

A Tuesday in the Life of a Flourisher: The Role of Positive Emotional Reactivity in Optimal Mental Health

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Flourishing—a state of optimal mental health—has been linked to a host of benefits for the individual and society, including fewer workdays lost and the lowest incidence of chronic physical conditions. The aim of this paper was to investigate whether and how routine activities promote flourishing. The authors proposed that flourishers thrive because they capitalize on the processes featured in the broaden-and-build theory of positive emotions, specifically by experiencing greater positive emotional reactivity to pleasant events and building more resources over time. To test these hypotheses, the Day Reconstruction Method (DRM) was administered to a prescreened community sample of adults ($n = 208$), and they were recontacted two to three months later. Results showed that relative to those who did not flourish or were depressed, people who flourish generally responded with bigger “boosts” in positive emotions in response to everyday, pleasant events (helping, interacting, playing, learning, spiritual activity), and this greater positive emotional reactivity, over time, predicted higher levels of two facets of the cognitive resource of mindfulness. In turn, these higher levels of mindfulness were positively associated with higher levels of flourishing at the end of study, controlling for initial levels of flourishing. These results suggest that the promotion of well-being may be fueled by small, yet consequential differences in individuals’ emotional experience of pleasant everyday events. Additionally, these results underscore the utility of the broaden-and-build theory in understanding the processes by which flourishing is promoted and provide support for a positive potentiation perspective.

Keywords: flourishing, mental health, broaden-and-build, positive emotions, mindfulness

Flourishing is a state of optimal mental health. By definition, people who flourish not only feel good but also do good: they experience positive emotions regularly, excel in their daily lives, and contribute to the world around them in constructive ways (Keyes, 2007). Flourishing is important to study for at least three reasons. One is that well-being is determined not only by the absence of psychopathology but the presence of that which is “good.” Indeed, mental illness and mental health appear to form two separate latent constructs—each dimension worthy of study in its own right (Keyes, 2005; Payton, 2009). Second, the presence of mental health is itself associated with a host of benefits for the individual and society (Keyes, 2007). These include fewer workdays lost, fewer limitations in daily activities, and lower health

care utilization. Flourishers, or what Keyes labels the “completely mentally healthy” (high mental health plus the absence of mental illness), also report the lowest incidence of chronic physical conditions (Keyes, 2005). Third, the prevalence of optimal mental health is relatively low. Epidemiological studies suggest that less than half of the U.S. adult population experiences high mental health.

The benefits of flourishing, coupled with its relative infrequency, raise the critical question, how do flourishers flourish? One way to address this question is to examine the daily lives of people who do and do not flourish. Given that a required diagnostic criteria for flourishing is positive emotionality (Keyes, 2002), perhaps flourishers, wittingly or unwittingly, cultivate an abundance of positive states in their day-to-day lives. Specifically, flourishers may respond more positively to typical daily activities and consequently trigger emotion-based mechanisms that maintain their well-being over time. As such, the positive emotional moments characteristic of flourishing may be more than a sign of flourishing, but rather the means by which flourishing is sustained and enhanced over time. This logic is consistent with the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001, 2004). The broaden-and-build theory states that unlike negative emotions, which narrow people’s attention and cognitions, positive emotions broaden attention and thinking. Over time, the expansive mindsets triggered by positive emotions help people to discover and build a variety of personal resources—psychological, cognitive, social and physical—which ultimately contribute to well-being. The broaden effect of positive emotions has now been

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supported experimentally across multiple laboratories (Fredrickson & Branigan, 2005; Rowe, Hirsh, & Anderson, 2007; Schmitz, De Rosa, & Anderson, 2009; Wadlinger & Isaacowitz, 2006). The build effect has also recently received experimental support (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008).

Flourishers may thus achieve optimal mental health because, wittingly or unwittingly, they exploit in their daily lives the broaden-and-build effects of positive emotions. In this study, we examine the relationship between positive emotional reactivity on a single day—a Tuesday—and a given resource, namely mindfulness, over time. We expect that flourishers may experience bigger “boosts” in positive emotions in response to pleasant, everyday events and thereby over time build more resources, ultimately sustaining or even enhancing their well-being. We conducted the current study to investigate a sequence of processes that we propose reflect a larger dynamic system that promotes flourishing. Although we sampled only one day in the life of our participants, we believe that positive emotional reactivity on that particular Tuesday is representative of enduring emotional tendencies likely to be present on many if not most days for these participants. As such, we assume that levels of mindfulness observed in the future may be attributable to past repeated experiences of heightened positive emotional reactivity. This reasoning is consistent with the broaden-and-build theory, which serves as the developmental logic and theoretical basis of the system we propose exists. We include a sample of depressed individuals to serve as a benchmark for the emotional responses of flourishers and non-flourishers. We also spotlight six pleasant activities known to elicit positive emotions. These included helping, interacting with others, playing, learning, engaging in spiritual activity, and exercising.

Research suggests that *helping*, or engaging in pro-social behavior, leads to more positive emotions. Experimental work has shown that spending money on others in the form of a gift or charitable donation predicted increases in happiness later that day (Dunn, Aknin, & Norton, 2008). Similarly, participants who committed five acts of kindness in a single day for six consecutive weeks experienced increases in their happiness by the end of the experimental intervention (Lyubomirsky, Tkach, & Sheldon, 2004, as cited in Lyubomirsky, Sheldon, & Schkade, 2005).

The link between *interacting* with others and positive emotions has also received strong empirical support. After being induced to engage in a social interaction, like getting acquainted with another person, participants experienced more positive emotions (McIntyre, Watson, Clark & Cross, 1991). The relationship between interacting and positive emotions has also been examined using the Day Reconstruction Method (Srivastava, Angelo, & Vallereux, 2008; Fredrickson et al., 2008). When interacting with others, participants reliably report more positive emotions.

Research on flow—the experience of pure engagement in which a sense of time and space is lost—informs the link between *playing* and positive emotions. Flow, which often occurs during activities like playing a game of chess or playing basketball, indicates that playing is intrinsically rewarding (Csikszentmihalyi, 1975) and thus is associated with positive emotions. The laughter infants exhibit during play also suggests its association with positive emotions. When engaging in playful behavior like pulling a cloth dangling from their mothers’ mouth, infants laugh (Sroufe & Waters, 1976).

Research suggests that *learning* something new increases positive emotions. Experimental work has shown that when infants learn a contingency between pulling a string and the presentation of a pleasant image and song, they express more joy, interest, and surprise, relative to when there is no contingency between these two events (Lewis, Alessandri & Sullivan, 1990). Literature on curiosity—the tendency to crave new information and experiences and seek them out—is theorized to lead to positive affect and, over time, a more meaningful life (Kashdan, Rose, & Fincham, 2004). Indeed, daily curiosity is associated with more daily life satisfaction (Kashdan & Steger, 2007).

Engaging in *spiritual activity*, like meditation, also increases positive emotions. Practicing loving-kindness meditation for a period of several weeks increased participants’ daily positive emotions over time (Fredrickson et al., 2008). The relationship between praying, worshipping, or meditating was also examined using the Day Reconstruction Method at the end of the study (Fredrickson et al., 2008). When participants reported praying, worshipping, or meditating in their episodes, they experienced more positive emotions.

The link between *exercising* and positive emotions has been particularly well-established. A recent meta-analysis of 158 studies revealed that engaging in acute aerobic exercise produced increases in positive emotions (Reed & Ones, 2006). Interestingly, these changes appear to last for up to 30 minutes postexercise.

