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Effects of Intensive Mobile Happiness Reporting in Daily Life

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Abstract

Does intensive focus on happiness change the naturalistic experience of happiness over time? In a 2-week text-messaging experiment, young adult participants ($n = 162$) reported their current happiness 1, 3, or 6 times daily. Examination of temporal changes in momentary happiness over time showed no group differences, suggesting little evidence for reactivity overall. However, the effects were moderated by current depressive symptoms and neuroticism and to a lesser extent by self-esteem (trend only) and not by trait happiness. Individuals higher in depressive symptoms or neuroticism showed decreased momentary happiness over time with more frequent reporting, whereas individuals lower in depressive symptoms or neuroticism showed the opposite pattern with increased momentary happiness over time with more frequent reporting. Effects for self-esteem were similar but did not reach statistical significance. Findings suggest that intensive happiness reporting through mobile technology may be aversive or beneficial depending upon the negative emotional disposition of individuals.

Keywords

happiness, emotion, experience sampling method, text messaging, short messaging service (SMS)

The pursuit of happiness appears more central to people's lives than ever before. With the human potential movement of the 1960s and the recent establishment of positive psychology as a scientific field (Csikszentmihalyi, 1990; Diener, 1984; Fredrickson, 2001; Maslow, 1968; Ryan & Deci, 1985; Ryff & Singer, 1999; Seligman, 2002), there are now countless articles, books, workshops, and online courses to service the booming happiness industry (Kashdan, 2010). In his popular coauthored book *The Art of Happiness,* the present day Dalai Lama reinforces these pursuits by reminding readers that "the very purpose of our existence is to seek happiness" (Dalai Lama & Cutler, 1998, p. 16).

Technology has also caught the happiness train. Tens of thousands of people are now using mobile applications to report and keep track of their happiness intensively over time. Some of the more popular applications include *Mappiness* (www.mappiness.org.uk), a U.K.-based iPhone application launched in 2010 from the London School of Economics that currently has over 43,000 users and counting; *Track Your Happiness* (www.trackyourhappiness.org), a U.S.-based iPhone application developed at Harvard, also launched in 2010, with over 15,000 users; and several other commercial mobile applications available on iTunes including *RUHappy* (http://ruhap.com/), *Happiness for iPhone* (http://itunes.apple.com/app/happiness-for-iphone/id406510914), and *Mood Barometer* (http://itunes.apple.com/us/app/mood-barometer/id366293015?mt=8; user numbers unknown). These applications are downloaded to personal mobile phones and signal people semi-randomly during their daily lives to report their current feelings of happiness. On average, people receive about 3 signals/day, and the length of sampling lasts from a couple of weeks to indefinitely depending on the application and user preference. Respondents receive personalized happiness reports sometimes in exchange for allowing their data to be used for scientific research (e.g., Mappiness and Track Your Happiness).

Research has already established the scientific benefits of intensive real-time happiness tracking (see Kurtz & Lyubomirsky, 2012). As with other forms of real-time measurement (computerized experience sampling, daily diaries), these techniques minimize retrospective memory biases and provide greater resolution into the dynamics of happiness as it unfolds over time in daily life (Mehl & Conner, 2012). Tracking happiness in daily life has allowed researchers to identify the qualitative differences between real-time versus remembered happiness (e.g., Kahneman, 2010; Kahneman & Riis, 2005; Oishi, 2002; Wirtz, Kruger, Scollon, & Diener, 2003), the conditions and activities of daily life that foster greater happiness (e.g., being with others, Csikszentmihalyi & Hunter, 2003; being engaged at work, Csikszentmihalyi, 1990; less mind

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wandering, Killingsworth & Gilbert, 2010), and the effects of real-time happiness on psychological and physiological processes (e.g., greater interpersonal and personal success, Lyubomirsky, King, & Diener, 2005; improved immune system function, Cohen, Alper, Doyle, Treanor, & Turner, 2006; improvements in heart rate variability, Kok & Fredrickson, 2010; and greater longevity, Carstensen et al., 2011).

