval (M = .20) was significantly lower than that of the high SWB group (*M*= .27), *F*(1, 60) = 4.23, p < .05, $\eta_p^2 = .09$.

One possible explanation of the results is that the low SWB group might have expected a lossbuffering effect of financial gains. Although it was not as robust as the bias for social buffers by the high SWB group, the low SWB group showed relatively greater hedonic bias for financial buffers

Financial Loss + Social Gain 0.3 0.35 0.3 0.25 0.25 0.2 0.2 0.15 0.15 0.1 0.1 0.05 0.05 0 0 low SWB high SWB high SWB low SWB ■1-day ■4-day 1-day 4-day

Social Loss + Financial Gain

Figure 2. Hedonic bias index (global evaluation-mean instantaneous evaluation) by the low SWB group and high SWB group for crossdomain pairs in the mixed-gain condition in Study 2.

compared to the high SWB group and a similar tendency has been also reported in Sul et al. (2013). This result is consistent with previous findings of negative correlations of SWB and materialism (Burroughs & Rindfleisch, 2002; LaBarbera & Gürhan, 1997; Srivastava, Locke, & Bartol, 2001) and preference for concrete over abstract rewards in low SWB participants (Updegraff & Suh, 2007). Another potential explanation for this unexpected result may be found in the recency effect (Kahneman et al., 1993; Wyer & Srull, 1986). Although we varied the timing of the target events, the positive events in the four-day interval condition took place on average one day later (on the fourth, fifth or sixth day) than positive events in the one-day interval condition (on the second, fourth or sixth day). Thus, the greater salience of the more recent positive event in the four-day interval condition may have led people to favour it over the one-day interval. Furthermore, it may be that if a given positive event is not expected to be an effective buffer (e.g., financial gains for the high SWB group), the loss-buffering tendency (represented by the preference for one-day intervals) becomes outweighed by the recency effect.

SWB-based differences in mixed-loss episodes

Contrary to our expectations, no significant interaction effect was found in the mixed-loss condition, Fs(1, 60) < 1, ns. Neither the main effect of interval nor SWB was significant, Fs(1, 60)< 1.78, ns. The inconsistent results in the mixedloss condition might be a by-product of Study 2's design characteristics. The intervals (one day vs. four days) used in Study 2 were based on the intervals that were preferred by happy (0.68 day) and less happy (3.32 days) individuals for the mixed-gain condition in a previous study (Sul et al., 2013). In this study, for the mixed-loss condition, the mean intervals favoured by happy (2.20 days) and less happy individuals (5.32 days) were longer so the one-day and four-day intervals in Study 2 may not have adequately captured the differences between the low SWB and high SWB groups.²

SWB-based differences in instantaneous evaluations of the events

By using the hedonic bias index, we assumed that the discrepancy between the global evaluation and the event-by-event instantaneous evaluation would be mainly driven by cognitive construal processes and that SWB is likely to influence how information is construed in memory through reconstruction processes (without affecting online event-by event evaluations). To test this assumption, we performed a 3 (events: neutral, loss, gain) × 2 (interval: one-day, four-day) × 2 (SWB: high, low) mixed ANOVA on the instantaneous evaluations for each event combination (financial loss + social gain, social loss + financial gain) and each payoff (mixed-gain, mixed-loss). Neither the interaction effect between SWB and other variables nor the main effect of SWB was significant in any of the conditions, suggesting that happy individuals and less happy individuals made similar evaluations for each event.