Inspired by the broaden-and-build theory, we posit here that greater positive emotional reactivity—or “boosts”—over time lead to greater resources, namely the facets of mindfulness. Mindfulness refers to the tendency to be attentive to and aware of the present moment in a nonjudgmental manner and is associated with several indicators of well-being (Brown & Ryan, 2003; Baer, Smith, Hopkins, Krietemeyer, Toney, 2006; Brown, Ryan, & Creswell, 2007). Experiences of positive emotions, induced through loving-kindness meditation, have been shown to build mindfulness (Fredrickson et al., 2008), a finding that bolsters our confidence that a similar link between greater positive emotional reactivity and greater mindfulness might exist. Moreover, the broadened attention associated with positive emotions, characterized as relaxed inhibitory control (Rowe et al., 2007; Schmitz et al., 2009), may support individuals’ tendencies to be more fully attentive and aware of the present moment in a mindful, nonjudgmental manner.

Research on mindfulness is growing rapidly. As a result of the variety of theoretical perspectives on mindfulness, the definition of this construct remains open-ended (Coffey, Hartman, & Fredrickson, 2010). For instance, one conceptualization of mindfulness—provided by a group of researchers assembled to create a consensual definition of the construct—includes an attentional component, involving a focus on the present moment, and an attitudinal component, marked by an openness and acceptance of the present moment (Bishop et al., 2004). Empirically, factor analytic work suggests that five factors emerge when examining numerous self-report measures of mindfulness (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). These factors are *observing, describing, acting with awareness, non-*

judging of experience, and *nonreactivity to inner experience*,¹ and comprise the five subscales of the Five Factor Mindfulness Questionnaire. Although it is debatable whether all five facets are equally important in conceptualizing mindfulness (Coffey et al., 2010), we use this comprehensive measure to assess mindfulness in the current study.

Now we propose the last step in the sequence of emotional processes that we hypothesize to be involved in the maintenance or enhancement of flourishing: To the extent that greater positive emotional reactivity predicts greater mindfulness, we predict that mindfulness will in turn contribute to individuals' flourishing. The consequences of mindfulness for optimal functioning are many. Research suggests that mindfulness may facilitate better behavioral regulation. For example, individuals higher in certain facets of mindfulness—*nonjudging of inner experience* and *nonreactivity to inner experience*—persist longer on solving difficult anagrams, irrespective of how many anagrams they had solved (Evans, Baer, & Segerstrom, 2009). Mindfulness may improve other aspects of positive functioning as well. Participants who engaged in a mindfulness-based stress reduction program felt more purpose and environmental mastery, and these positive changes were reflected in concurrent changes in a composite measure of mindfulness, comprising *observing*, *nonjudging of inner experience*, and *nonreactivity to inner experience* (Carmody, Baer, Lykins, & Olendzki, 2009). Mindfulness may also improve relations with others. Romantic couples who engaged in a mindfulness-based intervention experienced various improvements in their relationships, including more relationship satisfaction, partner acceptance, closeness, and less distress (Carson, Carson, Gil, & Baucom, 2004).

Our proposal that emotional reactivity is consequential to optimal mental health echoes research on the development and maintenance of depression. According to the negative potentiation perspective, negative emotions are characteristic of depression and also promote depressive symptoms (Morris, Bylsma, & Rottenberg, 2009). Indeed, research has shown that individuals who displayed greater negative emotional sensitivity to daily interpersonal stressors displayed an increase in depressive symptoms over time (O'Neill, Cohen, Tolpin, & Gunthert, 2004; Cohen, Gunthert, Butler, O'Neill & Tolpin, 2005). Similarly, in clinical samples of depressed and anxious adults, individuals who displayed greater negative emotional reactivity in response to how undesirable a stressful event was showed less of a decrease in their depressive symptoms over the course of treatment (Cohen, Gunthert, Butler, O'Neill & Tolpin, 2005). We speculate that individuals with greater negative emotional sensitivity may even over time erode important resources like mindfulness or resilience, thereby promoting depressive symptomology. The current research seeks to uncover a parallel positive potentiation process by which flourishing is sustained. Such processes could illuminate how a very beneficial, yet relatively uncommon, state of mental health is maintained.

Testing our hypotheses invites a detailed look into people's daily lives, a look well provided by the recently developed Day Reconstruction Method (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004). The Day Reconstruction Method is a technique used to capture people's emotional experiences within everyday life. Participants reflect upon the previous day and create a diary of all their activities from waking up to going to sleep. After creating

a contiguous series of episodes to represent their "yesterday," participants are then asked to reflect on each episode and first report the activities in which they were engaging and then the emotions they experienced. With the particulars of the previous day cued by the DRM, reporting biases are minimized (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004). For example, although people generally report that spending time with their own children is a pleasant activity, research using the DRM yields the nonintuitive finding that episodes in which children are copresent rank among the lowest in enjoyability among a list of common daily activities (Kahneman & Krueger, 2006). In addition, the DRM offers a more inclusive study of everyday events, in comparison with experience-sampling techniques. The entire day is accounted for, so relatively uncommon events that may occur only once a day (e.g., playing a game) can also be studied.

We propose that flourishers thrive because they capitalize on the positive potentiation processes of the broaden-and-build theory. We distill this overarching prediction into the following three hypotheses:

Hypothesis 1. The positive emotional benefit of engaging in targeted pleasant activities will be stronger for flourishers than for non-flourishers or depressed individuals.

Hypothesis 2. To the extent that we find support for Hypothesis 1, greater displays of positive emotional reactivity will result in greater levels of mindfulness over time.

Hypothesis 3. To the extent that we find support for Hypothesis 2, positive changes in mindfulness will predict positive changes in signs of flourishing.

Method

Participants

Participants were 208 adult community-members (59% female) across the United States who responded to advertisements (see below) to complete web-based surveys in exchange for monetary compensation. Ages ranged from 22 to 60, with a mean of 42 ($SD = 9.8$). The racial composition was 84% White and 16% Black.

Procedure

The study was conducted in three phases: a classification phase ("Pre-DRM"), the administration of the DRM (Daily Reconstruc-

¹ At first glance, it may seem incongruous to posit that greater positive emotional reactivity may lead to higher *nonreactivity to inner experience*. Yet considering the definition of *nonreactivity to inner experience* (allowing distressing thoughts and feelings to come and go without getting caught up in them or overwhelmed by them), the link may no longer seem problematic, as this facet of mindfulness focuses on individual's reactions to *negative* thoughts and feelings. Given the flexibility that bigger "boosts" of positive emotions may offer, it seems plausible that greater positive emotional reactivity could affect the ability to manage distressing experiences with more openness. Indeed, ample past research has demonstrated that positive emotions help people cope with and recover from negative emotional experiences (Fredrickson, Mancuso, Branigan, & Tugade, 2000; Fredrickson, Tugade, Waugh & Larkin, 2003; Tugade & Fredrickson, 2004).

tion Method), and a recontact phase ("Post-DRM"). The primary goal of the classification phase was to identify flourishers, non-flourishers, and depressed people. To screen out mental illness in our flourishing and non-flourishing groups, we used questionnaires to assess three common types of mental illness, namely depression, anxiety, and substance disorders (Kessler, Chiu, Demler, & Walters, 2005). We recruited participants through several different methods (e.g., flyers, email) from January to May in 2007. Given the low percentage of the population thought to qualify as flourishers (17%; Keyes, 2002), we aimed to oversample this group. With this aim in mind, the various recruiting methods asked "What does it take to do well in life?", "What does it take to be happy?", or no lead-in question at all and then described the opportunity to take part in a web-based survey to receive \$20.