While the scientific advantages of intensive real-time happiness assessment are well established, the benefits to individuals actually tracking their happiness are unknown. What are the psychological consequences of intensive, intermittent focus on happiness in daily life? Does intensive reflection benefit people, or does it potentially backfire leading to less happiness over time? Research has not yet addressed this question directly with regard to mobile assessments, although indirect evidence points to either positive or negative effects of frequent happiness tracking. In terms of positive effects, happiness tracking may make people more aware of the contexts and situations in which they feel happy. This awareness could lead them to do more of what they love (and less of what they loathe), leading to greater happiness. Happiness tracking may also heighten the salience of positive emotions, which could benefit people by ''broadening-and-building'' their thought–action repertoire (Fredrickson, 2001; Tugade & O'Haire, 2011) and fostering resilience (Tugade & Fredrickson, 2004). Given evidence that even small changes in happiness can benefit individuals both psychologically (Fredrickson, 2009) and physiologically (Steptoe & Wardle, 2005), we might expect that paying greater attention to happiness will result in greater happiness over time. Indeed, a recent 2-week experience-sampling experiment found beneficial effects of reporting happiness-boosting behaviors in daily life (e.g., laughing, doing a good deed) versus reporting neutral behaviors (e.g., walking to class, answering email) (Tugade & O'Haire, 2011). Although attention to happy behaviors did not improve happiness per se (as measured by momentary positive affect), it did result in greater cognitive flexibility—a core component of the broaden-and-build theory of positive emotions.

Yet, other evidence points to negative effects of frequent happiness tracking. Happiness tracking requires repeatedly redirecting attention to the self, which may result in greater self-focus. There is an extensive literature in psychology pointing to the potential harms of self-focused attention with both correlational and experimental research showing that greater attention to the self is associated with negative affect (e.g., Ingram, 1990; Mor et al., 2010; Mor & Windquist, 2002). By contrast, less self-focused attention typically corresponds with positive affect (e.g., Green, Sedikides, Saltzberg, Wood, & Forzano, 2003). Thus, repeated introspection through mobile happiness tracking could evoke a self-aware state, or regularly induce meta-awareness (Schooler & Mauss, 2010), which could lead to less happiness over time.

Negative effects are also possible as people discover that they are not as happy as they thought they might be (or want to be). Daily emotional experiences—including positive emotions—are often less intense than people anticipate or remember (Miron-Shatz, Stone, & Kahneman, 2009; Morewedge, Gilbert, & Wilson, 2005; Wirtz, Kruger, Scollon, & Diener, 2003). As a result, expectations about happiness may not match up with actual happiness. When tracking their happiness, people may become aware of their less-than-expected happy state, which could be distressing, resulting in impaired happiness over time as tracking continues.

To date, there is only minimal and mixed direct evidence for potential disruptive effects of happiness tracking. Surprisingly, experience sampling research has not yet addressed whether tracking emotions in daily life is potentially reactive (for a review of measurement reactivity, see Barta, Tennen, & Litt, 2012). There has been some laboratory research that speaks to this issue but the results are inconsistent. For example, in a chapter by Schooler, Ariely, and Loewenstein (2003), they reported preliminary evidence showing that the act of monitoring pleasure (a core component of happiness) impaired the experience of pleasure in short-term laboratory tasks: People who continuously rated their enjoyment while listening to music were less happy following the experience compared to people who did not rate their enjoyment. Yet such reactivity effects have not been replicated. For example, Mauss, Levenson, McCarter, Wilhelm, and Gross (2005) found no differences in either self-reported amusement, facial expressions, or physiology between people who continuously rated their amusement while watching a short film versus people who simply watched the film. Thus, even in tightly controlled circumstances, frequent self-monitoring of positive feelings sometimes is, and sometimes is not, disruptive. Moreover, prior laboratory research does not entirely capture what happens during mobile happiness tracking. With mobile tracking, happiness is monitored less frequently over a longer period of time (days and weeks) rather than minutes; attention is only briefly, not continuously, directed to feelings; and the environment is far less controlled because reports are made in the real-world as people respond to the conditions of daily life.

