THE RELATION OF NORMS AND MEMORY FOR EMOTION

by

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The Relation of Norms and Memory for Emotion

Human suffering is the focus of much scientific attention. In recent years, however, there has been an increased interest in the positive aspects of life experiences and their psychological implications. The field of subjective well-being (SWB) comprises the scientific analysis of how individuals evaluate their lives (Myers, 2000). These evaluations include people's emotional reactions to events, their moods, and judgments they form about their life satisfaction, fulfillment, and satisfaction with life's domains such as social relationships and work (Diener, Scollon, Oishi, Dzokoto, & Suh, 2000). Thus, SWB concerns the study of what lay people might call happiness.

Subjective Well-Being: Measurement and Discrepancies

Measuring SWB

A central concern among SWB researchers is how best to measure SWB. There are three major approaches to measuring SWB, each of which conceptualizes SWB distinctively and relies on different kinds of measures. One approach views SWB as a global assessment of life and its facets, such as marriage or work. The global approach involves large surveys asking individuals about their overall happiness and their satisfaction with large domains, such as family life. In the second approach SWB is viewed as the recollection of past emotional experiences. The retrospective approach involves having individuals recall whether they experienced relevant emotions during a specific time period, such as the past week or month. The retrospective approach focuses on memories of past emotions rather than global judgments about life and its domains. The third approach views SWB as an aggregation of multiple emotional reactions across time (Kahneman, 1999). The aggregation

approach emphasizes on-line or momentary emotions and often relies on the experience sampling method for data collection (Scollon, Kim-Prieto, Diener, 2003).

In experience sampling, participants provide a series of self-reports about their momentary thoughts and emotions over an extended period of time. Typically, participants record their emotions on palm pilot computers at several random moments each day when signaled for a set number of days. The benefits of experience sampling are that it captures a more representative sample of a person's emotional life and it is not vulnerable to memory bias. Moreover, momentary emotions for the experience sampling period can be summed for an overall assessment of the participant's emotional state during that time period, thereby increasing reliability well beyond that of a single-occasion report.

Discrepancies in SWB Measures

Much research exists on the convergent validity of SWB assessments. In fact, the different measures of SWB do converge and are moderately related to one another (Wirtz, Kruger, Scollon, and Diener, 2003). However, the correlations are not perfect and there are inconsistencies among the measures. Discrepancies between momentary reports and retrospective reports of emotional experience are well-replicated findings in the emotion literature (Mitchell, Thompson, Peterson, & Cronk, 1997; Robinson, Johnson, & Shields, 1998; Scollon et al., 2004; Feldman Barrett, 1997; Wirtz, et al., 2003). For example, Mitchell and colleagues (1997) found that people's emotional recollection of an event, such as a three week bicycling trip, was more positive than their on-line emotional experience during the event itself. The "rosy view" phenomenon was associated with an increase in the number of negative thoughts during the event that seem to be caused by distractions, disappointment, and a less positive view of the self. The effects diminished within days of

the event, and people's evaluations of the event became much more positive. Diener and Thomas (1990) found that subjects overestimated the intensity of their on-line positive and negative emotions when recalling the intensity of their emotions from the same time period. Their findings suggest that people imagined themselves and life as being more intensely emotional than their on-line reports of emotional experience indicated. Diener and Thomas (1990) further found that memory biases occurred during the retrieval process rather than during encoding. In short, people often remember their emotions differently from the way they experienced their emotions.

Emotional Self-Reports: Two processes of retrieval

Recently, Robinson and Clore (2002) suggested that individuals rely on different sources of information when answering retrospective versus momentary reports of emotional experience. When remembering a short, discrete time-frame (on-line reports) individuals recall specific instances or use a retrieve-and-aggregate strategy to inform their judgments. Thus, they draw on episodic knowledge about their emotional experiences. When remembering longer, more abstract time-frames (retrospective reports) specific memories may not be accessible or may be too difficult to recall. Instead individuals use heuristics, such as the self-concept or implicit beliefs, to inform their memory for emotions. In other words, people draw on semantic knowledge about their emotional experiences when answering retrospective reports (Robinson & Clore, 2002).

To test their model, Robinson and Clore (2002) postulated that reliance on heuristic information for recall should take less effort than recalling and aggregating specific instances from a time-frame. Indeed, participants were just as quick to recall their emotions from the distant past as they were to recall their emotions from the past hour, suggesting that heuristic

information was being used when recalling longer, but not shorter, time-frames. Robinson and Clore's (2002) findings are important to the present research because they suggest that bias in memory for emotion can systematically be accounted for by heuristic information on which people rely (Scollon, et al., 2004).

The Time-Sequential Model of SWB

In an effort to integrate a wide-range of SWB measures from on-line moods to global life satisfaction, Kim-Prieto et al. (in press) proposed a Time-Sequential Model of Subjective Well-Being. According to the model (shown in Figure 1), events elicit emotional reactions, and reactions are gradually modified and integrated into the complex network that includes the various measures of SWB. Importantly, the model recognizes the distinction between momentary feelings and people's recall of emotions, noting that as SWB unfolds, sources such as norms, implicit theories, and other heuristic information can influence SWB at any stage.

Norms and Memory for Emotion

Emotion norms and retrospective reports of emotion

According to both Robinson and Clore's theory (2002) and the Time-Sequential Model of SWB (Kim-Prieto, et al., in press), heuristics, such as norms, intervene between an emotional reaction and the later recall of the emotion. Thus, we might expect norms to have a stronger relation to recalled emotion than to momentary feelings. In other words, people might remember emotional experiences in ways that are consistent with norms even if their on-line emotions are less consistent with norms.

Norms and emotion reports. A number of studies provide indirect support for the idea that norms would be related to memory for emotional experiences. It is important to

note, however, that the studies that have measured norms directly have focused only on global or retrospective measures of emotion. Nevertheless, these studies do provide support for the idea that norms are related to emotion reports. One study conducted by Diener, Scollon, Oishi, Dzokoto, and Suh (2000) found that positivity, the tendency to evaluate facets of life in general as good, was associated with cultural norms regarding the ideal level of life satisfaction. For example, countries and people who value positive emotions, such as Colombia and the United States, were more likely to display positivity than countries and people who did not have an emphasis on positive emotions, such as China. Further, Okazaki and Kallivayalil (2002) found that Asian Americans who viewed depression and anxiety as more normative reported more depressive and anxious symptoms, even after controlling for actual functioning.

With regard to specific emotions, norms for pride and guilt appear to elicit the largest cultural differences. Eid and Diener (2001), for example, found that in collectivistic cultures, such as China, guilt was seen as less undesirable to experience than in individualistic countries. However, in individualistic cultures, such as Australia, pride was considered more desirable to experience than in collectivist cultures. Norms for emotions, in turn, were related to emotional experiences within nations, such that people in cultures that valued pride reported experiencing more pride and people in cultures that valued guilt reported experiencing more guilt. Similarly, Kim-Prieto, Diener, and Fujita (2004) found that pride clustered with "negative" emotions in countries such as India, whereas among Western societies, pride clustered with the positive emotions. Emotionally, individualistic and collectivistic cultures differ in terms of self-focused or other-focused emotions. People in individualistic cultures seek out, experience, and remember more self-focused emotions,

while people in collectivistic cultures seek out, experience, and remember more other-focused emotions and are more concerned with normative behavior (Markus & Kitayama, 1991; Triandis, 1997). Researchers have noted that guilt enhances the individual's relation to others, whereas pride distances the individual from social others (e.g. "I am special"). Thus, for collectivist societies, guilt serves a more important function and is considered more appropriate, whereas in individualist cultures, pride is more desirable and appropriate (Kitayama, Markus, & Kurokawa, 2000).

Another study found similar results in sub-Saharan Africa (Kim-Prieto & Eid, 2004). Collectivistic African nations found guilt more desirable and pride less desirable than the individualist African nations. Again, norms for emotions were related to global reports of emotion within nations.

On-line versus retrospective reports. Other studies that have examined the difference between on-line and recalled measures did not measure norms directly. For example, Oishi (2001) found that Asian Americans and European Americans differed in their retrospective ratings of emotion but not in their on-line reports of emotion. When asked to recall their on-line moods, European Americans remembered their week as very good and Asian Americans remembered their week as mildly good, although the two groups reported their mood as being equally good on their on-line reports. Similarly, Wirtz, Chiu, Diener, and Oishi (2005) found that European Americans and Asian Americans on spring break vacations reported similar levels of on-line positive affect, but at the time of recall the European Americans recalled a higher intensity positive affect. Presumably, cultural norms were related to the recall of emotion and were not related to the experience of emotion, but norms were not directly tested.

The Present Studies

Although considerable evidence supports the notion that cultural norms are related to reports of emotion, one major limitation of the previous research is that emotions have been measured using only global or retrospective reports. Because previous research has not investigated whether norms are related to momentary experience, it remains possible that norms are related to memory for emotions because of their operation on momentary experience. Thus, a major goal of the present research was to clarify the relation between norms and emotions. At first glance, the distinction between on-line and recalled emotions may seem rather trivial. However, substantial research has demonstrated discrepancies between on-line emotion and memory for emotions. In particular, several factors can intervene between an emotional experience and the recall of that experience, leading to systematic biases in people's memories.

Implications

It is important to understand the mechanisms involving the construction and reconstruction of retrospective emotional ratings for several reasons. First, clinicians use retrospective emotional evaluations when assessing their patients' well-being and progress, which may be susceptible to the influence of outside factors, such as norms. The precision of such instruments can be improved to the extent that we understand the sources, other than experiences, that are influencing retrospective instruments. Second and more importantly, most researchers in general use retrospective reports of emotion not on-line measures, so understanding whether norms operate on the experience of emotion or the memory of emotion would provide valuable information that could improve future studies. Third,

investigating which component of SWB is affected by norms also provides an opportunity for an empirical test of the Time-Sequential Model of SWB (Kim-Prieto, et al., in press).

On a more practical level, our lives are comprised of memories, especially meaningful and therefore usually emotional memories. Regardless of their degree of accuracy, such memories are undoubtedly important. For one, people base their decisions on their memory for emotions, not on their on-line experiences. Thus, if a person misremembers an event as generating more happiness than it really did, then he or she will be more inclined to engage in that activity in the future. Wirtz, Kruger, Scollon, and Diener (2003) compared students' on-line and retrospective experiences during a spring break vacation. When asked how much they would want to take a similar vacation in the future, only the remembered experiences predicted future choice. On-line enjoyment bore no relation to whether students wanted to repeat the experience. The results suggest that although on-line measures may provide a more veridical account of emotional experience (Kahneman, 1999), retrospective measures are better for predicting future behavior. To better understand and predict behavior, it is important for researchers to understand the level at which other factors are influencing reports of emotion.

Overview and Predictions

Norms are related to self-report of emotion, but the relation has only been demonstrated using retrospective and not on-line measures of affect (Diener, et al., 2000; Eid & Diener, 2001; Okazaki & Kallivayalli, 2002). Previous research has shown that the emotions that individuals experience from moment to moment frequently differ from retrospective reports of emotion from the same time period (Diener & Thomas, 1990). One cause of the inconsistency between on-line and retrospective reports of emotion is that

memories of emotion are not encoded directly into memory, but instead emotional memories are continually being reconstructed (Robinson & Clore, 2002). As the on-line emotions fades, the memory for the emotional experience can be influenced by several factors including norms (Kim-Prieto, et al., in press). In addition, research has found cultural differences in recalled reports of emotion, but no differences have been found in on-line reports of emotion (Oishi, 2001). Presumably, the differences are due to norms operating on memory for emotion and not experience of emotion, but the relation has not been directly tested. Thus, it remains unclear exactly how norms are related to emotion reports. Are norms influencing the moment to moment experience of emotion? Or are norms influencing later recall and memory for emotion?