In July 2007, the administration of the DRM began. For five consecutive weeks, we contacted participants identified as flourishers, non-flourishers, and depressed people (see below for selection criteria) via email on Fridays, alerting them that the following Wednesday they would have the opportunity to complete the web-based DRM survey in exchange for \$50. The following Wednesday morning, we sent participants electronic invitations to complete the DRM, so that they could report on their Tuesdays—a weekday likely characteristic of typical day-to-day life. We continued contacting participants to complete the DRM until we met our goal of surpassing $n = 200$.

In October 2007, the recontact phase took place. Participants who had completed the DRM were emailed and invited to complete a series of person-level measures in exchange for \$20 and the chance to win one of two \$100 gift certificates. In the recontact phase our sample size decreased to 178 individuals.

Measures

Pre-DRM (Classification of Flourishers, Non-Flourishers, Depressed)

Beck Depression Inventory. The Beck Depression Inventory assesses depressive symptoms (Beck, Steer, & Garbin, 1988). Participants rate the intensity of the 21 depressive symptoms experienced during the past few days on a four-point scale, ranging from 0 to 3. For example, for the symptom Crying, the response options are "I don't cry any more than usual," "I cry more than I used to," "I cry all the time now," and "I used to be able to cry, but now I can't cry even though I want to" ($\alpha = .95$). Consistent with guidelines from the Center for Cognitive Therapy, participants who scored higher than 10 qualified for depression (Beck, Steer, & Garbin, 1988). For the current study, depressed people also were low on mental health (i.e., signs of flourishing).

The Composite International Diagnostic Interview Short Form—Alcohol Dependence and Drug Dependence. The Composite International Diagnostic Interview Short Form (CIDI-SF) assesses alcohol and drug dependence, among other major psychological disorders (Walters, Kessler, Nelson, & Mroczek, 2002; Kessler, Andrews, Mroczek, Ustun & Wittchen, 1998). Participants qualify for alcohol dependence if they consumed at least four drinks within a single day in the last 12 months, and indicate agreement to three or more symptoms of *DSM-III-R* alcohol dependence on a 2-point scale (1 = *Yes*, 0 = *No*.) Participants qualify for drug dependence if they have used drugs without

a doctor's prescription, in larger amounts than prescribed, or for a longer period than prescribed in the last 12 months, and indicate agreement to three or more symptoms of *DSM-III-R* drug dependence on a two-point scale (1 = *Yes*, 0 = *No*).

Beck Anxiety Inventory. The Beck Anxiety Inventory assesses anxiety symptoms experienced in the past month (Beck, Epstein, Brown, & Steer, 1998). Participants indicate agreement or disagreement on a 4-point scale from 0 (*Not at all*) to 3 (*Severely, it bothers me a lot*) with 21 items, including "Fear of worst happening" and "Unable to relax" ($\alpha = .94$). We chose to exclude participants with moderately high levels of anxiety, and as such used a cut-off of 21 (Kabacoff, Segal, Hersen, & Hasselt, 1997).

Mental Health Continuum—Short Form. The Mental Health Continuum—Short Form assesses the presence of flourishing as the combination of emotional well-being, psychological well-being, and social well-being (Keyes, 2009). Participants indicate agreement or disagreement on a six-point scale from 1 (*Never*) to 6 (*Everyday*) with 14 items divided into three subscales: emotional well-being, including "In the past month, how often did you feel satisfied?" ($\alpha = .87$), psychological well-being, including "In the past month, how often did you feel that your life had a sense of direction or meaning to it?" ($\alpha = .89$), and social well-being, including "In the past month, how often did you feel that you had something important to contribute to society?" ($\alpha = .82$).

Once screened for depression, anxiety, and substance use, participants qualified as flourishers if they scored high on the emotional well-being scale (i.e., report "almost every day" or "every day" to at least one of the items) and high on the psychological/social well-being scale (i.e., report "almost every day" or "every day" to at least six of the items) (Keyes, 2009). Nonflourishers were identified by displaying an absence of mental illness and lower level of mental health. Once screened for depression, anxiety, and substance abuse, participants qualified as non-flourishers if they exhibited relatively low levels on *either* or *both* the emotional well-being scale (i.e., report lower than "almost every day" or "every day" on all the items) and the psychological/social well-being scale (i.e., report lower than "almost every day" or "every day" on eight or more items).² Once screened for substance abuse, participants qualified as depressed if they exhibited abnormal levels of depression (i.e., higher than a score of 10). Because depression is often comorbid with anxiety, depressed participants also could exhibit signs of anxiety. We did not recontact depressed participants for the DRM portion of the study if they also showed signs of substance abuse. To test Hypothesis 3, we used the Mental Health Continuum—Short Form as a continuous assessment by computing the mean of all 14 items, a scoring procedure also recommended by Keyes (2009).

Cognitive Resource (Pre-DRM and Post-DRM)

Five Facet Mindfulness Questionnaire. The Five Facet Mindfulness Questionnaire assesses the tendency to be present-focused in a nonjudgmental way (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Participants indicate agreement or dis-

² Because our aim was to understand the unique properties of flourishing individuals, in comparison with those who do not flourish, we differ from Keyes by not separating non-flourishing individuals into groups, such as the "moderately mentally healthy" and "languishers."

agreement on a five-point scale from 1 (*Never or very rarely*) to 5 (*Very often or always true*) with 39 items divided into five subscales: *observing* (attending to internal/external experiences), including “I pay attention to sensations, such as the wind in my hair or sun on my face” (T1: $\alpha = .86$, T2: $\alpha = .84$), *describing* (labeling experiences), including “I can easily put my beliefs, opinions, and expectations into words” (T1: $\alpha = .90$, T2: $.93$), *nonjudging of experience* (taking a nonevaluative stance toward thoughts and feelings), including “I tell myself I shouldn’t be feeling the way I’m feeling” (reverse-scored; T1 $\alpha = .90$, T2: $.92$), *nonreactivity to inner experience*³ (allowing thoughts and feelings to come and go without getting caught up in them), including “When I have distressing thought or images, I just notice them and let them go” (T1: $\alpha = .68$, T2: $\alpha = .76$), and *acting with awareness* (attending to one’s current activities as opposed to functioning on automatic pilot), including “I find it difficult to stay focused on what’s happening in the present” (reverse-scored; T1: $\alpha = .91$, T2: $.88$). We computed the mean for each subscale of mindfulness.

DRM (Day Reconstruction Method)

The DRM provided a detailed record of each participants’ day, by asking them to reconstruct the previous day into a series of episodes and answer questions about their activities and emotions within each episode. For each episode, we asked participants whether or not they were engaging in the targeted pleasant activities, in addition to other activities not relevant to the current paper. The targeted activities included *helping*, *interacting*, *playing*, *learning*, *spiritual activity*, and *exercising*. For instance, participants were asked “During this episode, to what degree were you helping someone?” or “During this episode, were you interacting?” The response options were “not at all” (1) to “very much so” (5), and *yes* (1) and *no* (0), respectively. The response options for the activity *learning* were also scaled, and the response options for the activities *playing*, *spiritual activity*, and *exercising* were binary. In the interest of brevity, the label *spiritual activity* serves as an umbrella term for the item “During this episode, were you praying, worshipping, or meditating?”; *playing* serves as an umbrella term for the item “During this episode, were you playing a game/sport or practicing a hobby?”; and *learning* serves as an umbrella term for the item “During this episode, to what degree were you learning something new?”.

Additionally, for each episode, we asked participants the degree to which they experienced several positive and negative emotions using the Modified Differential Emotions Scale (mDES; Fredrickson, Tugade, Waugh, & Larkin, 2003). Participants indicated agreement or disagreement on a five-point scale from 1 (*not at all*) to 5 (*extremely*) with 12 positive emotions, including amusement, awe, excitement, gratitude, hope, inspiration, interest, joy, love, pride, contentment, and serenity, and 10 negative emotions, including anger, shame, boredom, contempt, disgust, embarrassment, guilt, hatred, sadness, and fear. We computed the mean across the 12 positive emotions to create a composite positive emotions variable for each episode ($\alpha = .94$). Likewise, we computed the mean across the 10 negative emotions to create a composite negative emotions variable for each episode ($\alpha = .77$).