Thus, the goal of this study was to experimentally test the effects of mobile-phone-based self-monitoring of happiness on the experience of happiness over time in daily life. Using a text-messaging-based mobile tracking system, participants were randomly assigned to report their current levels of happiness either 1, 3, or 6 times daily for 13 days through their personal mobile phones. Changes in momentary happiness over time were assessed and compared across conditions to determine whether frequency of reporting changed the experience of happiness over time.

The experiment also was designed to examine individual differences in the effects of intensive reporting of happiness in daily life. The potential effects of happiness tracking may depend on individual differences related to emotion and the self-concept. Thus, we tested four individual difference factors—depressive symptoms, neuroticism, trait happiness, and self-esteem. These factors are known to influence what people feel, and they may also affect how people respond to frequent introspection on happiness. For example, heightened self-focus is known to be particularly aversive among those with depression

(Mor et al., 2010; Sakamoto, 1998), higher neuroticism (Field, Joudy, & Hart, 2010), and lower self-esteem (Field, Joudy, & Hart, 2010; Phillips & Silva, 2005). Thus, if mobile happiness tracking increases self-focus, then individuals higher in depression and neuroticism and lower in self-esteem should show declines in happiness with more frequent happiness reporting. Frequent self-reporting of happiness may also be distressing particularly to people with emotional vulnerabilities (i.e., depression or neuroticism). For these people, introspection on happiness may serve as a frequent reminder of how unhappy they are, which, when considering their tendencies toward rumination (Nolen-Hoeksema, 2000; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), could make them feel worse over time. Thus, it is possible that individuals higher in depression and neuroticism may be most strongly and negatively affected by more frequent happiness reporting. Lastly, trait happiness could also be a moderator. For dispositionally happier people, introspection may be a pleasant experience, potentially resulting in increases in happiness over time with more frequent happiness reporting.

Method and Procedure

Participants were 162 university students (41% men), 17–30 years old (M = 19.9, SD = 2.4), who self-identified as Caucasian (81%), Asian (10%), Indian (4%), Māori or Pacific Islander (3%), or another ethnicity (3%).[1] Participants were recruited through the Psychology Department's experimental participation program and remunerated with partial course credit and a mobile phone voucher to cover the costs of texting.

In an initial laboratory session, participants individually completed informed consent and computerized measures of *demographics* (gender, age, and ethnicity), *current depressive symptoms*: 20-item Center for Epidemiologic Studies Depression scale ([CES-D] Radloff, 1977; α = .89), *neuroticism*: 12-item scale from the NEO-Five-Factor Inventory ([NEUR] Costa & McCrae, 1985; α = .86), *trait happiness*: 4-item Subjective Happiness scale ([SHS] Lyubomirsky & Lepper, 1999; α = .85) and *self-esteem*: 10-item Rosenberg Self-Esteem scale ([RSES] Rosenberg, 1965; α = .88). They also reported the number of text messages they received typically per day as a measure of *texting experience*.

Next, they received training for the texting procedure, which began the next day. Participants received 1, 3, or 6 text messages each day for 13 days based on their randomly assigned condition. Each text contained three questions to tap the hedonic and cognitive aspects of happiness. The questions were presented in a format suitable for text messaging: "RIGHT NOW: How happy do U feel? R U enjoying what U R doing? How positive do U feel about life? 1 = not at all … 9 = extremely." Participants responded by sending three numeric answers in a single reply text (e.g., "536"), which were averaged for analysis (α = .66; Nezlek, 2012). The three questions were always presented in the same order. Texts were delivered to each participant's personal mobile phone semi-randomly 1, 3, or 6 times daily between 9 a.m. and 9 p.m. on weekdays and between 12 p.m. and 10 p.m. on weekends using www.message-media.com. Participants were told to reply to the texts "as soon as they could" after receiving them. After 13 days of texting, participants returned to the laboratory the next day for debriefing and remuneration.