If norms, in fact, are related to momentary experience, we would expect on-line reports of emotion to be highly correlated with reported norms. On the other hand, if norms are related to memory for emotions, we would expect the on-line reports of emotion to correlate only weakly with reported norms and the recalled reports to correlate more strongly with norms. Further, as the time-frame of recall increases and the on-line emotional experience fades, people should become more reliant on norms in their memory. Reliance on norms should be reflected in increasing correlations between recalled reports of emotion and norms as the time-frame of recall increases. Finally, we predicted that the effect of norms on recall would be greater for pleasant than unpleasant emotion because pleasant emotions are more open to cultural interpretation where unpleasant emotions are strongly tied to neurobiological processes (Eid & Diener, 2001). For example, Tellegen and colleagues (1988) found that genetic influences were greatest for negative emotions, but socialization influences were greater for positive emotion. Similarly, Scollon et al. (2004) found greater

measurement convergence for negative affect than positive affect measures. Thus, we would expect to find an asymmetry of effect between pleasant and unpleasant emotions.

Supporting evidence. A pattern of results similar to our predictions was found in a reexamination of data collected in Japan as part of a separate study (Oishi, Diener, Scollon, Biswas-Diener, 2004; Scollon, et al., 2004; Scollon, Diener, Oishi, & Biswas-Diener, 2005). In the Japanese sample, participants reported norms and took part in a week long experience sampling session (Days 1-7). On Day 7, the participants recalled their emotions for Days 1-7. On Day 14, participants again recalled their emotions from Days 1-7. The data showed that the correlation between emotion norms and retrospective reports of emotion was greater than the correlation between emotion norms and on-line reports of emotion. The findings suggest that norms are operating on memory for emotion and not experience of emotion. Again, the effect of norms on recall was greater for pleasant than unpleasant emotion. The Japanese data did have some limitations. Primarily, norms were measured using a single item "How desirable and functional is it to feel (insert emotion word)?" The item confounded the desirability of an emotion with its functionality. Second, the Japanese data set only measured recall on Days 7 and 14. As the time-frame of recall is extended and on-line experience fades, we would expect norms to have a greater relation to memory for emotions. Finally, it is important to replicate these findings in a non-Japanese sample.

Study 1

Study 1 examined the differential relation between norms and recalled emotions and norms and current mood using a large-scale laboratory study.

Methods

Participants

A total of 69 students (54 female and 15 male) ages 17 to 23 (M = 18.78, SD = 1.32) participated in Study 1 for course credit.

Measures

A summary of means and standard deviations of variables in Study 1 can be found in Table 1.

Table 1. Means and Standard Deviations of Measures for Study 1.

	Mean (SD)	
Measures	Pleasant	Unpleasant
Frequency Recalled	3.25 (.83)	1.84 (.50)
Frequency On-line	1.21 (.71)	1.75 (.74)
Global Norms	5.20 (.46)	3.01 (.70)
Appropriate	5.79 (.66)	3.14 (.94)
Desirable	6.20 (.59)	1.58 (.53)
Functional	2.93 (.10)	5.55 (.82)
Ideal	5.88 (.52)	1.77 (.50)

Recalled Reports of Emotion. Students were asked to report how much they had experienced each of 24 negative and positive emotions "during the last month" (Appendix A). Emotions included happiness, sadness, anger, etc. Participants recalled their emotions from the past month using a 0 (= Never) to 6 (= Always) scale (pleasant emotion: M = 3.25, SD = .83; unpleasant emotion: M = 1.84, SD = .50). We aggregated the 8 pleasant emotions (α = .76) and the 16 unpleasant emotions (α = .73) to form indices of recalled pleasant and unpleasant mood.

On-line Reports of Emotion. Students were asked to report how much they were experiencing each of 24 negative and positive emotions "right now" (Appendix B). The emotion words were the same as those rated in the recall portion. Participants rated their current mood on a 0 (= Not at all) to 6 (= with maximum intensity) scale (pleasant emotion: $\underline{M}$ = 1.21, $\underline{SD}$ = .71; for unpleasant emotion: $\underline{M}$ = 1.75, $\underline{SD}$ = .74). We aggregated the 8 pleasant emotions (α =.73) and the 16 unpleasant emotions (α = .86) to form indices of current pleasant and unpleasant mood.

Norms for Experiencing Emotions. The norm measure consisted of four separate scales using the same 24 negative and positive emotions (Appendix C). Using a 1 (= Never) to 7 (= Always) scale, participants rated the extent to which they believed each of the 24 emotions was appropriate (pleasant emotion: $\underline{M}$ = 5.79, $\underline{SD}$ = .66; for unpleasant emotion: $\underline{M}$ = 3.14, $\underline{SD}$ = .94), desirable (pleasant emotion: $\underline{M}$ = 6.20, $\underline{SD}$ = .59; for unpleasant emotion: $\underline{M}$ = 1.58, $\underline{SD}$ = .53), and functional or adaptive (pleasant emotion: $\underline{M}$ = 2.93, $\underline{SD}$ = 1.00; for unpleasant emotion: $\underline{M}$ = 5.55, $\underline{SD}$ = .82). Finally, students rated how much they thought the "ideal person leading the ideal life" would feel each emotion on a 1 (= never would feel this emotion) to 7 (= always would feel this emotion) scale (pleasant emotion: $\underline{M}$ = 5.88, $\underline{SD}$ = .52; for unpleasant emotion: $\underline{M}$ = 1.77, $\underline{SD}$ = .50). Alphas ranged from .63 (for desirable) to .75 (for functional/adaptive) for specific pleasant emotion norms. Alphas ranged from .81 (ideal) to .92 (appropriate) for unpleasant emotion norms. Intercorrelations between specifics norms for pleasant and unpleasant emotions can be found in Table 2. The discrete emotions for the four norm measures were averaged to form an overall emotional norm score for pleasant ($\underline{M}$ = 5.20, $\underline{SD}$ = .46, α = .84) and unpleasant emotions ($\underline{M}$ = 3.01, $\underline{SD}$ = .70, α = .90). Further, a principal components analysis of the pleasant emotion norms yielded one

factor that explained 55.26% of the variance. A second principal components analysis of the unpleasant emotion norms yielded one factor that explained 37.50% of the variance. The four pleasant emotion norms were therefore averaged to calculate a global pleasant emotion norm and the four unpleasant emotion norms were averaged to calculate a global unpleasant emotion norm.

Table 2. Intercorrelations Between Norms Measures Assessed From Study 1.

Norm	Appropriate	Desirable	Functional	Ideal
Appropriate		-.04	.12	-.10
Desirable	.55 **		-.05	.04
Functional	.19	.04		.00
Ideal	.28*	.45**	.04	

*. Indicates the correlation is significant to the .05 level.

**. Indicates the correlation is significant to the .01 level.

The lower triangle represents the correlations for positive emotions.

The upper triangle represents the correlations for negative emotions.

Procedures

Participants received a packet containing the on-line reports of emotion, the recalled reports of emotion, the norms for experiencing emotion, and demographic information. The on-line measure and the recalled measure were counterbalanced, such that half the participants completed the on-line measure first, followed by the recalled measure. The remaining participants completed the recalled measure first, followed by the on-line measure. The norm measures were always completed after the recalled and on-line measures. After completion of the packet, students were thanked and debriefed.

Results and Discussion of Study 1

We used Steiger's test for dependent correlations to investigate the difference between the correlations between norms and on-line reports of emotion and norms and recalled reports of emotion. As shown in Table 3, the correlation between emotion norms and retrospective reports of emotion was greater than the correlation between emotion norms and on-line reports of emotion (Pleasant emotions r: .57 vs. -.02, t (70) = 3.99, p < .01; Unpleasant emotions r: .28 vs. -.07, t (70) = 2.33, p < .05) (Cohen & Cohen, 1983; Steiger, 1980). As predicted, the effect of norms on recall was greater for pleasant than unpleasant emotion (.57 vs. .28, z = 3.01, p < .01) (Cohen & Cohen, 1983).

Table 3. Correlations Between Norms and Emotion Reports by Time-Frame of recall from the Study 1.

Time-Frame	Pleasant emotion	Unpleasant emotion
Current ("right now")	-.02[a]	-.07 [a]
Recalled ("past month")	.57[** b]	.28[* c]

*. Indicates the correlation is significant to the .05 level.

**. Indicates the correlation is significant to the .01 level.

Did reports of recalled emotion relate to people's norm ratings? To address our question, we compared the two counterbalanced conditions. Half of the participants reported their current mood followed by recalled emotions, followed by norms. The other half reported recalled emotions first, followed by current mood and then norms. If the effects we observed were simply due to priming, then norms should correlate more with the more proximal measure. However, we did not find support for a priming effect. Please see Table 4 for a summary of results.

Table 4. Correlations Between Norms and Emotion Reports by Time-Frame of recall from the Study 1 for Both Forms of Questionnaire.

Time-Frame	Pleasant emotion	Unpleasant emotion
Current First		
Current ("right now")	.11[a]	-.13 [a]
Recalled ("past month")	.69[b]	.06 [a]
Recalled First		
Current ("right now")	-.09[a]	-.08 [a]
Recalled ("past month")	.42[** b]	.37[* c]

*. Indicates the correlation is significant to the .05 level.

**. Indicates the correlation is significant to the .01 level.

Although there was a slightly greater correlation between norms and recalled pleasant emotion when recalled emotion was reported last (Pleasant emotions $\underline{r} = .69$, $\underline{p} < .01$; Unpleasant emotions $\underline{r} = .06$, $\underline{p} < .01$), the effect of norms correlating more strongly with recalled emotions than current mood still emerged when recalled emotions were reported first and current mood was reported last (Pleasant emotions $\underline{r} = .42$, $\underline{p} < .01$; Unpleasant emotions $\underline{r} = .37$, $\underline{p} < .01$). For unpleasant emotions, there was a stronger correlation between norms and recalled emotion when recalled emotions were reported first, a pattern that contradicts a priming effect.

Study 1 Summary

Emotion norms were more strongly related to retrospective reports of emotions than they were to on-line reports. In other words, the emotion norms were differentially related to reports of emotion depending on the time-frame of recall. Thus, it appeared that norms were influencing memory for emotion and not the experience of emotion. Furthermore, the

finding that norms had a greater effect on recall of pleasant than unpleasant emotions was also consistent with previous research (Eid & Diener, 2001; Scollon, et al., 2004; Tellegen, et al., 1988). Our findings support the idea that pleasant emotion is more open to cultural influence, where unpleasant emotion is more strongly tied to neurobiological mechanisms (Eid & Diener, 2001). Thus, we would expect to find an asymmetry of effect between pleasant and unpleasant emotions.

A similar pattern emerged when the data were examined by counterbalancing order. Stronger correlations still emerged between recalled reports of emotion and norms than for on-line reports of emotion and norms, even when recalled emotions were reported first and thus were more distal in relation to the norm ratings. The pattern of findings is incompatible with a priming explanation.