Results

Descriptive Analyses

Our sample included 108 flourishers,⁴ 67 non-flourishers, and 33 depressed people. The number of depressed individuals who also displayed signs of anxiety were four individuals. For the DRM portion of the study a total of 3,204 episodes were reported. On average, participants reported on 16 episodes ($SD = 5.5$). Given the format of the DRM, more than one of the targeted activities could have been reported within a single episode (Kahneman, Krueger, Schkade, Schwarz, Stone, 2004b). This happened relatively frequently for all targeted activities. For instance, in an episode labeled “took crisis call” the participant reported helping, learning, and interacting.⁵ Table 1 presents demographic information. The three groups did not significantly differ from each other in sex, race, age, or marital, work, or socioeconomic status. Consistent with earlier work (Keyes, 2005), a significant difference emerged in the amount of illness symptoms flourishers, non-flourishers, and depressed individuals reported, $F(2, 199) = 8.33$, $p < .01$. A post hoc Tukey’s HSD test revealed that flourishers and non-flourishers displayed significantly fewer illness symptoms relative to depressed people. Because of these differences, we tested whether the interaction between illness symptoms and the target activities altered the results we presented for Hypothesis 1. We discovered that physical symptoms did predict positive emotional reactivity to two target activities: helping and learning. However, these effects were independent of the effects featured for Hypothesis 1.⁶

Hypothesis 1. The positive emotional benefit of engaging in targeted pleasant activities will be stronger for flourishers than for non-flourishers or depressed individuals.

³ For the FFMQ administered at the Pre-DRM phase, because of a clerical error, we only have two of the seven items for the subscale *nonreactivity to inner experience*.

⁴ Of the 296 participants exhibiting high levels of emotional well-being and psychological/social well-being in the “Pre-DRM” phase of the study, 42 were not recontacted for the DRM portion of the study because they also showed signs of mental illness. We acknowledge that studying individuals high in mental health with signs of mental illness would be incredibly valuable and an important area for future research. For the current study, however, we were interested in comparing relatively “pure” samples of flourishers and non-flourishers, by examining two samples who each lacked a mental illness, but differed in the degree to which they experienced high or low mental health.

⁵ Of all the episodes in which helping was reported, 89% of the episodes also reported at least one other target activity. For all the episodes in which interacting was reported, 75% of the episodes also reported at least one other target activity. For all the episodes in which playing was reported, 93% of the episodes also reported at least one other target activity. For all episodes in which learning was reported, 81% of the episodes also reported at least one other target activity. For all episodes in which spiritual activity was reported, 72% of the episodes also reported at least one other target activity.

⁶ The only exception is that in the presence of the interaction between illness symptoms and learning, the marginally significant contrast between flourishers and depressed individuals became nonsignificant.

Table 1
Participant Demographics by Mental Health Status

| Participant characteristic | Flourishers | Non-flourishers | Depressed |
|----------------------------|-------------|-----------------|-----------|
| <i>n</i> | 108 | 67 | 33 |
| % female | 61.1% | 52.2% | 66.7% |
| % white | 83.3% | 86.6% | 78.8% |
| Age | 41.8 | 42.4 | 39.1 |
| % cohabitating/married | 65.7% | 69.7% | 66.4% |
| SES | 3.1 | 2.9 | 2.8 |
| % not working for pay | 14.3% | 11.3% | 30.3% |
| Illness symptoms** | 1.67 | 1.87 | 2.28 |

Note. SES assesses relative economic and social standing on a five-point scale (1 = barely enough to get by, 2 = enough to get by but no more, 3 = solidly middle class, 4 = plenty of extras, 5 = plenty of luxuries). We assessed illness symptoms with a scale comprising 13 common symptoms of poor health, including headaches, stiff muscles, nausea, and coughing. Participants reported the frequency of each symptom over the past month on a seven-point scale from 1 (*not at all*) to 7 (*very frequently*).
* $p < .05$. ** $p < .01$.

Data Analysis Plan

To Test Hypothesis 1, we used multilevel modeling, a useful tool for data sets comprising two levels of analyses, with one level nested within the other. For the current study, Level 1 is episode-level data (e.g., the degree of positive emotions experienced within an episode), and Level 2 is person-level data (e.g., the mental health status of the participant—flourisher, non-flourisher, depressed). Level 1 episode-level data is nested within Level 2 person-level data. To evaluate whether or not the association between episode-level activity engagement and episode-level positive emotions differed depending on the participant’s mental health status, we used the following model:

$$\begin{aligned} \text{Level 1} \quad PE_{ij} &= B_{0j} + B_{1j}(\text{Targeted Activities}_{ij}) + r_{ij} \\ \text{Level 2} \quad B_{0j} &= \gamma_{00} + \gamma_{01}(\text{Code 1/Non-Flourisher}) \\ &\quad + \gamma_{02}(\text{Code 2/Depressed}) + u_{0j} \\ B_{1j} &= \gamma_{10} + \gamma_{11}(\text{Code 1/Non-Flourisher}) \\ &\quad + \gamma_{12}(\text{Code 2/Depressed}) + u_{1j} \end{aligned}$$

The Level 1 equation examines the episode-level association, for each individual, between activity engagement and positive emotions, or the main effect of the target activities on positive emotions per person. Given that *helping* and *learning* are continuous variables, B_{1j} is person-mean centered. Because *interacting*, *playing*, and *spiritual activity* are binary variables, we chose not to person-mean center B_{1j} , to preserve the substantive interpretation of the effects.⁷ Consistent with previous research using DRM (e.g., Kahneman et al., 2004) we ran a separate model for each activity. As such, it is possible that effects for one activity are not completely independent of effects observed for other activities.

Mental health status differences in the average episode-level association between activity engagement and positive emotions (Hypothesis 1) were tested at Level 2.⁸ In the Level 2 equations, all of the Level 1 variables (i.e., B_{0j} , B_{1j}) were predicted by the two dummy codes signifying the three types of participants (flourishers, non-flourishers, depressed people). In Code 1, non-flourishers were coded as 1 and the rest were coded as 0. In Code 2, depressed

people were coded as 1 and the rest were coded as 0. This set of dummy codes establishes flourishers as the reference group.

Preliminary Analyses

To determine the amount of episode-level and person-level variability in positive emotions, we calculated the intraclass correlation—an index of the amount of dependence in the data. The intraclass correlation was .5387, suggesting that 53.87% of the variability in positive emotions was attributable to differences from person to person and 46.13% of the variability was attributable to differences from episode to episode within people. Although not directly relevant to Hypothesis 1, we found evidence consistent with past evidence that flourishing is distinguished by *level* differences in positive emotionality. The size and significance of γ_{01} and γ_{02} provides background information on the degree to which flourishers’ average episodic positive emotions differ from those of non-flourishers and depressed people. As shown in Table 2, flourishers consistently experienced significantly more positive emotions in their episodes, compared with non-flourishers and depressed people. For example, the average episodic positive emotions experienced by flourishers within episodes not identified as interacting (i.e., B_{1j} has a value of “0”) was 2.29, compared with 1.90 for non-flourishers and 1.85 for depressed people. That is, during episodes lacking interaction, flourishers reported feeling slightly more than “a little bit” of positive

⁷ When we person-mean centered the activities *interacting*, *playing*, and *spiritual activity*, the pattern of results remained the same. Even though person-mean centering may not make sense for these activities for substantive interpretation, we gained reassurance with this reanalysis that the results for Hypothesis 1 are not attributable to more or less engagement in the targeted activities.