Results

Texting Response Rates and Timing Statistics

All participants reported having some degree of experience with texting, M (SD)= 26 (28) texts/day; range = 1–150, which did not differ by experimental condition (p = .77) or by any of the individual difference variables (ps .10–.92). Participants replied to 96% of texts, SD = 5%; range = 77%–100%; excluding duplicates and next day texts, which also did not vary by condition (p = .09) or by the individual difference variables (ps .32–.74). The median text reply time delay was 2 minutes, M (SD) = 16(37), range <1 minute to 9 hours. Participants receiving 1 text per day took longer to respond (median [Mdn] = 3 min) than those receiving 3 or 6 texts per day, Mdn = 2 min; $F(2,159)$ = 5.184, p = .01. Median reply times did not differ significantly by the individual difference variables (ps .07–.67).

Main Effects of Mobile Happiness Reporting

Figure 1 shows the changes in momentary happiness over time for each of the three happiness reporting groups. A visual examination suggested no group differences in changes in happiness. The box plot in the inset of Figure 1 also suggested no group differences in the linear trends over time. Moreover, inferential tests using a series of multilevel models confirmed no main effect of linear time, G10 $b(SE)$ = .006(.006), p = .36; no main effect of group, coded 0, 1, 2; G01 $b(SE)$ = .083(.098), p = .40; and no critical Time × Group interaction, G11 $b(SE)$ = −.008(.008), p = .31; HLM v 6.08; Raudenbush, Bryk, & Congdon, 2004. Follow-up tests using dummy coding with 1 text per day as the reference group also revealed no significant group differences in changes in momentary happiness over time between the 1 versus 3 texts/day group, G11 $b(SE)$ = .005(.016), p = .78, or between the 1 versus 6 texts/day group, G12 $b(SE)$ = −.016(.016), p = .33. The effects remained the same when excluding the three outliers identified in the Figure 1 box plot. Effects also remained nonsignificant when analyzing the three happiness items separately. These null effects occurred despite the design being highly powered (.94) to detect a modest linear trend difference of b = .041 happiness points per day and adequately powered (.80) to detect an even smaller linear trend difference of b = .033 points per day (Optimal Design; Raudenbush, Spybrook, Congdon, Liu, & Martinez, 2009). Thus, the decision to retain the null hypothesis is not likely due to the design of the study.

Individual Differences in the Effects of Mobile Happiness Reporting

While no overall group differences were found, changes in happiness as a function of reporting group were moderated by

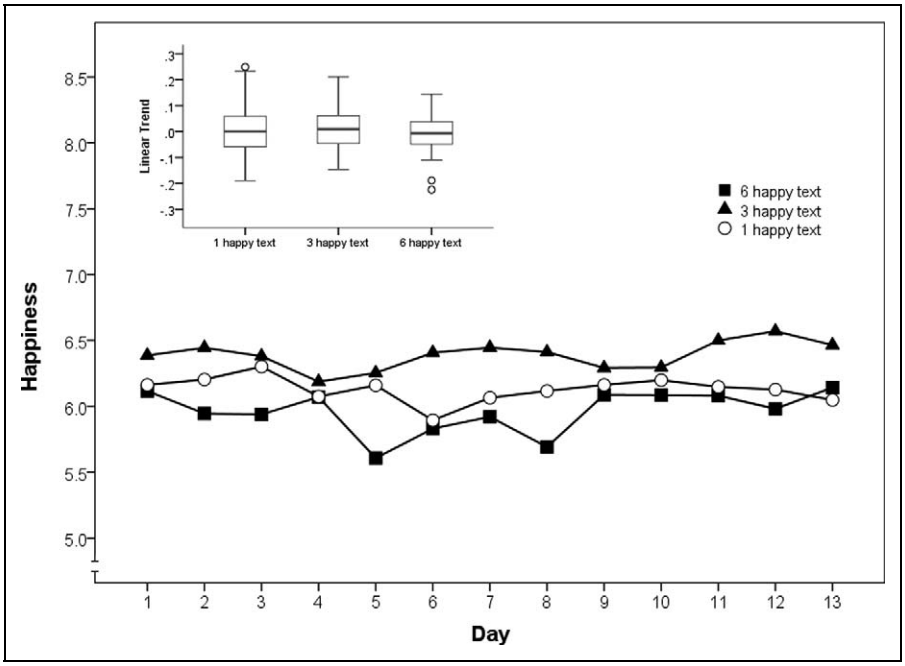

Figure 1. Changes in daily averaged momentary happiness ratings for each experimental group. The inset graph shows the box plots of the linear trends for individuals in the three experimental groups. The horizontal lines represent the medians; the boxes represent the interquartile range (IQR) between the first and third quartiles reflecting 50% of cases; the vertical whisker lines represent upper and lower acceptable range of trend values ($\pm$ 1.5 $\times$ IQR). The three cases outside these whisker lines indicate outliers. Graph formatting based on recommendations by Lane and Sándor (2009).