Limitations of Study 1

On-line ratings in the laboratory. Although promising, Study 1 had some limitations. The major limitation was that on-line emotion was measured in a neutral setting. Although participants reported a range of emotions at that time, their moods were relatively mild compared to their natural emotional experience. The restricted range of current emotion may have attenuated the correlation between emotion norms and current mood. A more natural and representative sample of people's on-line emotions is necessary.

Recalling from different time periods. Another concern with Study 1 is that on-line ratings and recalled reports were from different time periods, and therefore were not isomorphic.

Assessment of emotion norms and their stability. Another limitation of Study 1 was in how we measured norms. Although we found no evidence for a priming effect (greater

correlations between proximal measures and norms), having participants complete norm ratings and emotion ratings in the same setting was not ideal. In addition, Study 1 assessed norms only once, which precludes computing stability estimates of norm ratings. If indeed people's perceptions of norms are easily influenced by salient and fluctuating information, we would expect to find low test-retest correlations for norms.

Study 2

To address the limitations of Study 1, we altered several of the procedures for Study 2. To obtain a more natural and representative sample of people's on-line emotions, we used experience sampling to capture people's on-line emotion. To assure that differences in momentary and recalled reports of emotions are due to norms, in Study 2, we asked the participants to recall the same time period from which they made on-line ratings. Further we had people complete multiple measures of norms in Study 2 in order to investigate the stability of norms across time.

As part of a separate, but related research interest, in Study 2 we wanted to investigate the relation between trait information and variability of emotion. Frequency, intensity, and variability have been demonstrated as independent aspects of emotional experience (Diener, Scollon, & Lucas, 2004). In addition to having greater overall levels of negative affect, individuals high in neuroticism also experience more variability in their emotions than individuals low in neuroticism (Larsen & Ketelaar, 1991). Previous research on memory for emotions, including Study 1, has focused on the frequency of emotion in recall. For instance, Feldman Barrett (1997) found that neurotic individuals tend to overestimate the amount of negative emotion they experienced on-line, while extraverted individuals tended to overestimate the amount of positive emotion they experienced on-line.

Similarly, Diener, Larsen, and Emmons (1984) found people high in positive affect consistently overestimated their on-line pleasant affect when recalling their emotions, whereas people high in negative affect overestimated their on-line of negative affect when recalling their emotions. Both studies and Study 1, however, asked participants to recall the amount of emotion they had experienced. Given that frequency, intensity, and variability are separable, we sought to explore whether the same inaccuracies that bias recall of frequency would also be reflected in the recall of variability. That is, do neurotic individuals also overestimate the variability in their emotions? Do extraverted individuals underestimate their variability? We explored memory for variability by allowing individuals to graph their emotional variability from the experience sampling week.

The entire study took 21 days to complete and occurred in four parts. First, participants came to the laboratory and completed self-report measures including an assessment of norms for experiencing emotions and global reports about their personality and emotions. Participants then received a palm pilot computer which they carried with them at all times for 7 days. The palm pilot was used to assess the participant's momentary emotions. At the end of the experience sampling portion, participants returned the palm pilots to the laboratory and completed measures of recalled emotion. Participants returned to the laboratory two additional times to complete measures of recalled emotion before being debriefed. Table 5 summarizes the procedures for Study 2.

Table 5. A Time Table for Study 2.

Days	Session	Measures and Procedures
Day 1	Global Measures & ESM	Informed Consent Norm Measure $_{Day1}$ Satisfaction With Life Scale $_{Day1}$ Satisfaction With Life Scale Norm Introversion/Extraversion Scale Demographics Given palm pilot
Day 3	ESM	Recall Emotions from Days 1-3 $_{Day3}$
Day 7	ESM	Return Palm Pilot & download remaining data Recall Emotions from Days 1-7 $_{Day7}$
Day 14	Recall	Recall Emotions from Days 1-7 $_{Day14}$
Day 21	Recall	Recall Emotions from Days 1-7 $_{Day21}$ Norm Measure $_{Day21}$ Satisfaction With Life Scale $_{Day21}$ Recalled Satisfaction With Life Scale Graph Emotional Variability from Days 1-7

Methods

Participants

Eighty-seven undergraduate students from upper division psychology courses participated for extra credit. Four participants were excluded for failing to complete all measures, leaving data from 83 participants (60 females, 23 males), ages 18 to 44 ($\underline{M}$ = 21.18, $\underline{SD}$ = 3.34) for analyses.

Measures

A summary of the means and standard deviations of variables for Study 2 can be found in Table 6. The top portion of Table 6 displays the means standard deviations for non-valanced variables. The bottom portion of Table 6 displays a summary of the means and standard deviations for valanced variables. A summary of the correlations between non-valanced variables for Study 2 can be found in Table 7.

Table 6. Means and Standard Deviations for Study 2 for Measures.

Measures	Mean (SD)
SWLS	4.93 (1.13)
SWLS Norm	6.32 (.77)
SWLS Recalled	3.98 (1.45)
Extraversion	3.29 (.73)
Neuroticism	2.50 (.76)
On-line Variability	66.99 (11.99)
On-line Intensity	2.13 (.44)
Recalled Variability	1.29 (.55)
Recalled Intensity	1.36 (.74)

	Mean (SD)	
Measures	Pleasant	Unpleasant
Norms	5.76 (.53)	2.64 (.42)
Appropriate	5.44 (.82)	3.41 (.63)
Desirable	6.19 (.55)	1.86 (.61)
Functional	5.41 (.69)	3.18 (.73)
Ideal	5.98 (.69)	2.13 (.82)
Frequency On-line	78.04 (15.09)	45.82 (15.85)
Frequency Recalled Day 3	45.80 (17.77)	25.17 (14.07)
Frequency Recalled Day 7	51.53 (19.58)	25.96 (14.35)
Frequency Recalled Day 14	49.45 (18.97)	26.61 (15.30)
Frequency Recalled Day 21	49.16 (20.26)	25.03 (14.22)

Table 7. Correlation Between Non-valanced Variables for Study 2.

Measure	SWLS Norm	SWLS Recall	Extra.	Neur.	OV	OI	RV	RI
SWLS	.28*	.64**	.26*	-.52**	-.43**	-.02	-.29**	.41**
SWLS Norm		.11	-.13	-.01	-.04	.02	.01	.16
SWLS Recall			.08	.58**	-.40**	-.05	-.45**	.53
Extraversion				-.20	-.15	.24*	-.17	.24*
Neuroticism					.37**	-.10	.33	-.46**
On-line Var. (OV)						-.08	.33**	-.38**
On-line Int. (OI)							-.26**	.22
Recalled Var. (RV)								-.41**

*. Indicates the correlation is significant to the .05 level.

**. Indicates the correlation is significant to the .01 level.

Norms for experiencing emotions. Study 2 used a similar set of norm measures to Study 1, but the Study 2 measures contained some different emotions and fewer emotions (Appendix D). The norm measures once again included Appropriate (pleasant emotion: $\underline{M}$ = 5.44, $\underline{SD}$ = .82; for unpleasant emotion: $\underline{M}$ = 3.41, $\underline{SD}$ = .63), Desirable (pleasant emotion: $\underline{M}$ = 6.19, $\underline{SD}$ = .55; for unpleasant emotion: $\underline{M}$ = 1.86, $\underline{SD}$ = .61), Functional/Adaptive (pleasant emotion: $\underline{M}$ = 5.41, $\underline{SD}$ = .69; for unpleasant emotion: $\underline{M}$ = 3.18, $\underline{SD}$ = .73), and "the ideal person leading the ideal life" (pleasant emotion: $\underline{M}$ = 5.98, $\underline{SD}$ = .69; for unpleasant emotion: $\underline{M}$ = 2.13, $\underline{SD}$ = .82). Emotions for Study 2 included anxious, calm, sad, happy, worried, guilty, irritated, proud, joyful, sociable, excited, bored, pleasant, and unpleasant.

We aggregated the discrete emotions to make pleasant and unpleasant emotion indices. Happy, calm, proud, sociable, excited, and joyful were averaged to create a pleasant emotion score, and guilty, irritated, sad, bored, anxious, and worried formed an unpleasant emotion score. Alphas ranged from .84 (for appropriate and functional) to .64 (desirable) for pleasant emotion norms. Alphas ranged from .81 (ideal) to .65 (functional/adaptive) for unpleasant emotion norms. The decision to aggregate the emotions was based on several similar lines of research (e.g., Kim-Prieto, Diener, & Fujita, 2004; Scollon et al., 2004; Scollon et al., 2005). We also chose to use indices of pleasant emotion and unpleasant emotion for the measure for two additional reasons. First, we did not have predictions about how the use of norms would vary by specific emotion. Second, the composite scores form more reliable measures and provide a useful framework for interpreting our results.

Intercorrelations between specifics norms for pleasant and unpleasant emotions can be found in Table 8. The discrete emotions for the four norm measures were averaged to

form an overall emotional norm score for pleasant (M = 5.76, SD = .53, α = .87) and unpleasant emotions (M = 2.64, SD = .42, α = .76). Further, a principal components analysis of the pleasant emotion norms yielded one factor that explained 54.12% of the variance. A second principal components analysis of the unpleasant emotion norms yielded one factor that explained 39.42% of the variance. The four pleasant emotion norms were therefore averaged to calculate a global pleasant emotion norm and the four unpleasant emotion norms were averaged to calculate a global unpleasant emotion norm. The pleasant emotion index for norms was negatively correlated with the unpleasant emotion index for norms (r = -.28, *p* < .01). This finding is consistent with previous research that has demonstrated that pleasant and unpleasant emotions are independent, but related to on another (Schimmack, 2001).

Table 8. Intercorrelations Between Norms Measures Assessed on Day 1.

Norm	Appropriate	Desirable	Functional	
Appropriate		.23*	.41 **	-.06
Desirable	.35 **		.12	.10
Functional	.25 *	.48 **		.19
Ideal	.17	.60 **	.40 **	

*. Indicates the correlation is significant to the .05 level.

**. Indicates the correlation is significant to the .01 level.

The lower triangle represents the correlations for positive emotions.

The upper triangle represents the correlations for negative emotions.

Life satisfaction. The Satisfaction With Life Scale is a five-item scale designed to assess an individual's overall satisfaction with life (Diener, Emmons, Larsen, & Griffin, 1985) (Appendix E). Students received a list of five statements that they could agree or disagree with, for example "The conditions of my life are excellent." Participants indicated

the extent to which they agreed or disagreed with each statement using a 1 (= Disagree Strongly) to 7 (= Agree Strongly) scale ($\underline{M}$ = 4.93, $\underline{SD}$ = 1.13, α = .81).

Norms for life satisfaction. Students then completed an altered version of the five-item Satisfaction With Life Scale (Appendix F). Participants indicated the extent to which the "ideal person" leading the "ideal life" would agree or disagree with each statement using a 1 (= Disagree Strongly) to 7 (= Agree Strongly) scale ($\underline{M}$ = 6.32, $\underline{SD}$ = .77, α = .79).