⁸ Preliminary analyses incorporated sex and race of participant as a predictor of positive emotional reactivity. Sex did not predict positive emotional reactivity to the target activities. Race did predict positive emotional reactivity to the target activities exercising, helping, spiritual activity, and interacting, although two of the effects were positive and two of the effects were negative. These effects were independent of the effects featured in support of Hypothesis 1.

Table 2
Descriptive Statistics for Pre-DRM and Post-DRM Measures

| | Mean | SD |
|-----------------------------------|------|------|
| Pre-DRM | | |
| Observing | 3.46 | 0.69 |
| Describing | 3.54 | 0.76 |
| Nonjudging of experience | 3.63 | 0.73 |
| Nonreactivity to inner experience | 3.11 | 0.76 |
| Acting with awareness | 3.56 | 0.68 |
| Flourishing signs | 4.24 | 0.87 |
| Post-DRM | | |
| Observing | 3.35 | 0.69 |
| Describing | 3.66 | 0.78 |
| Nonjudging of experience | 3.67 | 0.76 |
| Nonreactivity to inner experience | 3.27 | 0.57 |
| Acting with awareness | 3.45 | 0.70 |
| Flourishing signs | 4.29 | 0.95 |

emotions on average, whereas non-flourishers and depressed people did not even report “a little bit” of positive emotions. These level differences in positive emotionality are statistically independent of the effects featured below.

Do Flourishers Experience Bigger Positive Emotional “Boosts”?

Three of the parameters in the Level 2 equations are key to evaluating Hypothesis 1. Because flourishers are the reference group, γ_{10} is the average degree to which engagement in the target activity is associated with positive emotions for flourishers, γ_{11} tests the difference between the slopes for non-flourishers and flourishers, and γ_{12} tests the difference between the slopes for depressed people and flourishers. Because the parameters γ_{11} and γ_{12} represent tests of the first hypothesis, these tests are one-tailed. For exploratory purposes, we manually coded a contrast to test differences between non-flourishers and depressed people. The results are presented in Table 3.^{9,10,11}

In comparison with non-flourishers and depressed people, flourishers displayed greater positive emotional reactivity when *helping*, *playing*, and *interacting*. For example, a one-point unit increase in *helping* was associated with a .13-unit increase in positive emotions for flourishers, compared with a .05-unit increase for non-flourishers and a .05-unit increase for depressed people. That is, the positive emotional “boost” flourishers experienced when engaging in more *helping* was 160% higher than non-flourishers and depressed people. Figure 1 presents the cross-level interaction between mental health status and the target activity *helping* on positive emotions, which portrays a general pattern observed for the given activity, as well as *playing*, *interacting*, *learning* and *spiritual activity*. A one-point increase in *playing* was associated with a .78-unit increase in positive emotions for flourishers, compared with a .48-unit increase for non-flourishers, and a .38-unit increase for depressed people. A one-point increase in *interacting* was associated with a .50-unit increase in positive emotions for flourishers, compared with a .27-unit increase for non-flourishers, and a .34-unit increase for depressed people.

We found nearly the same pattern with the activities *learning* and *spiritual activity*. With *learning*, flourishers displayed greater

positive emotional reactivity in comparison with non-flourishers, and marginally greater positive emotional reactivity in comparison to depressed people. A one-point increase in *learning* was associated with a .16-unit increase in positive emotions for flourishers, compared with a .08-unit increase for non-flourishers and a .09-unit increase for depressed people. With *spiritual activity*, flourishers displayed marginally greater positive emotional reactivity in comparison with non-flourishers, and marginally greater positive emotional reactivity in comparison to depressed people. A one-point increase in *spiritual activity* was associated with a .55-unit increase in positive emotions for flourishers, compared with a .33-unit increase for non-flourishers, and a .22-unit increase for depressed people. The effects of these five activities—*helping*, *playing*, *interacting*, *learning*, and *spiritual activity*—and their interaction with mental health status accounted for 3% to 11% of the variance in episode-level positive emotions. Further, for these five activities, the positive emotional benefits that non-flourishers received did not significantly differ from those of depressed people.

We did not find a similar pattern for the activity *exercising*. In comparison with depressed people, flourishers displayed marginally greater positive emotional reactivity when *exercising*. A one-point increase in *exercising* was associated with a .26-unit increase in positive emotions for flourishers, compared with a $-.01$ -unit decrease for depressed people. However, in comparison with non-flourishers, flourishers did not differ. Additionally, in comparison with depressed people, non-flourishers displayed greater positive emotional reactivity when *exercising*. A one-point increase in *exercising* was associated with a .40 increase in positive emotions for non-flourishers, compared with a $-.01$ -unit decrease for depressed people.

We also ran parallel analyses using negative emotions as the dependent variable. Only one cross-level interaction effect emerged, for the activity *helping*. Nonflourishers experienced fewer negative emotions when helping than depressed people. A

⁹ Additional analyses incorporated sex and then race as a moderator of the effects featured in support of Hypothesis 1. Sex moderated the comparison that pitted the positive emotional reactivity experienced by flourishers to depressed people for *playing*. Race moderated the comparison that pitted the positive emotional reactivity experienced by flourishers to depressed people for *spiritual activity* and *interacting*. In total, however, these significant effects accounted for only 7.1% of all tests completed and therefore may be spurious.

¹⁰ We reran the models featured in Hypothesis 1 with flourishing as a continuous measure. The pattern of results remained the same. To probe further whether either of the two components of flourishing—hedonic or eudaimonic—disproportionally contributed to the observed pattern of results, we calculated two separate composite scores—one hedonic and one eudaimonic. This approach is valuable given the probable conceptual overlap between the hedonic items on the flourishing measure and our dependent measure of positive emotional reactivity. In comparison with the full composite score of flourishing, the pattern of results for each subscale remained the same. The only difference worthy of note is that the magnitude of effect in the hedonic model decreased sizably for the activity *learning*. From this, we conclude that the eudaimonic aspects of flourishing contribute as much or more to the reported effects as do the hedonic aspects.

¹¹ We also reran the models featured in Hypothesis 1, controlling for autoregressive effects, and the pattern of results remained the same.

Table 3
Effects of Targeted Activities on Positive Emotions by Mental Health Status

| | Helping | Interacting | Playing | Learning | Spiritual activity | Exercising |
|--|---------------|---------------|---------------|---------------|--------------------|---------------|
| Intercept, B0 | | | | | | |
| (Reference = Flourisher), γ_{00} | 2.56** (.07) | 2.29*** (.07) | 2.50*** (.07) | 2.56*** (.07) | 2.50*** (.07) | 2.54*** (.07) |
| (Code 1 = Non-Flourisher), γ_{01} | -.54*** (.11) | -.39*** (.11) | -.50*** (.11) | -.54*** (.11) | -.51*** (.11) | -.54*** (.11) |
| (Code 2 = Depressed), γ_{02} | -.55*** (.14) | -.44*** (.14) | -.51*** (.14) | -.55*** (.14) | -.50*** (.11) | -.52*** (.14) |
| Slope, B1 | | | | | | |
| (Reference = Flourisher), γ_{10} | 0.13*** (.02) | 0.50*** (.04) | .78*** (.11) | .16*** (.02) | .55*** (.09) | 0.26* (.09) |
| (Code 1 = Non-Flourisher), γ_{11} | -.08* (.03) | -.23*** (.07) | -.30* (.18) | -.08* (.04) | -.22† (.16) | .14 (.14) |
| (Code 2 = Depressed), γ_{12} | -.08* (.04) | -.16* (.09) | -.40* (.21) | -.07† (.05) | -.33† (.22) | -.27 (.18) |
| Non-Flourisher vs. Depressed | .00 (.04) | .02 (.07) | .09 (.23) | -.01 (.06) | .12 (.24) | .41* (.19) |

Note. The contrast for non-flourisher versus depressed is γ_{11} - γ_{12} . Standard errors are in parentheses.
† $p < .10$. * $p < .05$. ** $p < .01$.

one-point unit increase in helping was associated with a .003 decrease in non-flourishers, compared with a .03 decrease in depressed people. We note that, in general, the target activities did not appear to elicit much negative emotion. For instance, for the three activities *interacting*, *spiritual activity*, and *exercising*, main effects on negative emotions did not exist.