² In order to test this possibility, we conducted an additional experiment with another sample of participants (N = 31; 15 with SWB scores in the bottom 33% and 16 in the top 33%, among 47 undergraduates). We used another version of the retrospective hedonic editing paradigm similar to the task described above but in which the intervals between the two target events were set to two or five days, not one or four days. Additionally, each block was extended to span 10 hypothetical days instead of seven to avoid situations in which one of the target events was located at the beginning or end of a block (the four-day interval conditions). Participants were also asked to assume that the given events were happening in other people's lives rather than their own lives. We found a marginally significant 2 (SWB: bottom 33% vs. top 33%) × 2 (interval: 2 vs. 5) interaction effect on retrospective evaluations in the mixed-loss condition (i.e., a large financial loss + a small social gain), F(1, 29) = 3.40, p = .075, $\eta_p^2 = .11$. Further analyses revealed that happy participants evaluated two-day interval blocks more favourably (M = 4.13) than their less happy counterparts (M = 3.81), whereas the opposite was the case for the five-day interval blocks (M = 4.44 and 3.73 for the low SWB and high SWB group, respectively), although the simple effects for these comparisons were not statistically significant, $F_8 < 1.89$, ns. No interaction or main effect of SWB and interval was found in the social loss and financial gain pairs, all $F_8 < 2.46$, ns. This suggests that the null finding in the mixed-loss condition in Study 2 was probably due to the less optimal selection of time intervals (one vs. four days).

In sum, Study 2 showed that happy individuals, compared to less happy individuals, construed the episodes with a social gain as a cross-domain buffer more favourably, whereas less happy individuals tended to construe loss buffering with financial gains more positively. Consistent with our expectation, SWB was associated with differences in how instantaneous evaluations of experiences were reconstructed into global evaluations. This bias in remembered utility may have led individuals with high SWB and low SWB to different preferences for loss-buffering strategies.

GENERAL DISCUSSION

We have demonstrated that happy individuals and less happy individuals use different hedonic editing strategies in daily life and have proposed that this difference may arise from differences in how instantaneous utility is translated into remembered utility in the decision process. Study 1 showed that happy individuals utilised the loss-buffering strategy with a positive social event as a buffer more frequently than less happy individuals in daily life. Intriguingly, social loss-buffering predicted the hedonic experiences of both happy and less happy individuals. Study 2 revealed that this discrepancy emerges during the process of aggregating instantaneous experiences into global evaluations. When asked to evaluate past events retrospectively, happy individuals evaluated an episode with a socialbuffering event more positively than less happy individuals, whereas the event-by-event instantaneous evaluations were the same between the two groups. Taken together, our findings suggest that positive social events experienced after the occurrence of a negative event may have the same immediate salutary effect for everyone but happier individuals hold more favourable views of these effects in their memories.

Examining hedonic editing and hedonic outcomes in daily life

One of the major findings in the present study is that the preference difference between happy and less happy individuals found in Sul et al. (2013) was indeed instantiated in daily life. Sul et al. (2013) first examined the relationship between SWB and hedonic editing and found that happy people, compared to less happy people, showed a stronger preference for the social-buffering strategy. In the discussion of this finding, they proposed that happy people are likely to have better knowledge ("hedonic wisdom") about what enhances their happiness in daily life and how to apply this knowledge to choose the hedonically optimal option. Assuming that happy individuals are hedonically "wiser" and considering the expansive literature on the role of social buffers in stress-coping and resilience (Carter, 1998; Cassel, 1976; Cohen & Wills, 1985; Fredrickson 1998; Hostinar et al., 2014; Rodin & Salovey 1989), it is highly likely that the use of social buffers is a hedonically optimal strategy. However, whether there are SWB-based differences in the use of this strategy in real situations and whether loss buffering with positive social events actually predicts daily happiness was not directly tested until the present study.

We addressed existing gaps in the literature by examining whether happy and less happy individuals adopt different decision strategies in daily life and examining the actual outcomes of the social-buffering strategy (Study 1). As expected, happy individuals were more likely than less happy individuals to intentionally seek out positive social events after the occurrence of negative events. Importantly, the frequency of utilising this strategy positively predicted hedonic outcomes for both happy and less happy individuals. Combining these findings, it seems that happy individuals, compared to less happy individuals, are better at enhancing the hedonic outcomes of their decision. Happy people seem to be better decision-makers, at least in terms of hedonic editing.