Extraversion and neuroticism. The personality scales consisted of a ten-item extraversion scale and a ten-item neuroticism scale taken from the International Personality Item Pool (Goldberg, 1999) (Appendix G). Students were given a list of 20 statements that could describe them, for example, "I am often down in the dumps." Using a 1 to 5 scale, where 1 indicates "very inaccurate" and 5 indicates "very accurate," participants indicated the extent to which the statement accurately described them (extraversion: $\underline{M}$ = 3.29, $\underline{SD}$ = .73, α = .86; neuroticism: $\underline{M}$ = 2.50, $\underline{SD}$ = .76, α = .82).

Demographics. Students completed a brief demographic survey asking them to indicate their age, sex, ethnicity, religious affiliation, educations level, martial status, and college major (Appendix H).

Experience sampling emotion questionnaire. When signaled, students completed a short survey on their current emotions, including questions such as "How happy were you feeling?" (Appendix I) Participants rated the intensity of the emotion on a 1 (= Not at all) to 5 (= with maximum intensity) scale for all discrete emotions. Pleasantness and unpleasantness were rated using a sliding continuum where one extreme of the continuum indicated feeling unpleasant and the other extreme indicated feeling pleasant. The question appeared as follows on the respondent's palm pilot computer.

Unpleasant----------||----------Pleasant

Participants indicated how pleasant or unpleasant they were feeling by sliding the middle bar to the left or right to the corresponding degree.

Details about experiencing sampling are described later. Again, we aggregated the discrete emotions to make pleasant and unpleasant emotion indices. Happy, calm, proud, sociable, excited, and joyful were averaged to create a pleasant emotion score, and guilty, irritated, sad, bored, anxious, and worried formed an unpleasant emotion score (pleasant emotion $\alpha = .95$; unpleasant emotion $\alpha = .76$). The on-line pleasant emotion index was only weakly correlated with the on-line unpleasant emotion index ($\underline{r} = .08$, *ns.*). This finding is consistent with previous research that has demonstrated that pleasant and unpleasant emotions are independent, but related to one another (Schimmack, 2001). The pleasant-unpleasant slider question was treated as a single-item measure.

Recalled emotions. Students recalled the percentage of time they felt each of the negative and positive emotions during Days 1-7 (experience sampling week) (Appendix J). They were informed that "numbers do not need to add up to 100% since you may have felt more than one emotion at a time." We again aggregated the discrete emotions to make pleasant and unpleasant emotion indices for each time-frame of recall (Day 3: pleasant: $\underline{M} = 45.80$, $\underline{SD} = 17.77$, unpleasant: $\underline{M} = 25.17$, $\underline{SD} = 14.07$: Day 7: pleasant: $\underline{M} = 51.53$, $\underline{SD} = 19.58$, unpleasant: $\underline{M} = 25.96$, $\underline{SD} = 14.35$: Day 14: pleasant: $\underline{M} = 49.45$, $\underline{SD} = 18.97$, unpleasant: $\underline{M} = 26.61$, $\underline{SD} = 15.30$: Day 21: pleasant: $\underline{M} = 49.16$, $\underline{SD} = 20.26$, unpleasant: $\underline{M} = 25.03$, $\underline{SD} = 14.22$). Happy, calm, proud, sociable, excited, and joyful were averaged to create a pleasant emotion score, and guilty, irritated, sad, bored, anxious, and worried formed an unpleasant emotion score. Alphas ranged from .87 (for recall on Day 21) to .81 (for recall

on Day 3) for pleasant emotion norms. Alphas ranged from .79 (for recall on Day 21) to .70 (for recall on Day 3) for unpleasant emotion norms. The pleasant emotion index was negatively correlated with the unpleasant emotion index ($r = -.29$, $p < .01$.). This finding is consistent with previous research that has demonstrated that pleasant and unpleasant emotions are independent, but related to on another (Schimmack, 2001).

Recalled life satisfaction. Students then completed a second altered version of the five-item Satisfaction With Life Scale (Appendix K). Participants indicated the extent to which they agreed that each statement described their experiences during Days 1-7 using a 1 (= Disagree Strongly) to 7 (= Agree Strongly) scale, for example "I was satisfied with my life the week I carried the palm pilot" ($M = 3.98$, $SD = 1.45$, $\alpha = .91$).

Recalled variability in emotions. Students were shown an example graph of "the variability in emotions one might experience over an average day." (Appendix L) After viewing the sample, students estimated and graphed their own emotion patterns from Days 1-7 (experience sampling week). A research assistant coded the height of the participant's graph at seven systematic locations for each of the days, resulting in 49 systematic points along the participant's graph on a 3 (= intensely pleasant) to -3 (= intensely unpleasant) scale ($M = 1.29$, $SD = .55$, $\alpha = .93$). The standard deviation of the 49 points was used as an indicator of recalled variability of emotions.

Recalled intensity of emotions. We computed the mean level of recalled intensity for pleasant and unpleasant emotions by summing a person's recalled ratings for the systematic points along the participant's graph and dividing by 49 ($M = 1.36$, $SD = .74$).

On-line frequency of emotions. Following the procedures of Scollon and colleagues (2004) ratings on the 12 emotions for each occasion were transformed into dichotomous

variables indicating whether the emotion was experienced (i.e., a response greater than one) or not (i.e., a response of one). We then computed the proportion of time each discrete emotion was reported over the week period. Thus, values reflect the percentage of time an emotion was experienced and do not take into account the intensity of the emotion (pleasant: M = 78.04, SD = 15.09; unpleasant: M = 45.82, SD = 15.85).

On-line variability of emotion. The standard deviation of the experience sampling pleasant-unpleasant slider question was used as an indicator of on-line variability of emotion (M = 66.99, SD = 11.99).

On-line intensity of emotions. We computed the (week-long) mean level of intensity for each of the twelve emotions by summing a person's ratings on each emotion and dividing by the total number of occasions on which the emotion rating was greater than one (M = 2.13, SD = .44). In other words, the score reflects the mean level of intensity for a particular emotion only when that emotion was felt (for further discussion of the rationale of the procedure, see Diener, Larsen, Levine, & Emmons, 1985).

Procedures

Day 1. Table 5 summarizes the procedures for Study 2. Participants completed a standard consent form (Appendix M). Participants then completed a questionnaire that contained the norm measures, the Satisfaction With Life Scale, the Satisfaction With Life Scale norm measure, the Neuroticism/Extraversion Scale, and the demographic survey. Participants also received a palm pilot computer, which we explained how to use. Participants were informed that the computer would "signal" them 7 times each day during a 13-hour period (9 a.m. to 10 p.m. or 10 a.m. to 11 p.m.), and each time it did, they were to complete the experience sampling questionnaire on the palm pilot computer. Participants

had up to 30 minutes to respond when signaled, after which the survey was no longer accessible. Participants were instructed to respond to the questionnaire according to how they were feeling just before they were signaled to reduce reactivity effects. The palm pilot questionnaire was accessed using the Experience Sampling Program 4.0 (ESP; Feldman Barrett & Barrett, 2005). The palm pilots were preprogrammed to survey participants at seven randomly selected occasions per day for the entire week. The average response rate was 84.73% (SD = 12.79).

Day 3. Participants returned to the laboratory and recalled their emotions for Days 1-3. Although the palm pilot battery could last well beyond the experience sampling week, we took the opportunity to recharge the palm pilots as a precautionary measure.

Day 7. Participants returned the palm pilot computers and recalled their emotions form Days 1-7.

Day 14. Participants returned to the laboratory and recalled their emotions from Days 1-7.

Day 21. Participants returned to the laboratory and recalled their emotions from Days 1-7. After free recall of their emotions from Days 1-7, participants completed the norm measures and the Satisfaction With Life Scale once again. Next, participants recalled their satisfaction with life from Days 1-7 and recalled what they were doing each time the palm pilot signaled them. Participants then graphed the variability of their emotions during Days 1-7. Finally, participants were debriefed and dismissed.

Results and Discussion

Study 2 had three major hypotheses. First, we hypothesized that emotion norms operate on recalled emotions, not on momentary experiences. If our first hypothesis was

correct, we would expect a stronger correlation between norms and recalled emotions compared to the correlation between norms and experiencing sampling affect. By contrast, if emotion norms operate in momentary emotion, not recalled emotion, we would expect to find a comparable correlation between norms and experiencing sampling reports of emotions compared to the correlation between norms and recalled reports of emotion. Second, we expected norms to be more strongly related to pleasant than to unpleasant emotions. If our second hypothesis was accurate, we would expect the correlation between norms and recall to be greater for pleasant emotions than for unpleasant emotions. Third, we predicted that as the time-frame of recall increases, direct accesses to the emotional experience would fade and norms would become increasingly incorporated into the reconstruction of the memory for emotion. Thus, we would expect to see increases in the correlation between norms and recalled emotions as the time-frame of recall increase. By contrast, if norms do not become increasingly incorporated into the reconstruction of the memory for emotion we would expect to find no difference between the time-frames of recall.

Convergence and Divergence of the SWB measures

We first wanted to replicate the finding that the SWB measures are moderately related to each other. Specifically, we were interested in the relationship between on-line and retrospective measures of emotion. We examined the relation between on-line reports of emotion and Day 14 recall. Consistent with previous research (Wirtz, et al., 2003), we found moderate convergence of on-line and retrospective reports of emotion (pleasant: $\underline{r} = .63$, $\underline{p} < .01$; unpleasant: $\underline{r} = .45$, $\underline{p} < .01$).

Relation of norms, experiencing sampling emotion, and recalled emotion

To address our first hypothesis that emotion norms operate on recalled emotions, not on momentary experiences, we examined the relationship between norms taken on Day 1, experiencing sampling emotion, and recalled emotion taken on Day 14. We used the Day 14 recalled emotion because past research has used a 14 day time-frame to examine the relation between reports of experience sampling and memory for emotion (Feldman Barrett, 1997; Scollon, et al., 2004).

Norms, experience sampling, and recall on Day 14. We compared the correlations for frequency of experience sampling emotion and Day 14 recall reports of emotion for pleasant and unpleasant emotion norms. Although norms were measured at the beginning of Day 1 and the end of Day 21 of the study, all comparisons involve norm measures on Day 1 to reduce the shared variance in the recalled reports of norms. A summary of the results can be found by comparing line 1 and line 4 for each norm in Table 9.

Table 9. Correlations Between Norms and Pleasant Versus Unpleasant Emotions for Specific Time-Frames.

Time-Frame	Pleasant	Unpleasant
On-line	**.33****	**.02**
Day 3	.41**	.19
Day 7	.37**	.18
Day 14	**.44****	**.18**
Day 21	.37**	.22**

*. Indicates the correlation is significant to the .05 level.

**. Indicates the correlation is significant to the .01 level.

We found mild support for our first hypothesis that norms are more strongly related to recall than momentary experiences, at least for pleasant emotions. The correlation between

emotion norms and retrospective reports of emotion was marginally greater than the correlation between emotion norms and on-line reports of emotion (Pleasant emotions r: .44 vs. .33, t (79) = -1.27, p < .10; Unpleasant emotions r: .18 vs. .02, t (79) = -1.38, p < .10) (Cohen & Cohen, 1983; Steiger, 1980). As predicted, the effect of norms on recall was greater for pleasant than unpleasant emotion (.44 vs. .18, z (79) = 1.83, p < .05) (Cohen & Cohen, 1983). Further, we found no differences in the correlations between norms and recalled frequency of emotion after controlling for on-line variability of emotion.