Hypothesis 2. To the extent that we find support for Hypothesis 1, greater displays of positive emotional reactivity will result in greater mindfulness over time.

As shown in the previous section, compared with non-flourishers and depressed people, flourishers display greater (or marginally greater) positive emotional reactivity in response to five activities: *helping*, *interacting*, *playing*, *learning*, and *spiritual activity*. Given these findings, we were able to test whether variation in positive emotional reactivity in response to those target activities—which in large part reflects mental health status (flourishers, non-flourishers, depressed)—might over time predict higher levels of the cognitive resource of mindfulness.

To examine whether variation in positive emotional reactivity predicted greater mindfulness, we obtained individual measures of positive emotional reactivity in response to each of these five activities for each participant (we excluded *exercising* because it showed a null result for Hypothesis 1). The second model presents how the positive emotional reactivity scores were calculated. As the reader may notice, this equation parallels the part of the first

model that predicts the random slopes. Each individual’s positive emotional reactivity score (for each activity) was determined by the average positive emotional reactivity score for each mental health category (i.e., estimates for the fixed effects γ_{10} , γ_{11} , γ_{12}) and individual variability around these group means (i.e., estimates for the random effect u_{1j}). Random effect estimates are not typically provided automatically for individuals, but they can be obtained and are called empirical Bayes estimates (Raudenbush & Bryk, 2002). The dummy codes were the same as for Level 2 of Model 1, which keeps flourishers as the reference group. The “hats” indicate that estimates from the first model were used in lieu of the true, unknown, parameter values.

$$\text{Pos_Reactivity}_j = \hat{\gamma}_{10} + \hat{\gamma}_{11}(\text{Code1/Non-Flourisher}) + \hat{\gamma}_{12}(\text{Code2/Depressed}) + \hat{u}_{1j}$$

We discovered that the positive emotional reactivity scores for all five activities were internally consistent ($\alpha = .81$) and thus created *composite* positive emotional reactivity scores for ease of presentation. Then, we tested the effects of the composite positive emotional reactivity scores on each facet of Post-DRM mindfulness, controlling for Pre-DRM mindfulness. That is, we evaluated whether variation in positive emotion reactivity, which in large part reflects mental health status, might over time predict levels the cognitive resource of mindfulness. The third model presents the equation.

$$\text{Post-DRM_Mind}_j = B_0 + B_1(\text{Pre-DRM_Mind}_j) + B_2(\text{Comp_Pos_Reactivity}_j) + r_j$$

We used ‘Pre-DRM_Mind’ and ‘Post-DRM_Mind’ to indicate each of the five facets of mindfulness (*observing*, *describing*, *acting with awareness*, *nonjudging of experience*, and *nonreactivity to inner experience*). Each facet was tested individually and a Bonferroni correction was applied. Because these analyses represent tests of Hypothesis 2, the tests are one-tailed. Two of the estimated effects were significantly and positively influenced by differential boosts in emotional reactivity. Controlling for baseline mindfulness, individuals who experienced higher levels of positive emotional reactivity had higher *observing* (standardized $\beta = .16$, $p < .05$) and *nonreactivity to inner experience* (standardized $\beta = .27$, $p < .01$) facets of mindfulness Post-DRM than individuals who experienced lower levels of positive emotional reactivity. To

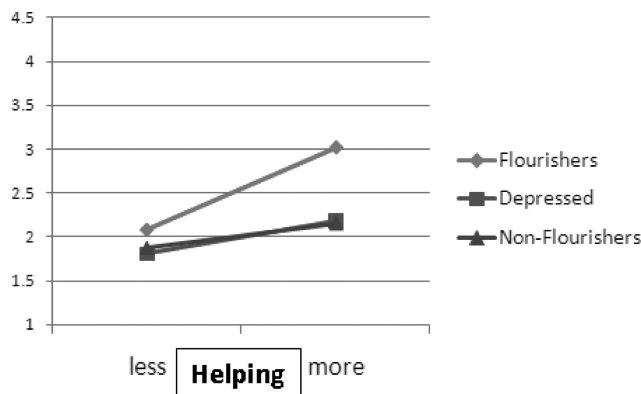


Figure 1. The cross-level interaction between mental health status and the target activity *helping* on positive emotions within episodes.

provide a visual illustration, Figure 2 presents the relationship between positive emotional reactivity (i.e., the composite positive emotional reactivity scores obtained earlier) and residual change in the *nonreactivity to inner experience* facet of mindfulness. The dramatic difference shown among the composite positive emotional reactivity scores of flourishers, non-flourishers, and depressed individuals is not altogether unexpected given that the scores were based on a model known to highlight the differences among these groups. Importantly, however, this graph highlights the positive slope between positive emotional reactivity and residual change in *nonreactivity to inner experience*.

Hypothesis 3. To the extent that we find support for Hypothesis 2, positive changes in mindfulness will predict positive changes in signs of flourishing.

Before testing the third hypothesis, we checked for evidence of regression to the mean in signs of flourishing across the Pre- and Post-DRM phases, given that we purposely targeted an extreme sample group. We discovered that although flourishers may represent an extreme sample group, approximately 44% still increased, 5% maintained, and 51% decreased in their signs of flourishing throughout the course of the study. These fluctuations reflect changes in participants' levels of psychological/social well-being and emotional well-being, although more participants displayed fluctuations in their levels of psychological/social well-being (94%), in comparison with their levels of emotional well-being (69%). To test the third hypothesis, we tested the effect of the residual change scores of each significant facet of mindfulness from the previous analysis (*observing*, *nonreactivity to inner experience*) on residual changes in the composite measure of flourishing signs. In addition, we created an average of the *observing* and *nonreactivity to inner experience* facet of mindfulness—representing overall changes in mindfulness—and tested the effect

of the residual change scores of this average on the residual change scores of the composite measure of signs of flourishing.

As hypothesized, positive changes in the *observing* facet of mindfulness predicted significant and positive changes in signs of flourishing (standardized $\beta = .30, p < .05$). Additionally, positive changes in the *nonreactivity to inner experience* facet of mindfulness predicted significant and positive changes in signs of flourishing (standardized $\beta = .15, p < .05$). Last, positive changes in the average of the *observing* and *nonreactivity to inner experience* facet of mindfulness—representing overall observed changes in mindfulness—predicted significant and positive changes in signs of flourishing (standardized $\beta = .25, p < .05$). We illustrate the association between these overall changes in mindfulness and changes in signs of flourishing by depicting the residual changes in flourishing symptoms by residual mindfulness quartiles in Figure 3.