The discrepancy between preferences and outcomes

Another important finding is that the hedonic outcome of the social-buffering strategy seems to be equally beneficial regardless of individuals' level of SWB. As reviewed in the Introduction, a large body of evidence suggests that preference, or decision utility, and actual outcomes, or experience utility, should be considered separately in the decision process (Kahneman, 1999, 2003; Kahneman & Thaler, 2006) and that reconciling the preference and the outcome is important for the maximisation of happiness (e.g., Hsee & Zhang, 2004; Kahneman et al., 2006; Morewedge et al., 2007). Consistent with this view, we found that happy individuals used social buffers more frequently than less happy individuals, although the effect of this strategy was the same regardless of the individuals' happiness levels. This implies that happy individuals' decision utility might be better reconciled to their experienced utility (Study 1). Study 2 further revealed that this discrepancy arises when instantaneous utility (online evaluation) is translated into remembered utility (global evaluation). SWB seems to be associated with the preference for a certain hedonic editing strategy (i.e., social buffering) by modulating the process of aggregating instantaneous experiences of social buffering into a global evaluation.

Yet, caution is needed when we interpret these results. We did not directly examine the process in which remembered utility is converted to decision utility. It is also possible that remembered utility is amplified or reduced when it is converted to decision utility because happy people overvalue and/or less happy people devalue the effects of social buffering during hedonic editing. Motivational factors (e.g., Higgins, 1987) or the amount and quality of social resources (e.g., Diener & Seligman, 2002; Hills & Argyle, 2001; Myers, 2000) may also influence this process.

Limitation and future research

Before concluding, there are some limitations in the present study. First, it should be noted that our findings are correlational. In particular, the direction of the causal relationship between LBI and daily happiness in Study 1 is not clear. Although we assumed that LBI affected daily happiness because the life events occurred before

the evaluations of daily happiness, there still exists the possibility of memory biases. Individuals in happy moods might have rearranged their experiences to be more in accordance with hedonic editing rules. In addition, although SWB is often considered a trait-like factor that is stable across time and situation within an individual (Diener et al., 1995, 1999; Sandvik et al., 1993; Weiss et al., 2008), caution is needed when interpreting causal directions. Future studies using experimental manipulations or interventions can shed light on the causal relationship. Second, we do not conclude that what we tested in Study 2 is the only mechanism that can underlie the different hedonic editing patterns among happy and less happy individuals. Factors that can interact with the hedonic bias in the decision process, such as motivation, personality or other emotional and social factors, should be systematically tested in the future. Lastly, there are studies showing that the ways of using social resources vary across cultures despite the universal significance of social buffering (Kim, Sherman, Ko, & Taylor, 2006; Taylor, Welch, Kim, & Sherman, 2007). Cultural influences on the relationship between happiness and the types of social events preferred in the loss-buffering strategy (e.g., implicit vs. explicit social support, as suggested by Taylor et al., 2007) could be an interesting topic for future research.

Conclusion

Hedonic editing, as it can be inferred from its name, has been implicated in the quality of hedonic experiences, or happiness. In particular, the social-buffering strategy has been suggested to be most relevant to SWB. Notwithstanding its importance, little is known about how people implement and experience hedonic editing in daily life, nor what the hedonic consequences are. The present study replicated and extended the existing literature by testing the relationships among SWB, hedonic editing and hedonic outcomes. Our findings suggest that happy people employ the social-buffering strategy in daily life and intentionally seek out positive social events to a greater degree than their less happy counterparts. Importantly, this strategy seems to make an actual contribution to hedonic outcomes in everyday life, equally among happy and less happy people. We also found evidence suggesting that the discrepant preferences between happy and less happy people arise from differential reconstructions of the hedonic outcomes of social buffering in memory. This implies that SWB may be associated with how one construes and remembers the outcomes of hedonically relevant choices, which in turn shapes the different preferences in hedonic editing (Sul et al., 2013). In conclusion, as far as hedonic editing is concerned, it seems that happy people, compared to less happy people, are better decisionmakers who use more experientially optimal hedonic editing strategies (i.e., social buffering) that lead to better hedonic outcomes in daily life. We expect future research to extend our findings and to provide a more complete picture of the relationship between happiness and decisionmaking.

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Supplementary material

Supplementary Table 1 is available via the 'Supplementary' tab on the article's online page (http://dx.doi.org/10.1080/02699931.2015.1048669).

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