depressive symptoms, Time $\times$ Group $\times$ CES-D G13 $b(SE) = -.0024(.0009)$, $p = .011$; and, separately, by neuroticism, Time $\times$ Group $\times$ Neuroticism G13 $b(SE) = -.035(.013)$, $p = .010$. Using dummy codes for greater resolution, depressive symptoms was a trend for moderating the effect of responding to 1 versus 3 texts per day, Time $\times$ Dummy1 $\times$ CES-D G14 $b(SE) = -.0033(.0018)$, $p = .072$; and significantly moderated the effect of responding to 1 versus 6 texts per day, Time $\times$ Dummy2 $\times$ CES-D G15 $b(SE) = -.0048(.0019)$, $p = .008$. Neuroticism significantly moderated the effect of responding to both 1 versus 3 texts per day, G14 $b(SE) = -.074(.026)$, $p = .006$; and to 1 versus 6 texts per day, G15 $b(SE) = -.074(.027)$, $p = .008$.

These patterns of moderation are displayed in Figure 2. As shown in the top panel (Figure 2A), the effect of reporting frequency on changes in momentary happiness was different among those lower and higher in depressive symptoms. Although none of the simple slopes reached statistical significance, the patterns of changes for individuals in the 1, 3, and 6 texts per day groups were nearly reversed as a function of depressive symptoms. Increases in the frequency of reporting corresponded with increases in happiness trajectories among those lower in depression (Figure 2A, left) but corresponded with decreases in happiness trajectories among those higher in depression (Figure 2B, right). Depressive symptoms accounted for 7.1% of the variance in the changes in happiness as a function of reporting group. This percentage reflects a Cohen's d of .55 (Ellis, 2009), which is considered a medium effect size (Cohen, 1988).

Patterns for neuroticism were similar and stronger, as shown in the bottom panel (Figure 2B). Again, the slope patterns were reversed as a function of neuroticism. Individuals lower in neuroticism generally became happier with more frequent reporting (Figure 2B, left), whereas individuals higher in neuroticism became less happy with more frequent reporting (Figure 2A- right). Here, the effect size was nearly double that of depressive symptoms, with neuroticism accounting for 12.8% of the variance in the changes in happiness as a function of reporting group (Cohen's $d = .77$, a "large" effect). Moreover, for neuroticism, two of the six simple slopes were significant. First, as shown in Figure 2B (left), among those lower in neuroticism, reporting happiness three times a day was associated with significant increases in happiness over time, simple slope $b(SE) = .056(.011)$, $p = .02$. Interestingly, doubling the number of reports to six times per day yielded no significant increases in happiness, simple slope $b(SE) = .011(.013)$, $p = .44$. Second, as shown in Figure 2B (right), surprising effects were shown among people higher in neuroticism who reported their happiness once per day. Once-daily reporting significantly increased their happiness over time, simple slope $b(SE) = .040(.015)$, $p = .01.2$

None of the other moderators were significant. Self-esteem exhibited patterns similar to depressive symptoms and neuroticism but did not reach statistical significance, linear results: Time $\times$ Group $\times$ RSES G13 $b(SE) = .022(.014)$, $p = .11$; dummy results: Time $\times$ Dummy1 $\times$ RSES G14 $b(SE) = .048(.026)$, $p = .07$; Time $\times$ Dummy2 $\times$ RSES G15 $b(SE) = .045(.027)$, $p = .09$. Trait happiness was not a significant