Discussion

We sought to unravel the question of how flourishers flourish. By examining the daily lives of people who flourish, compared with those of people who do not flourish or are depressed, we discovered that flourishers generally respond more positively to pleasant activities, ranging from *interacting* to *learning*. (The exception to this pattern of results was *exercising*.) For instance, on average, the positive emotional boost a flourisher received when engaging in more *helping* within episodes was more than double than that of a non-flourisher or depressed individual: A one-point increase in helping behavior was associated with a .13-unit increase in positive emotions for flourishers, compared with a .05-unit increase for non-flourishers and a .05-unit increase for depressed people. Moreover, this greater positive emotional

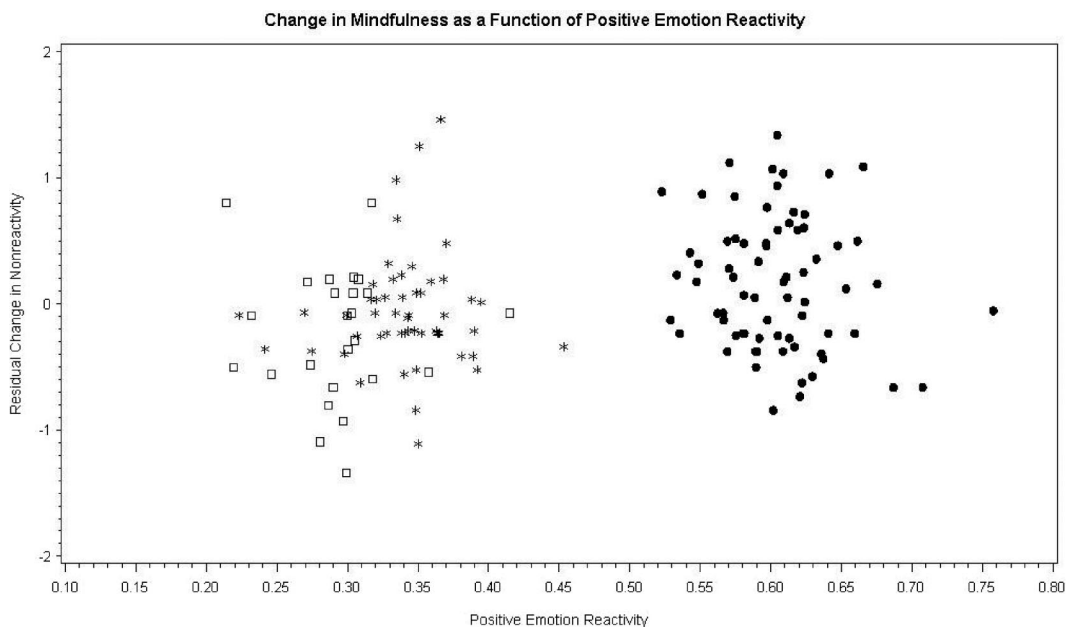


Figure 2. The association between positive emotional reactivity and residual change in the *nonreactivity to inner experience* facet of mindfulness. Flourishes are represented with dots, non-flourishes with stars, and depressed individuals with squares.

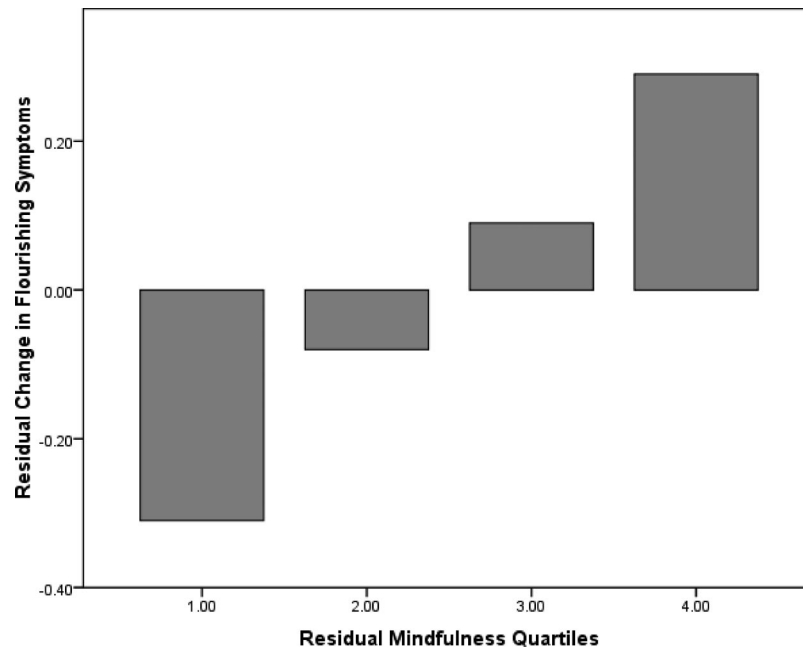


Figure 3. Residual changes in flourishing symptoms by residual mindfulness (average of *observing* and *nonreactivity to inner experience*) quartiles.

reactivity predicted higher levels, over time, of two facets of the cognitive resource of mindfulness—*observing* and *nonreactivity to inner experience*. These results provide further support for the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001), which posits that recurrent experiences of positive emotions ultimately “build” a variety of beneficial personal resources. Finally, we discovered that these changes in mindfulness were meaningfully related to changes in flourishing symptoms over time. Specifically, positive changes in mindfulness appeared to predict positive changes in signs of flourishing during the course of the study. The data thus suggest that the broaden-and-build theory of positive emotions outlines the mechanisms through which flourishers achieve and maintain optimal mental health: Flourishers experience greater positive emotional reactivity when engaged in day-to-day pleasant activities, which forecasts higher levels of key mindfulness facets that support mental health maintenance and enhancement. Although testing this idea goes beyond the scope of the current paper, we further speculate that the positive changes we observed in flourishing would forecast the degree to which participants show positive emotional reactivity in the future. In sum, the overall pattern of results provides evidence for positive-potential processes consistent with the broaden-and-build theory.

A key strength of these findings is that they emerged as a result of a detailed examination of daily life nested within a prospective design. The Day Reconstruction Method is unique given the quantity and quality of information it provides about the content and emotional experiences of an individual’s day—a Tuesday in the summer of 2007—that participants were unaware would be later documented. The content of participants’ episodes reflected the mundane (e.g., “taking a shower and getting dressed,” “driving home”) to the unique (e.g., “at a dermatologist getting sunspots

zapped with a laser,” “participated in National Night Out activities”). And for each episode, we collected detailed information about the activities in which they engaged and the emotions they experienced. From this rich and extensive catalogue of information, the answer to our first hypothesis emerged. Although everyone experienced more positive emotions when engaging in activities such as interacting or playing, mental health status was integral to predicting how large that “boost” would be.

The current findings also offer critical insight into the precise ways in which flourishers experience more positive emotions during their everyday lives. Our preliminary results showed that, on average, flourishers experienced more positive emotions during all of their episodes. These differences serve to validate the diagnosis of flourishing. Our results, however, suggest that these *level* differences do not tell the entire story. Flourishers also exhibit heightened positive emotional reactivity in response to key pleasant events, a set of findings that goes beyond merely validating the diagnosis of flourishing and instead provides novel information that the flourishing measure does not predict.

Although our results for Hypothesis 1 align with past work showing that happy people, relative to unhappy people, report feeling higher levels of happiness when reflecting on past events they identify as “positive” (Lyubomirsky & Tucker, 1998), our findings expand on those earlier results in important and novel ways. First, our work offers *specificity* about the nature of the events from which flourishers derive more positive emotions. For instance, when interacting, flourishers experience bigger “boosts” of positive emotions, but not when exercising. Second, the current study reveals the *everydayness* of the positive emotional reactivity that flourishers exhibit. In past research (Lyubomirsky & Tucker, 1998), the events were distinctive (e.g., getting an A+ on a test, getting engaged), not routine. Third, our findings confirm that

positive emotional reactivity is present for individuals who are high on a constellation of well-being indicators (e.g., self-acceptance, environmental mastery), not only emotional well-being (i.e., happiness). Finally, our study provides an additional comparison group not present in previous research: depressed individuals. By also including a group of depressed individuals, we were able to provide a more complete portrayal of how mental health and mental illness differentially affect positive emotional responses.