Norms and time-frame of recall. Next, we examined the relationship between norms taken on Day 1, experiencing sampling frequency of emotion, and each time-frame of recall separately. A summary of the results for pleasant and unpleasant emotion can be found in Table 9. Contrary to our hypothesis, we did not find an increasing relationship between norms and recall as the time-frame for recall increased for either pleasant or unpleasant emotion. The correlation between norms and recall was consistent, even as greater time had elapsed for recall.

Norms and pleasant versus unpleasant by time-frame of recall

We also compared the correlations for pleasant and unpleasant emotion for each time-frame of recall separately. A summary of the results for pleasant versus unpleasant emotions for specific time-frames can be found in Table 9. Norms were uncorrelated with momentary unpleasant emotion and mostly uncorrelated with recalled unpleasant emotions (significant only for the unpleasant Day 21: r = .22, *p* < .05). For pleasant emotions, norms significantly correlated with on-line and recalled pleasant emotions. Consistent with our second hypothesis, norms were more strongly correlated with memory for pleasant and not unpleasant emotion. Further, for the most part the differences between the pleasant and

unpleasant correlations were statistically significant (Online: .33 vs. .02, z (79) = 2.04, p < .05; Day 3: .41 vs. .19, z (79) = 1.54, p < .10; Day 7: .37 vs. .18, z (79) = 1.30, p < .10; Day 14: .44 vs. .18, z (79) = 1.83, p < .05; Day 21: .37 vs. .22, z (79) = 1.04, *ns*) using Fisher's test for independent correlations (Cohen & Cohen, 1983).

Stability of Recall

We examined the stability of retrospective reports of emotion across time. The test-retest correlation indicated high stability of recalled reports of pleasant and unpleasant emotion from Day 3 to Day 21 recall (pleasant: r = .83, *p* < .01; unpleasant: r = .79, *p* < .01).

Norms

Stability of norms. Next, we wanted to examine the stability of norms across time. Table 10 presents the stability coefficients for norms over the 21-day interval. The test-retest correlations indicate moderate stability of norms across time. Stability coefficients for pleasant emotion norms ranged from α = .41 (for appropriate and desirable) to α = .56 (for ideal). Stability coefficients for unpleasant emotion norms ranged from α = .30 (for desirable) to α = .49 (for ideal).

Table 10. Stability Coefficients for Norm About Pleasant and Unpleasant Emotions.

Norm	Pleasant	Unpleasant
Appropriate	.41**	.40 **
Desirable	.41 **	.30 **
Functional	.49 **	.57 **
Ideal	.56 **	.49 **

*. Indicates the correlation is significant to the .05 level.

**. Indicates the correlation is significant to the .01 level.

The Relation Between Day 1 Norms, Day 21 Norms, and Recall at Day 21. We then compared the correlations between recall on Day 21 and norms taken on Day 1 to the correlations between recall on Day 21 and norms taken on Day 21. We found that the correlations between recall on Day 21 and norms taken on Day 1 versus norms taken on Day 21 were not significantly different for either pleasant (r: .37 vs. .44, t (79) = -.88, *ns*) or unpleasant (r: .22 vs. .16, t (79) = .51, *ns*) emotion.

Life satisfaction

Stability. The stability of life satisfaction over a 21-day interval was quite high (r = .79, α = .88). Our finding is consistent with previous research indicating that the Satisfaction With Life Scale is highly stable and reliable across time (r = .82, α = .87, Pavot & Diener, 1993). Thus, it seems that life satisfaction is more stable than norms across time.

Norms and recalled life satisfaction. We next examined the relationship between life satisfaction norms, scores on the Satisfaction With Life Scale, and recalled life satisfaction for Days 1-7. The correlation between the life satisfaction norms and global reports of life satisfaction was marginally greater than the correlation between the life satisfaction norm and recalled reports of life satisfaction (r: .11 vs. .28, *t* (79) = 1.92, *p* =.10, Cohen & Cohen, 1983; Steiger, 1980). Our findings are consistent with the Time-Sequential model of SWB (Kim-Prieto, et al., in press) in that the broader or more global the assessment, the more likely norms will be incorporated in the report. In other words, overall life satisfaction reports are less specific and time bound than recalled reports, so we would expect norms to be strongly incorporated in overall life satisfaction reports. These findings are not to say that recalled life satisfaction and global satisfaction with life are not highly related to each other.

In fact, the two are highly related (r = .64, p = .05). This high level of convergence between the SWB is a well replicated finding in the SWB literature (Wirtz, et al., 2003)

Recalled emotional variability

Zero-order correlations among variability variables are shown in Table 11.

Table 11. The Zero-order Correlations Among Variability Variables.

Variable	Recalled Variability	On-line intensity	Recalled Intensity
On-line Variability	-.22*	.05	.34**
Recalled Variability		-.26 *	-.41**
On-line Intensity			.22**

*. Indicates the correlation is significant to the .05 level.

**. Indicates the correlation is significant to the .01 level.

We did not have specific predictions about the accuracy of people's recollection of variability. However, we looked at the correlation between on-line and recalled variability of emotion and found little convergence between the two measures of variability (r = -.22, p < .05). We next looked at the relationship between trait information and variability. Larsen and Ketelaar (1991) have demonstrated that in addition to having greater overall levels of negative affect, neurotic individuals also experience more variability in their emotions than extraverted individuals. Further, Feldman Barrett (1997) found that neurotic individuals tend to overestimate the amount of negative emotion they experienced on-line, while extraverted individuals tended to overestimate the amount of positive emotion they experienced on-line. Based on the past research showing that stable individual differences in neuroticism predict differences in variability for experience of emotion (i.e. Larsen & Ketelaar, 1991), we predicted that neuroticism would predict greater memory for variability of emotions, but that extraversion would not.

To determine whether neuroticism and extraversion predict memory for variability of emotion after controlling for on-line variability (from the experiencing sampling pleasant/unpleasant slider question), we regressed the retrospective measure of variability (from the graphing task) onto neuroticism, extraversion, and on-line variability. As predicted, extraversion was unrelated to memory for variability of emotion, but neuroticism predicted memory for variability even after controlling for on-line variability. In fact, when predicting memory for variability, neuroticism was as good a predictor as on-line variability, as demonstrated by the nearly equal magnitudes of beta weights (neuroticism: $\beta = .23$, t (79) = 2.04, $p < .05$; on-line variability: $\beta = .23$, t (79) = 2.07, $p < .05$). Our findings indicate that with increasing levels of neuroticism people recall more variability in their emotions above and beyond their on-line variability of emotion. Our findings further suggest that trait information is not only implicated in people's memory for the amount of emotion experienced, but that trait information also informs people's memory of the variability of their emotional experiences.

We further wanted to assure this relationship was not an artifact of floor and ceiling effects due to under or overestimation of emotional variability because the emotional variability graphing task artificially restricted how low or high scores could be. Thus, we conducted the above analysis controlling for deviation of the mean from the midpoint of the scale and found a weaker, but similar, pattern of results (neuroticism: $\beta = .19$, t (76) = 1.80, $p < .10$; on-line variability: $\beta = .34$, t (76) = 3.38, $p < .05$). Again, neuroticism predicted memory for variability even after controlling for on-line variability. However, after controlling for scale use neuroticism was a weaker predictor of recalled variability than on-line variability. These findings suggest that individuals high in neuroticism appear to recall

more variability in their emotions in part because they are more willing to deviate from the midpoint of the scale.

Mediation of recalled variability. We conducted a series of multiple regressions to test the four criteria for mediation (Baron and Kenny, 1986; Frazier, Tix, & Barron, 2004; Shrout & Fleiss, 1979). Specifically, we wanted to investigate whether recalled intensity of emotion mediated the relation between neuroticism and recalled variability. First, we examined whether: (1) the independent variable (neuroticism) was significantly correlated with the outcome variable (recalled variability), (2) the independent variable (neuroticism) was significantly correlated with the mediator (recalled intensity), (3) the mediator (recalled intensity) was significantly correlated with the outcome variable (recalled variability), controlling for the independent variable (neuroticism), and (4) the mediational effect was significant according to the Sobel test.

The first criterion for mediation was met. Neuroticism was significantly correlated with recalled variability (ß = .33, t (81) = 3.16, $p < .01$). The second criterion for mediation was met; neuroticism was significantly correlated with recalled intensity (ß = -.46, t (81) = -4.68, $p < .01$). In support of the third criterion for mediation, recalled intensity was significantly correlated with recalled variability after controlling for neuroticism (ß = -.32, t (81) = -2.83, $p < .01$). Further, the effect of neuroticism on recalled variability diminished after controlling for recalled intensity (ß = .18, t (80) = 1.59, *ns*). A Sobel test revealed that the mediational effect of recalled intensity was significant (Sobel test = -2.41, $p < .05$). Our findings indicate that individuals high in neuroticism incorporate their self beliefs into recall of emotional variability, but the relationship is mediated by recalled intensity. Thus,

individuals high in neuroticism recall more variability because they also remember their emotions as being more intense.

Next, we wanted to assure the mediation was not due to on-line intensity of emotional experience. After all, previous research has demonstrated that individuals high in neuroticism tend to experience more intense emotions (Larsen & Ketelaar, 1991). We replicated the above procedure using on-line intensity as the mediating variable. Again, the first criterion for mediation was met. Neuroticism was significantly correlated with recalled variability (ß = .32, t (81) = 3.05, $p < .01$). The second criterion for mediation was also met: neuroticism was significantly correlated with on-line intensity (ß = -.257, t (81) = -2.38, $p < .05$). However, the third criterion for mediation was not met. On-line intensity was not significantly related to recalled variability after controlling for neuroticism, (ß = .02, t (80) = .14, *ns*). Our findings indicate that the relationship between neuroticism and recalled variability of emotion is completely mediated by recalled intensity and not mediated by on-line intensity.

Finally, we wanted to assure the mediational relationship between neuroticism, recalled intensity, and recalled variability was not due to a floor and ceiling effects. We conducted the mediation analyses for neuroticism, recalled intensity, and recalled variability controlling for deviation of the mean from the midpoint of the scale and found similar pattern of results. Neuroticism was still significantly correlated with recalled variability (ß = .29, t (78) = 2.78, $p < .01$). Neuroticism was still significantly correlated with recalled intensity (ß = -.20, t (78) = -3.66, $p < .01$). Recalled intensity was still significantly correlated with recalled variability after controlling for neuroticism (ß = -1.31, t (77) = -8.28, $p < .01$). However, the effect of neuroticism on recalled variability diminished after controlling for

recalled intensity (ß = .03, t (77) = .34, *ns*). A Sobel test revealed that the mediational effect of recalled intensity was significant (Sobel test = -2.64, $p < .05$) even after controlling for scale usage. Thus, it appears that individuals high in neuroticism recall more variability in their emotions, but again this is because they are more willing to deviate from the midpoint of the scale.

General Discussion

The fundamental interest of the present research was to determine how norms operate on memory for emotion. Previous research has shown memory for emotion is not static, but instead is open to revision and influences beyond the person's on-line experience (Mitchell, Thompson, Peterson, & Cronk, 1997; Robinson, Johnson, & Shields, 1998; Scollon et al., 2004; Feldman Barrett, 1997). Further, recent models of SWB, such as Robinson and Clore's (2002) theory and the Time-Sequential Model of SWB (Kim-Prieto, et al., in press) propose that heuristics intervene between an emotional reaction and the later recall of the emotion. Thus, we hypothesized that emotion norms would have a stronger relation to recalled experiences of emotion than momentary experiences of emotion. We found mild evidence in support of our predictions, although the differences between correlations were only marginally significant.