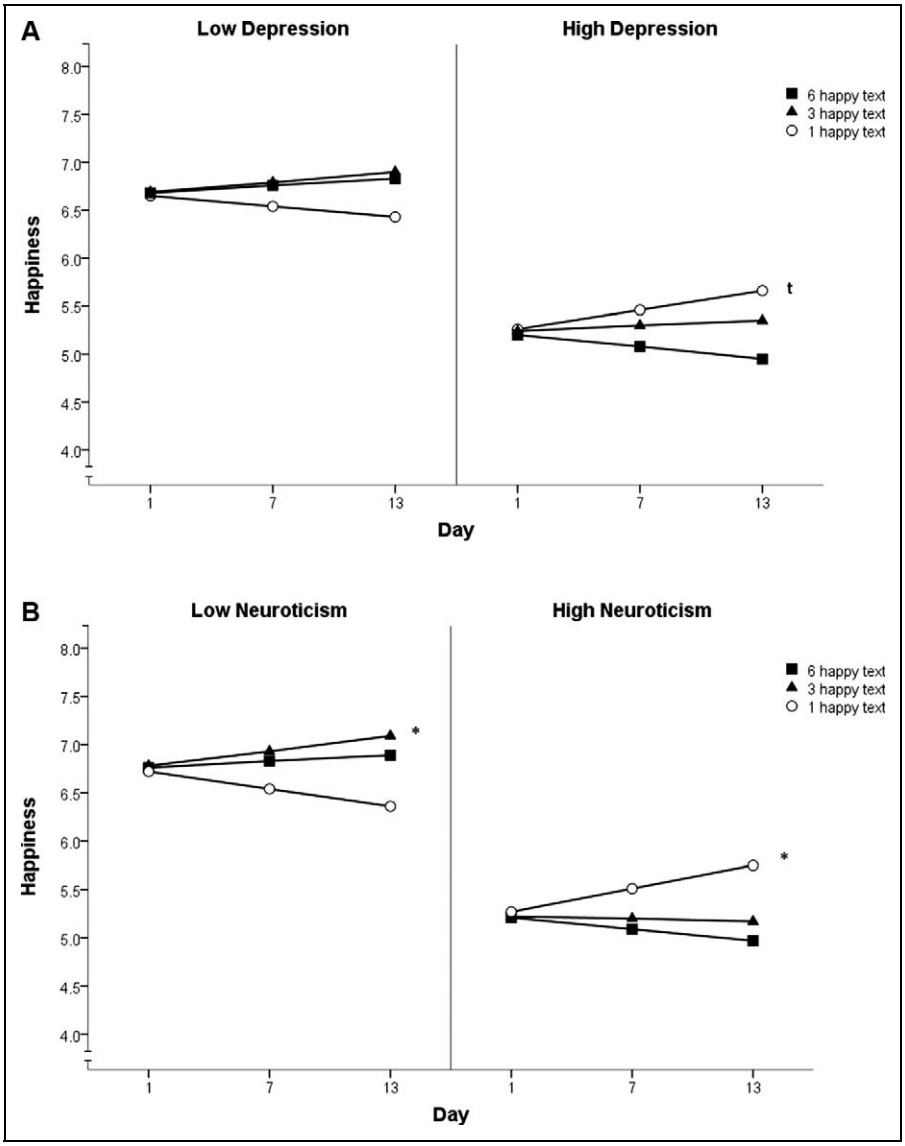

Figure 2. The top panel (A) shows the changes in happiness over time for the three experimental groups among those low (−1 *SD*) and high (+1 *SD*) in current depressive symptoms (Center for Epidemiologic Studies Depression scale [CES-D] scores). The bottom panel (B) shows similar changes among those low (−1 *SD*) and high (+1 *SD*) in neuroticism. All values were estimated from multilevel regression models. Significant simple slopes are noted: *t* (trend), $p < .10$; * $p < .05$.

moderator, linear results: Time × Group × SHS G13 $b(SE) = .008(.008)$, $p = .27$; dummy results: Time × Dummy1 × SHS G14 $b(SE) = .018(.014)$, $p = .20$; Time × Dummy2 × SHS G15 $b(SE) = .016(.015)$, $p = .29$. And experience with texting was not a significant moderator,[3] linear results: Time × Group × Texting Experience G13 $b(SE) = -.008(.0080)$, $p = .34$; dummy results: Time × Dummy1 × Texting Experience G14 $b(SE) = -.002(.001)$, $p = .21$; Time × Dummy2 × Texting Experience G15 $b(SE) = .003(.002)$, $p = .10$.