We were also interested in the effect of norms on recall for pleasant versus unpleasant emotion. Previous research has found pleasant emotions are more open to cultural interpretation whereas unpleasant emotions are strongly tied to neurobiological processes and genetics influences (Eid & Diener, 2001; Tellegen, et al., 1988). Thus, we expected the effect of norms on recall to be greater for pleasant than unpleasant emotion. We found evidence to suggest that the effect of norms was more strongly associated with recalled

pleasant and not unpleasant emotions. Again, however, some of the differences between the correlations were only marginally significant.

Further, we were interested in the pattern of the relationship between norms and emotion as the time-frame of recall increased. Robinson and Clore (2002) suggested that individuals rely on aggregation of episodic information when reporting emotions from a short, discrete time-frame in the not too distant past. However, when remembering longer, more abstract time-frames individuals use semantic information or heuristics, such as the self-concept, implicit beliefs, or norms, to inform their memory for emotions. According to Robinson and Clore's (2002) theory, when using an episodic memory strategy becomes to taxing individuals switch to using a semantic strategy. Further, as the time-frame of recall increases, one would expect the reliance on heuristics also to increase beyond the initial switch from episodic to semantic.

Therefore, we expected that as the time-frame of recall increased and direct accesses to the emotional experience had faded, the correlation between norms and recalled emotion reports would increase. Contrary to our predictions, we found no evidence of an increasing relationship between norms and recalled reports of emotions as the time-frame of recall increased. One possible explanation for our findings is that our measure of recall was not frequent or sensitive enough to capture the increasing relationship between heuristic information and memory for emotion. Also, it is possible that by the end of the experience sampling week participants had already switched from relying on episodic information to a semantic strategy of retrieval. Trying to recall and aggregate emotion from an entire experience sampling week is a difficult task. Perhaps if we had used a shorter on-line assessment it would have been less taxing for participants to recall their emotions from that

discrete time-frame. Thus, we would be able to detect the point at which a switch in the recall strategy occurs and be able to assess the relation of norms recall at various time-frames.

We were also interested in the relationship between traits and memory for variability of emotions. Past research has shown that memory for emotion is influenced by people's emotional self-knowledge. For example, neurotic individuals overestimate in memory the amount of negative emotion they experienced (Feldman Barrett, 1997). In addition to influencing memory for emotion neuroticism has been linked to greater variability in emotional experience (Larsen & Ketelaar, 1991). The present study was the first study to examine the impact of neuroticism on memory for variability of emotions. Extraversion, as expected, was unrelated to memory for variability. We found that neuroticism predicted variability in recalled emotions, even when controlling for on-line variability of emotions. Our findings suggest that trait information was not only implicated in people's memory for the amount of emotion experienced, but that trait information also informs people's memory of the variability of their emotional experiences. Further, the relationship between neuroticism and memory for variability was mediated by recalled intensity. Thus, individuals high in neuroticism recall more variability because they also remembered their emotions as being more intense. Interestingly, on-line intensity did not mediate the effect, only recalled intensity. However, it appears that neuroticism is related to recalling more variability in emotions because neurotic people are more willing to deviate from the midpoint of the scale.

The present study has several implications for the study of emotions. Primarily, the present study provides empirical evidence for the role of norms in memory for emotion that

supports the Time-Sequential Model of SWB (Kim-Prieto, et al., in press). The current study has focused on how one source of heuristic information systematically relates to momentary reports of emotion and recall of emotion over a 21-day period. The current study is one small piece of the overarching model. However, by providing empirical support for the various aspects of the model, emotion researchers will be better able to understand the unitary construct of SWB and how its various components interact over the passage of time. The present study also emphasizes the importance of understanding how beliefs about the self translate into psychological processes, especially memory for one's experiences. Findings from the recalled emotional variability portions of Study 2 suggest that it is necessary to examine both dispositional characteristics (e.g., traits) and on-line experience to fully understand emotional experience and its affects on memory.

Our study also has applications for the measurement of emotion. Researchers and clinicians alike use retrospective reports of emotion, not on-line measures of emotion. The present study suggests that norms may become incorporated in memory for emotion and affect retrospective reports. Therefore, the reports of emotions obtained using retrospective measures may not give an accurate account of an individual's on-line emotional experiences. The precision of such instruments can be improved to the extent that we understand the sources, other than experiences, that are influencing retrospective instruments. Understanding the level at which norms operate on emotion and how norms systematically influence retrospective reports provides valuable information that could improve future studies and provide a more complete account of a patient's emotional life. Given that norms about emotional experience vary widely from culture to culture (Eid & Diener, 2001; Kim-Prieto, Fujita, & Diener, 2004), the present findings suggest that cultural differences in

emotion may be inflated. In fact, past research has shown greater cultural differences when using retrospective reports of emotion (Oishi, et al., 2004; Scollon et al., 2004)

We have several concerns about the interpretations of our studies. First, we recognize that our studies were correlational in nature and that causation between variables was not implied. This caveat is especially important with regard to the regression analyses and the previous Results section. The language of regressions (with their "predictors," "effects," etc.) often sounds causal. It is important to keep in mind that regressions are correlational and that only a study's design can allow for investigations of causality. Second, although the patterns of several of the correlations were consistent with our model, many of the differences were only marginally significant. The low intercorrelations and reliability coefficients of the norm measures call into question the construct validity of emotion norms as an individual difference variable.

A primary goal of future research will be to determine how norms operate on memory of emotions at differing time-frames using a more sophisticated study design. One possible study design would involve a shorter on-line assessment (i.e. a period of hours) and more frequent measures of recall. The aforementioned design would have several advantages over the current study's design. Primarily, recalling ones emotions over a shorter time-frame of recall should be less mentally taxing than recalling ones emotions over a seven day period, so we would be more likely to see gradual change in the use of semantic information. Second, by having frequent measures of recall we would be more likely to identify the pattern at which norms become incorporated into memory for emotion. In the present study, the measures of recall of emotion occurred once every seven days. Decreasing the period of time

between measures of recall will provide a more detailed and accurate picture of the relation between norm and recalled reports of emotion.

Another avenue of future research includes a cross-cultural replication of the recalled emotional variability portion of Study 2. Previous research has found that the impact of generalized self-knowledge on recalled reports of emotion varies across culture (Diener, et al., 2000; Eid & Diener, 2001; Oishi, Diener, Scollon, Biswas-Diener, 2004; Okazaki and Kallivayalil, 2002; Scollon, Diener, Oishi, & Biswas-Diener, 2005). Specifically, while measuring SWB across various societies, researchers have confronted issues regarding the universality of emotions, and how representations of emotions in memory are influenced by cultural norms (Diener & Tov, in press). Cross-cultural comparison of the current findings to societies with differing levels of collectivism and varying social norms could provide insight into the systematic ways cultures differ in their socialization of pleasant and unpleasant affect, and how socialization is reflected in an individual's norms for emotions and one's memory for variability of emotion.

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Figure Caption

Figure 1. The Time-Sequential Model of Subjective Well-Being. (Kim-Prieto, et al., in press)

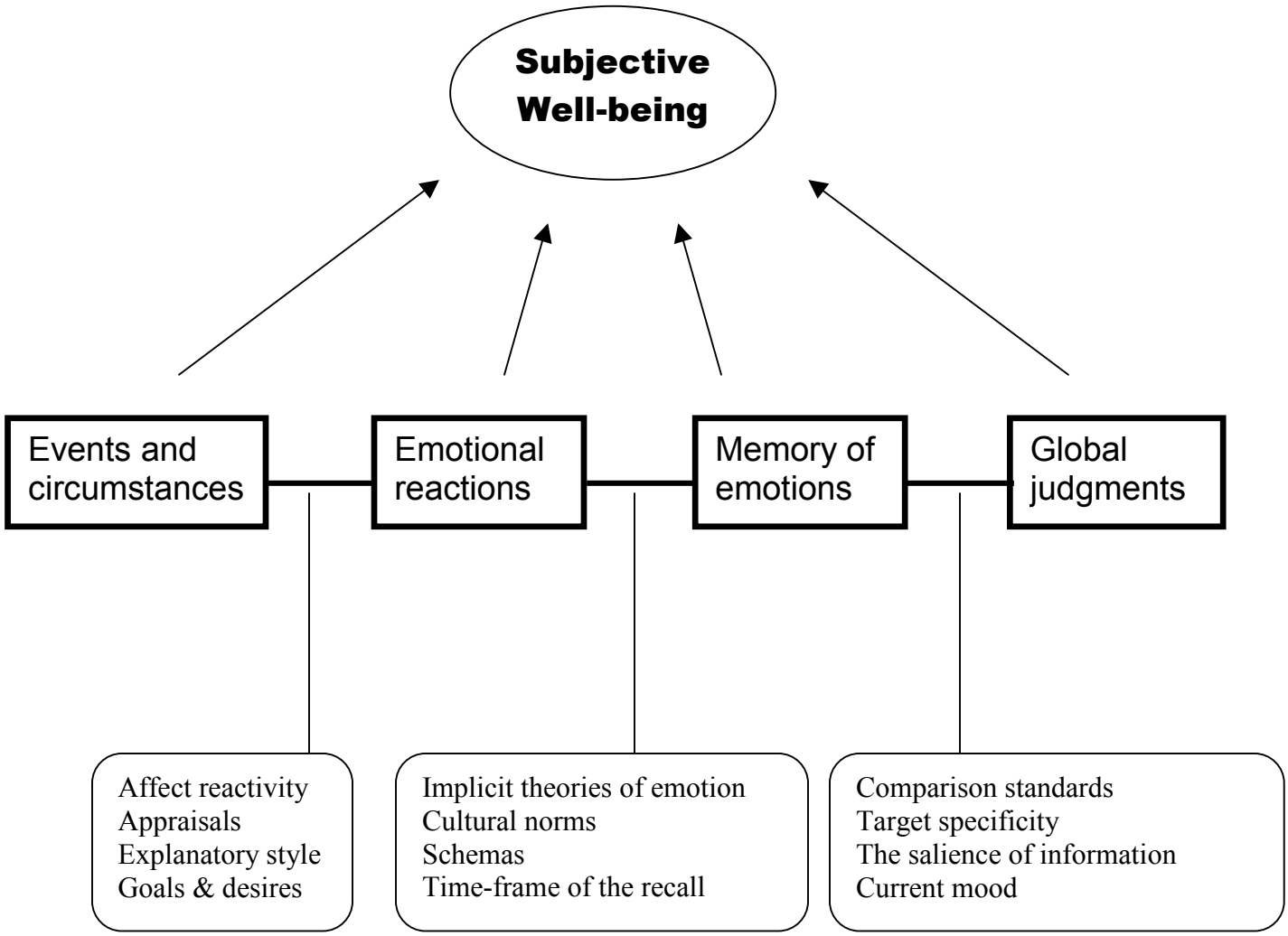
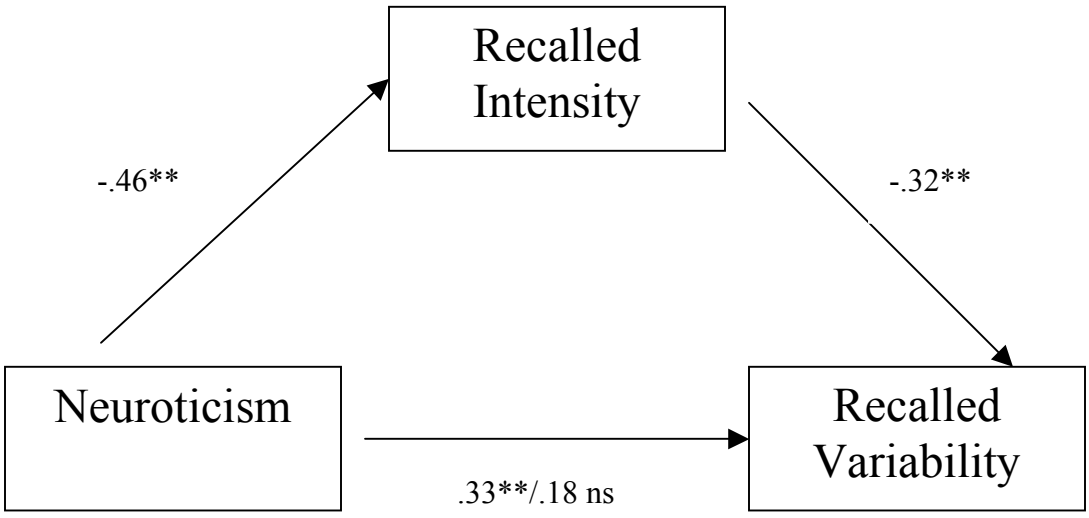