Discussion

Was intensive mobile self-reporting of happiness detrimental to happiness? Not when the sample was examined as a whole. In fact, we found no evidence for unqualified reactivity in the intensive mobile reporting of happiness. Young adults randomly assigned to report their happiness 3 or 6 times per day showed similar patterns of happiness over the 13 days compared to those who only reported their happiness once per day. However, we did find evidence for qualified reactivity. People at the extremes of negative affectivity—those either low or high in depression or neuroticism—were affected by the frequency of reporting. As happiness reporting frequency increased from 1 to 3 to 6 per day, young adults lower in depressive symptoms or neuroticism showed increasing happiness trajectories, whereas those higher in depressive symptoms or neuroticism showed decreasing happiness trajectories.

There could be a number of mechanisms underlying these patterns. First, it is unlikely that changes are simply due to the act of texting. Students in this sample, including those high in

depressive symptoms or neuroticism, were experienced with text messaging, replied quickly to the texts, and showed excellent response rates, suggesting that texting was fairly natural and not particularly burdensome. Moreover, participants' self-reported experience with texting was not a significant predictor of changes in happiness as a function of reporting group. Instead, the pattern of results—which were strongest for depression and neuroticism, weaker for self-esteem, and not at all significant for trait happiness—suggested that effects were driven more by factors related to negative emotional vulnerabilities and less by factors linked to the self-concept or to trait positivity. Such factors could include self-focus mechanisms, distress over daily mood, rumination tendencies, or some combination thereof. Frequent texts about happiness likely evoked attention to the self, which previous research suggests can impair mood among those higher in depression, neuroticism, and lower in self-esteem (Field, Joudy, & Hart, 2010; Mor et al., 2010; Sakamoto, 1998; Phillips & Silva, 2005). Moreover, texting about happiness seemed to be particularly distressing among those with more negative emotional tendencies (depression and neuroticism). For these individuals, frequent happiness texts may have drawn attention to their typically unpleasant emotional state, thus bearing the potential of perpetuating a downward spiral of satisfaction. For people without such vulnerability, frequent texts may have evoked attention to their typically positive states, enabling them to capitalize on the benefits of their positive emotions, thus creating a potential for an upward spiral of satisfaction. Intensive self-reporting may have also stimulated rumination processes among those higher in depression and neuroticism (Nolen-Hoeksema et al., 2008) leading to more negative changes in happiness. Lastly, any mechanism would need to explain why emotionally negative participants got happier over time when asked to report their happiness once a day. It is possible that a single randomly occurring text simply did not provide enough feedback to vulnerable individuals that they were unhappy. This lack of negative feedback could have had a contrast effect of increasing their happiness over time. This effect warrants replication.

There were several limitations of the study. First unlike some happiness-tracking applications (e.g., Mappiness), we did not provide feedback to participants about their happiness levels or the conditions and circumstances in which they are happiest. Instead, we tried to isolate the effects of tracking happiness, which is core to all mobile happiness applications. Explicit feedback may change the nature of the observed effects either by accelerating them (e.g., by making depressive or high neuroticism participants even more aware of their unpleasant states) or by ameliorating them (e.g., by enabling depressive or high neuroticism people to select activities and environments beneficial to well-being). Future research should examine the effects of feedback on potential reactivity. We also did not include a comparison condition in which people reported their unhappiness or other emotional states. While this design feature allowed us to focus participants' attention on happiness, without testing other states, it is not possible to generalize our findings to other valenced emotional states.

This study has several implications. Foremost, our findings shed light on the potential reactive effects of emotion tracking by demonstrating that reactivity depends on individual difference factors. Future experiments aiming to replicate prior research (e.g., Mauss et al., 2005; Schooler et al., 2003) might consider including trait emotion factors as moderators, which may lead to greater consistency in findings. Our results also suggest that testing for reactivity in experience sampling data by examining main-effect changes in states, symptoms, or behaviors may underestimate the extent of reactivity. Thus, like Barta, Tennen, and Litt (2012), we also encourage more systematic investigation into "moderated reactivity" that takes into account individual differences.