Subjective Well-being
Events and circumstances
Emotional reactions
Memory of emotions
Global judgments
Affect reactivity
Appraisals
Explanatory style
Goals & desires
Implicit theories of emotion
Cultural norms
Schemas
Time-frame of the recall
Comparison standards
Target specificity
The salience of information
Current mood

Figure Caption

Figure 2. The Mediation of Recalled Variability from Neuroticism through Recalled intensity.


Recalled Intensity
-.46**
-.32**
Neuroticism
Recalled Variability
.33**/.18 ns

Appendices

Appendix A- Study 1 Recall Measure

Using the scale below, please indicate how much of the time DURING THE LAST MONTH you have typically felt each emotion.

Never	Slight Amount	Some of The time	Half of the Time	Much of the Time	Almost Always	Always
0	1	2	3	4	5	6

____ 1. Shame
____ 2. Joy
____ 3. Fear
____ 4. Affection
____ 5. Anger
____ 6. Sadness
____ 7. Worry
____ 8. Love
____ 9. Irritation
____ 10. Guilt
____ 11. Happiness
____ 12. Loneliness
____ 13. Anxiety
____ 14. Caring
____ 15. Disgust
____ 16. Regret
____ 17. Contentment
____ 18. Unhappiness
____ 19. Pride
____ 20. Nervousness
____ 21. Fondness
____ 22. Rage
____ 23. Embarrassment
____ 24. Depression

Appendix B- Study 1 On-line Measure

Using the scale below, please indicate the extent to which you are CURRENTLY (i.e., RIGHT NOW) feeling each emotion.

Not at all	Very Slightly	Slightly	Moderately	Strongly	Very Strongly	With Maximum Intensity
0	1	2	3	4	5	6

____ 1. Shame
____ 2. Joy
____ 3. Fear
____ 4. Affection
____ 5. Anger
____ 6. Sadness
____ 7. Worry
____ 8. Love
____ 9. Irritation
____ 10. Guilt
____ 11. Happiness
____ 12. Loneliness
____ 13. Anxiety
____ 14. Caring
____ 15. Disgust
____ 16. Regret
____ 17. Contentment
____ 18. Unhappiness
____ 19. Pride
____ 20. Nervousness
____ 21. Fondness
____ 22. Rage
____ 23. Embarrassment
____ 24. Depression

Appendix C- Study 1 Norm Measures

Using the scale below, please indicate the extent to which you believe it is APPROPRIATE to feel each emotion.

Never Appropriate	--	--	Sometimes Appropriate	--	--	Always Appropriate
1	2	3	4	5	6	7

____ 1. Shame
____ 2. Joy
____ 3. Fear
____ 4. Affection
____ 5. Anger
____ 6. Sadness
____ 7. Worry
____ 8. Love
____ 9. Irritation
____ 10. Guilt
____ 11. Happiness
____ 12. Loneliness
____ 13. Anxiety
____ 14. Caring
____ 15. Disgust
____ 16. Regret
____ 17. Contentment
____ 18. Unhappiness
____ 19. Pride
____ 20. Nervousness
____ 21. Fondness
____ 22. Rage
____ 23. Embarrassment
____ 24. Depression

Appendix C- Study 1 Norm Measures

Using the scale below, please indicate the extent to which you believe it is DESIRABLE to feel each emotion.

Never Desirable	--	--	Sometimes Desirable	--	--	Always Desirable
1	2	3	4	5	6	7

____ 1. Shame
____ 2. Joy
____ 3. Fear
____ 4. Affection
____ 5. Anger
____ 6. Sadness
____ 7. Worry
____ 8. Love
____ 9. Irritation
____ 10. Guilt
____ 11. Happiness
____ 12. Loneliness
____ 13. Anxiety
____ 14. Caring
____ 15. Disgust
____ 16. Regret
____ 17. Contentment
____ 18. Unhappiness
____ 19. Pride
____ 20. Nervousness
____ 21. Fondness
____ 22. Rage
____ 23. Embarrassment
____ 24. Depression

Appendix C- Study 1 Norm Measures

Using the scale below, please indicate the extent to which you believe it is FUNCTIONAL or ADAPTIVE to feel each emotion.

Never Functional	--	--	Sometimes Functional	--	--	Always Functional
1	2	3	4	5	6	7

____ 1. Shame
____ 2. Joy
____ 3. Fear
____ 4. Affection
____ 5. Anger
____ 6. Sadness
____ 7. Worry
____ 8. Love
____ 9. Irritation
____ 10. Guilt
____ 11. Happiness
____ 12. Loneliness
____ 13. Anxiety
____ 14. Caring
____ 15. Disgust
____ 16. Regret
____ 17. Contentment
____ 18. Unhappiness
____ 19. Pride
____ 20. Nervousness
____ 21. Fondness
____ 22. Rage
____ 23. Embarrassment
____ 24. Depression

Appendix C- Study 1 Norm Measures

Using the scale below, please indicate how much you think the IDEAL PERSON leading the IDEAL LIFE would feel each emotion.

Never	--	--	Sometimes	--	--	Always
1	2	3	4	5	6	7

____ 1. Shame
____ 2. Joy
____ 3. Fear
____ 4. Affection
____ 5. Anger
____ 6. Sadness
____ 7. Worry
____ 8. Love
____ 9. Irritation
____ 10. Guilt
____ 11. Happiness
____ 12. Loneliness
____ 13. Anxiety
____ 14. Caring
____ 15. Disgust
____ 16. Regret
____ 17. Contentment
____ 18. Unhappiness
____ 19. Pride
____ 20. Nervousness
____ 21. Fondness
____ 22. Rage
____ 23. Embarrassment
____ 24. Depression

Appendix D-Norms of experiencing emotion- Study 2
Norm measure 1
Using the scale below, rate these emotions for APPROPRIATE you think it is to feel each emotion.

Always Inappropriate			Sometimes Appropriate			Always Appropriate
1	2	3	4	5	6	7

____ 1. anxious
____ 2. calm
____ 3. sad
____ 4. happy
____ 5. worried
____ 6. guilty
____ 7. irritated
____ 8. proud
____ 9. joyful
____ 10. sociable
____ 11. excited
____ 12. bored
____ 13. pleasant
____ 14. unpleasant

Appendix D-Norms of experiencing emotion- Study 2
Using the scale below, rate these emotions for DESIRABLE you think it is to feel each emotion.

Always undesirable			Sometimes desirable			Always desirable
1	2	3	4	5	6	7

____ 1. anxious
____ 2. calm
____ 3. sad
____ 4. happy
____ 5. worried
____ 6. guilty
____ 7. irritated
____ 8. proud
____ 9. joyful
____ 10. sociable
____ 11. excited
____ 12. bored
____ 13. pleasant
____ 14. unpleasant

Appendix D-Norms of experiencing emotion- Study 2

Using the scale below, rate these emotions for FUNCTIONAL or ADAPTIVE you think it is to feel each emotion.

Always dysfunctional or adaptive			Sometimes Functional or adaptive			Always Functional or adaptive
1	2	3	4	5	6	7

____ 1. anxious
____ 2. calm
____ 3. sad
____ 4. happy
____ 5. worried
____ 6. guilty
____ 7. irritated
____ 8. proud
____ 9. joyful
____ 10. sociable
____ 11. excited
____ 12. bored
____ 13. pleasant
____ 14. unpleasant

Appendix D-Norms of experiencing emotion- Study 2

Using the scale below, rate these emotions for how much you think the IDEAL PERSON leading the IDEAL LIFE would feel each emotion.

Never			Sometimes			Always or almost always
1	2	3	4	5	6	7

____ 1. anxious
____ 2. calm
____ 3. sad
____ 4. happy
____ 5. worried
____ 6. guilty
____ 7. irritated
____ 8. proud
____ 9. joyful
____ 10. sociable
____ 11. excited
____ 12. bored
____ 13. pleasant
____ 14. unpleasant

Appendix E
Life Satisfaction Measure

Below are five statements that you may agree or disagree with. Using the scale below, please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

Disagree strongly	Disagree	Disagree slightly	Neither agree nor disagree	Agree slightly	Agree	Agree strongly
1	2	3	4	5	6	7

____ 1. In most ways my life is close to the ideal.

____ 2. The conditions of my life are excellent.

____ 3. I am satisfied with my life.

____ 4. So far I have gotten the things I want in life.

____ 5. If I could live my life over, I would change almost nothing.

Appendix F
Life Satisfaction Norm

Using the scale below, please write a number next to each statement to indicate the extent to which the IDEAL PERSON leading the IDEAL LIFE would agree or disagree with that statement.

Disagree strongly	Disagree	Disagree slightly	Neither agree nor disagree	Agree slightly	Agree	Agree strongly
1	2	3	4	5	6	7

____ 1. In most ways my life is close to the ideal.

____ 2. The conditions of my life are excellent.

____ 3. I am satisfied with my life.

____ 4. So far I have gotten the things I want in life.

____ 5. If I could live my life over, I would change almost nothing.

Appendix G
Personality Scale

The following phrases describe people's behaviors. Please use the scale below to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. Please use the scale below.

Very Inaccurate	Moderately Inaccurate	Neither	Moderately Accurate	Very Accurate
1	2	3	4	5

____ 1. Am often down in the dumps.
____ 2. Feel comfortable around people.
____ 3. Often feel blue.
____ 4. Make friends easily.
____ 5. Dislike myself.
____ 6. Am skilled in handling social situations.
____ 7. Panic easily.
____ 8. Am the life of the party.
____ 9. Am not easily bothered by things.
____ 10. Know how to captivate people.
____ 11. Have little to say.
____ 12. Rarely get irritated.
____ 13. Keep in the background.
____ 14. Have frequent mood swings.
____ 15. Would describe my experiences as somewhat dull.
____ 16. Don't like to draw attention to myself.
____ 17. Feel comfortable with myself.
____ 18. Seldom feel blue.

____ 19. Don't talk a lot.

____ 20. Am very pleased with myself.

Appendix H
Demographics Questionnaire

Below we ask background and medical history questions. Please answer these questions honestly and openly. Remember your answers are confidential and for important research purposes.

Please indicate your sex: female male

What is your religion? (Please circle your response)

Protestant Catholic Jewish Hinduism

Buddhism other none

What is your ethnicity? (please circle your response)

Caucasian Black/African American Latino/a or Hispanic

Asian/Asian American Native Indian

Other (please specify) _____

If applicable, what year are you in school? (Please circle your response)

high school college first-year college second-year

college third-year college fourth-year college fifth-year or more

graduate student other (indicate) _____

Marital status (please circle your response):

Single engaged married divorced

Widowed other

What is your AGE? (write here) _____

What is your MAJOR (if applicable)? _____

If you are fluent in another language besides English, please list the language(s) here:

1.

2.
3.
4.

Appendix I
Experience Sampling Emotion Questionnaire
The following questions will be asked on the Palm pilot computer during the experience sampling week using the below scale. Students will be asked to report their emotions "just before they were signaled."

Not at all	Slightly	Moderately	Strongly	Maximum Intensity

1) How calm were you feeling?
2) How sad were you feeling?
3) How anxious were you feeling?
4) How happy were you feeling?
5) How joyful were you feeling?
6) How guilty were you feeling?
7) How worried were you feeling?
8) How proud were you feeling?
9) How irritated were you feeling?
10) How sociable were you feeling?
11) How excited were you feeling?
12) How bored were you feeling?
13) How pleasant were you feeling*?

(*Pleasant and unpleasant emotion will be asked on a sliding continuum, where one extreme of the continuum is feeling pleasant and the other extreme is feeling unpleasant.

i.e. Unpleasant----------||----------Pleasant)

Appendix J
Recall Emotion Measure

During the experience sampling (the days you were beeped with the palm pilot) how often did you experience each of the following emotions. Please indicate what **percent of the time** you were feeling each emotion, ranging from 0% to 100%. Your numbers do not need to add up to 100% since you may have felt more than one emotion at a time. Even if you were only feeling it very slightly or at a very low level of intensity please rate the emotion.

_____ 1. anxious
_____ 2. calm
_____ 3. sad
_____ 4. happy
_____ 5. worried
_____ 6. guilty
_____ 7. irritated
_____ 8. proud
_____ 9. joyful
_____ 10. sociable
_____ 11. excited
_____ 12. bored
_____ 13. pleasant
_____ 14. unpleasant

Appendix K
Recalled Life Satisfaction

Below are five statements **asking about the week you carried the palm pilot** that you may agree or disagree with. Using the scale below, please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

Disagree strongly	Disagree	Disagree slightly	Neither agree nor disagree	Agree slightly	Agree	Agree strongly
1	2	3	4	5	6	7

____ 1. In most ways my life was close to the ideal the week I carried the palm pilot.

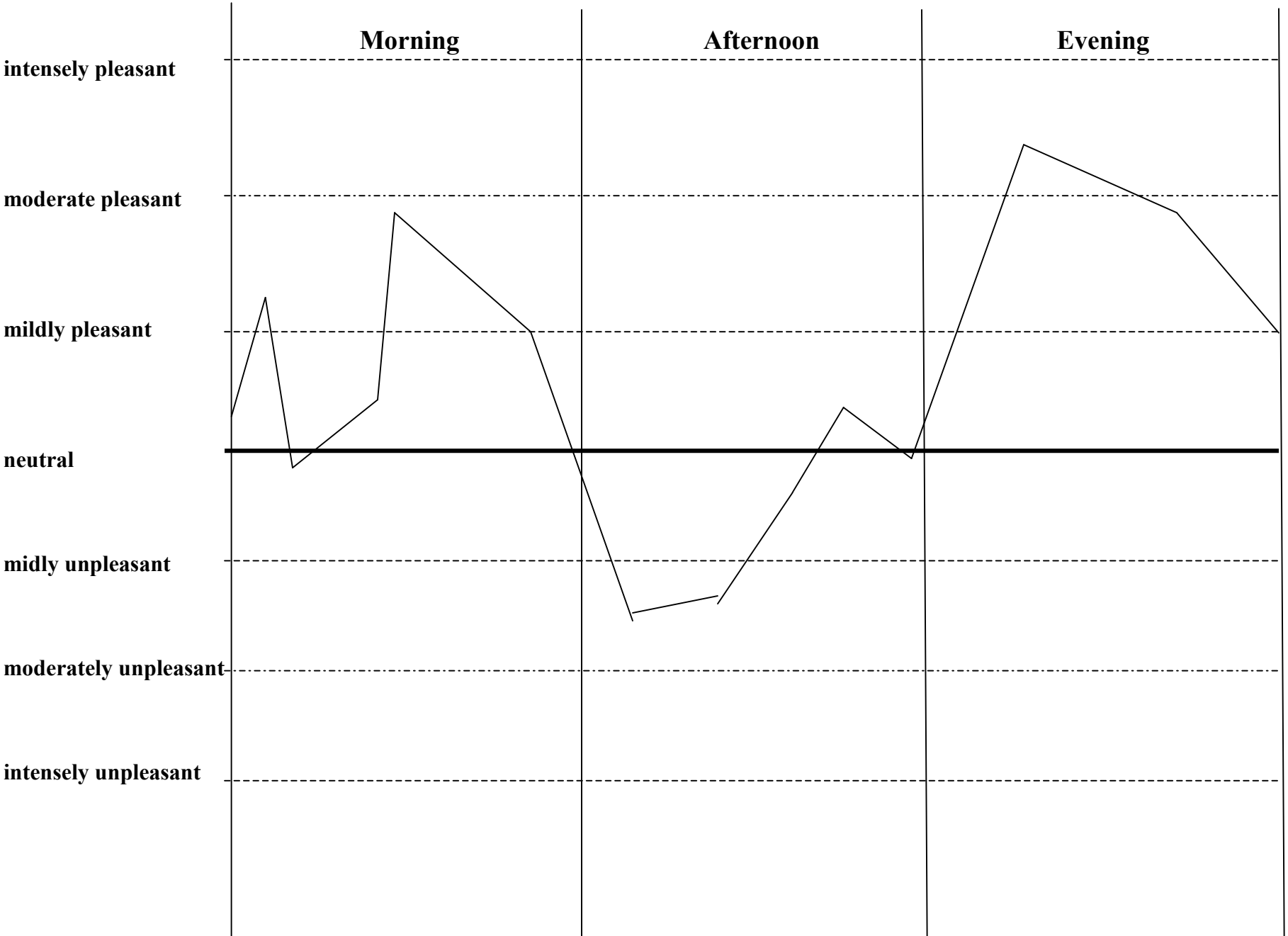
____ 2. The conditions of my life were excellent the week I carried the palm pilot.

____ 3. I was satisfied with my life the week I carried the palm pilot.

____ 4. I have got the things I wanted in life the week I carried the palm pilot.

____ 5. If I could live the week I carried the palm pilot over, I would change almost nothing.

Appendix L
Graphing Emotional Variability
Below is an example of the emotions one might experience over a day.



Using the sheet provided below please graph **<u>your</u>** emotions during the week you carried the palm pilot computer.

DAY X

	Morning	Afternoon	Evening
intensely pleasant			
moderate pleasant			
mildly pleasant			
neutral			
midly unpleasant			
moderately unpleasant			
intensely unpleasant			

Appendix M
Informed Consent

STATEMENT OF CONSENT

This study concerns personality and daily moods and will take place over the next 21 days. Although the overall amount of time involved in this study will be about two hours, you will need to make 5 visits to the laboratory. Most of these visits will be extremely brief, and we will do our best to arrange for convenient times for you.

- Day 1: Complete questionnaire. Receive palm pilot, learn basic features of the palm pilot, and begin 7-day mood study (approximately 1 hour)
- Day 3: Mid-week data retrieval from palm pilot. Complete questionnaire (approximately 10 minutes)
- Day 7: Return palm pilot, complete brief questionnaire. (approximately 10 minutes)
- Day 14: Complete brief questionnaire. (approximately 10 minutes)
- Day 21: Complete brief questionnaire. (approximately 30 minutes)

Today, you will be asked to answer some questions regarding how satisfied you are with your life and how you feel about yourself. You will answer questions about you attitudes about specific emotions, as well.

Today, you will also learn how to use the palm pilot, and you will receive a palm pilot to carry around for the following 7 days. During the next 7 days, you will carry the palm pilot wherever you go, and it will sound an alarm at random 7 times a day. When the alarm goes off, you will answer a brief questionnaire on the palm pilot about how you feel and what you are doing. We have tried to make this as convenient for you as possible; therefore each survey is very brief and takes about 30 seconds to complete.

You will be asked to stop by the laboratory several times throughout the course of this study. Each visit will be very brief (about 10 minutes) and the last one will be about 30 minutes. In these sessions, you will answer some very short questionnaires about your experiences carrying the palm pilot.

Upon completion, you will receive credit for your time. As an added incentive, you will also be entered into a drawing with the other participants for a $200 gift certificate. The more you participate, the more tickets you will receive to enter into the drawing. Your participation is completely voluntary. And, of course, you are free to discontinue the study at any time at which point you will receive partial credits and tickets for your participation.

There is no known harm involved in participating in this study. So as to ensure strict confidentiality, your name will not be tied to any of your responses or to the palm pilot. Instead, you will be assigned a subject number. This consent form will be kept separate from your data. Data will be linked by subject identification number, and only the investigators will have access to files that link the data.

If you have any questions now or anytime during the course of this study, please do not hesitate to ask. Please contact Amanda Hiles (a.r.hiles@tcu.edu, Room 155 Winton-Scott Hall) or Professor Christie Scollon (c.scollon@tcu.edu, Room 362 Winton-Scott Hall). Or you may contact us by phone at x6424. If you have any questions about the rights of participants, please contact Dr. Don Dansereau (x7410), Chair of the Psychology Human Subjects Committee, Dr. Timothy Hubbard (x6417), Chair of the TCU Committee on the

Safeguards of Human Subjects, or Jan Fox (x7515), TCU Coordinator of Research and Sponsored Projects.

I acknowledge that I am participating in this study of my own free will. I understand that I may refuse to participate or stop participating at any time. If I wish, I will be given a copy of this consent form.

_____

Participant's Name (PLEASE PRINT) Participant's TCU Student ID#

_____

Participant's Signature Date

VITA

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Publications

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ABSTRACT

THE RELATION OF NORMS AND
MEMORY FOR EMOTION

by Amanda Roberta Hiles M.S., 2006
Department of Psychology
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Thesis Advisor: Christie Napa Scollon, Professor of Psychology

The SWB measures have been shown to converge and diverge in interesting ways. Specifically, people memory for emotion differs from their momentary experience of emotions. Systematic factors such as norms guide the reconstruction of memories for past emotions. Several studies have shown that norms play a role in shaping reports of emotions. However, these studies have only used global and retrospective reports of emotion, or have not measured norms directly. The current study directly examined the level at which norms operate on emotions current mood and recalled emotions using the experience sampling method. Results indicate that norms operate on recalled emotion and not momentary emotion. Further, the correlation between recalled emotion and norms is stronger for pleasant than unpleasant emotion.