From a technology standpoint, we have also demonstrated that text messaging through personal mobile phones is a feasible, efficient, and low-cost platform for collecting brief self-report data in large samples (see also Kemp, Burt, & Furneaux, 2008; Kuntsche & Robert, 2009). Participants responded relatively quickly to most of the texts they received (< 2 minutes), showed excellent response rates (96%), and reported feeling very comfortable with the procedure. Thus, text messaging can be added to a list including web-enabled smartphones and the Day Reconstruction Method as tools for conducing large-scale experience sampling (see Mehl & Conner, 2012). Importantly, use of these tools will require continued research into the potential reactive effects of self-tracking.

Our findings also suggest some caution in the use of happiness-related mobile technology—but only for some individuals, under some conditions. Specifically, we observed that depressive or high-neuroticism people showed downturns in their happiness as tracking increased from 1 to 3 to 6 reports per day. Given these patterns, we might (tentatively) suggest that answering more than 3 happiness reports per day for 2 weeks or more may not be beneficial for this population. While it is not known whether depressed or neurotic individuals are more or less likely to use mobile happiness-tracking tools, the current findings suggest that excessive happiness tracking—without proper restraint, support, or guidance—might not be a good strategy of self-improvement for individuals with emotional vulnerabilities. Thus, for some people, there may be some truth to the observation made by the utilitarian philosopher John Stuart Mill: "Ask yourself whether you are happy and you cease to be so" (1873/1989, p. 94, cf. Kurtz & Lyubomirsky, 2012). Although excessive self-reflection may be ill-advised, as noted by Kesebir and Diener (2008), engaging in activities like meditation and counting blessings may be suitable strategies for boosting happiness. Conveniently, there are mobile applications for enacting these happiness-boosting activities in daily life (e.g., Live Happy™).

More broadly, our findings suggest that a hyperfocus on happiness common in today's "happiness climate" may have negative consequences to some individuals. In this way, our results parallel recent research showing that people with low self-esteem feel worse after making positive self-statements ("I am a lovable person"; Wood, Perunovic, & Lee, 2009). Just like Wood and colleagues found that positive

thinking backfired for those with negative self-concepts, we found that evidence that intensive reflection on happiness backfired for those with negative emotional tendencies. These findings also complement those of a recent laboratory study, suggesting that people who value happiness, paradoxically, may experience less happiness after positive events because they are disappointed in their experience (Mauss, Tamir, Anderson, & Savino, 2011). Given the growing awareness of the boundary conditions and potential costs of excessive positivity (Gruber, Mauss, & Tamir, 2011), perhaps these studies suggest the time is right for a healthy correction in the pursuit of happiness.

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Notes

1. This sample excluded 5 participants with incomplete data (<75% of texts), 4 for technical issues, 3 for noncompliant texting, and 61 randomized into a fourth condition who did not report their momentary happiness.
2. Patterns of moderation for depressive symptoms and neuroticism were similar when testing the three happiness items separately. Moderation was somewhat stronger for changes in reporting feeling "positive about life," compared to changes in "feeling happy" and "enjoyment," which were still mostly significant.
3. Analyses for all moderators (depressive symptoms, neuroticism, self-esteem, trait happiness, and texting experience) were re-run excluding the three individuals identified as outliers in the Figure 1 box plot. All significant effects for depressive symptoms and neuroticism remained significant, except for the trend found for depressive symptoms moderating the effect of responding to 1 versus 3 texts per day, which was no longer a trend, Time × Dummy1 × CES-D G14 $b(SE) = -.0029(.0018)$, $p = .11$. All tests for self-esteem, trait happiness, and texting experience remained nonsignificant. Moreover, the trends originally found for self-esteem were no longer trends, Time × Dummy1 × RSES G14 $b(SE) = .038(.025)$, $p = .13$; Time × Dummy2 × RSES G15 $b(SE) = .033(.025)$, $p = .19$.

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