Importantly, our results cannot be explained by trait differences in extraversion or behavioral activation sensitivity (BAS), both features of approach temperament (Elliot & Thrash, 2010). Although we obtain the classic finding that extraversion and BAS predict higher level differences in positive emotions, no similar cross-level interactions emerged for extraversion or behavioral activation sensitivity. So, like extraverts and people high in BAS, flourishers experience more positive emotions across their whole day, but unlike extraverts and people high in BAS, flourishers also show greater positive emotional reactivity to certain circumstances.

Our findings also underscore the importance of conceptualizing well-being in terms of two dimensions, instead of one—a conclusion at which other researchers have also arrived (e.g., Keyes, 2007; for a contrary view, see Huppert, 2009). The positive emotional experiences of flourishers were markedly different than those of non-flourishers. Implementing the traditional conceptualization of well-being, as the absence of mental illness, would have “lumped” these two groups together and obscured these consequential distinctions. Interestingly, the current results also suggest that non-flourishers and depressed individuals do not differ as much as one may imagine. This is surprising, given that two groups “should” have been quite different, according to the traditional conceptualization of well-being and mental illness. Instead, with respect to positive emotionality, flourishers appear to stand apart from the other two groups. In sum, using new methods and outcomes, the current paper supports the claim that well-being is best conceptualized as a complete state (Keyes, 2007), comprising both the absence of psychopathology and the presence of positive functioning and positive emotions.

In addition, the results provide more evidence regarding the importance of mindfulness, in particular, the facets of *observing* and *nonreactivity to inner experience* for optimal mental health. We speculate that these two facets of mindfulness may be particularly susceptible to the effects of positive emotionality. For instance, the *observing* facet refers to the extent to which one is attentive to the one’s internal and external surroundings (e.g., “I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow”), an orientation toward the world that may be facilitated by a broadened outlook. The *nonreactivity to inner experience* facet of mindfulness similarly reflects a broadened or more flexible approach to the happenings of life (e.g., “When I have distressing thoughts or images, I ‘step back’ and am aware of the thought or image without getting taken over by it”) akin to the concept of broad-minded coping (Fredrickson & Joiner, 2002). In contrast, other facets of mindfulness may not be as responsive to variations in positive emotionality and its associated broadened cognition.

Why might flourishing be associated with greater positive emotional reactivity to pleasant, everyday activities? Considering the

various ways that positive emotions broaden cognition (for a review, see Cohn & Fredrickson, 2009), we speculate that a flourishing state of mental health may prompt an expansive cognitive orientation, with relaxed inhibitory control (Rowe et al., 2007), characterized by greater receptivity or “openness” toward the positive elements of typical, pleasant activities. As such, flourishing may allow individuals to better capitalize on pleasant events in their lives. In addition, flourishers may engage in pleasant activities, like interacting with another, more successfully than other groups. Flourishing is characterized by feelings of competence, a positive attitude toward the self, and the belief that one has something to contribute. As such, flourishers may themselves be more effective conversationalists, for instance, and thus create more enjoyable interactions with others. These same characteristics may promote more rewarding experiences of the other target activities as well, such as *learning* or *helping*, although, these speculations merit empirical test.

An unexpected aspect of the current findings is that the positive emotional reactivity effects for *exercising* did not appear to follow the same pattern as the other activities. Further, when probing the effects, we discovered that depressed individuals did not show the classic positive emotional “boost” when exercising. A distinguishing feature of exercising, in comparison with the other activities, may be that the positive emotional boosts are mostly driven by physiological processes, whereas the others likely are not (although *playing* may refer to activities ranging from playing soccer to knitting a scarf). As such, we speculate that the processes by which the emotional effects of exercising become elevated might not be so amenable to change.

Limitations and Future Directions

A limitation of the current study is that although our claims were theoretically grounded, we did not experimentally manipulate the variables of interest. As such, we acknowledge the possibility that third variables may be operating. Consider the link between positive emotional reactivity and higher mindfulness facets, for instance. Perhaps it is the case that less stress in one’s life causes one to experience more positive emotional reactivity and also produces higher mindfulness in the future. Because of the nature of our overarching research question, the use of an experimental design may have been inappropriate, however. The purpose of this study was to understand how a social psychological variable—positive emotional reactivity—might be the mechanism flourishers access on a daily basis, wittingly or unwittingly, to sustain their mental health. To test this idea, we used a method that allowed us to capture a day in the life of flourishers, non-flourishers, and depressed individuals, and then recontacted these individuals later to assess any changes in their mental health.

Another limitation of the current study is that the results may have been vulnerable to response bias. That is, participants prone to report positive things about themselves on the flourishing measures may have also been likely to report positive things about themselves on other assessments, like their positive emotional experiences during activities like helping. We argue that response bias is unlikely to explain our results, however, because if a rosy glow effect was present it would have solely produced *level* differences in positive emotionality, as opposed to *slope* differences in positive emotional reactivity. That is, the positive emotion

reports would have been elevated indiscriminately, rather than elevated only in response to certain activities.

Another potential limitation of using the DRM in the present study is that it may have exploited differences in how well the three groups—flourishers, non-flourishers, depressed people—accurately remembered their own past experiences. Because positive emotions have been shown to enhance recall of peripheral details within autobiographical events (Talarico, Bernstein, & Rubin, 2009), flourishers may be better able to remember peripheral details from the previous day, thereby making their emotion reports—positive and negative—more accurate. Again, however, these potential differences in memory ability would not explain the slope differences in positive emotionality that emerged, although they may have influenced level differences in positive emotions.

Another limitation of the study was the somewhat homogenous nature of the sample. For example, the majority of the sample were white (84%), middle-class, and middle-aged. Future work might investigate the days in the lives of participants at different points of the life span and with more varied ethnic, cultural, and socioeconomic backgrounds to examine whether the effects of flourishing remain the same.

Future research might also examine the degree to which individuals from different categories of mental health spend more or less time engaging in the targeted activities. Although our empirical test of this idea may be low in power, descriptively, we noticed that flourishers, relative to non-flourishers and depressed people, reported spending larger proportions of their days engaging in all six of the pleasant activities, a trend that may well reflect the greater intrinsic rewards they reap.

In addition, future research might examine the degree to which variation in flourishing reflects more of a dispositional characteristic (“between-person” difference) or a dynamic characteristic that fluctuates from one time point to the next within an individual (a “within-person” difference). That is, is flourishing more of a personality difference or a dynamic state of human existence that ebbs and flows? Research in which multiple assessments of flourishing symptoms take place over longer periods of time would be necessary to answer this important question.

Conclusion

The current paper suggests that flourishing may be fueled by small but consequential differences in individuals’ experiences of pleasant, everyday events, like conversing with a colleague or working on a jig-saw puzzle. These results might not have been discovered without the unique perspective provided by the DRM. The granularity of the data set allowed us to detect subtle but important differences in positive emotional responsivity, which in turn predicted significant, global differences in resources and well-being. Further, these results underscore the utility of the broaden-and-build theory of positive emotions for understanding the core processes by which well-being is promoted, and at the same time provide support for a positive potentiation perspective. Although flourishing may be an exceptional state of mental health with considerable benefits to self and society, the manner in which it is sustained may reside within the emotional experiences of ordinary, everyday events.

References

- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*, 27–45.
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56*, 893–897.
- Beck, A. T., Steer, R. A., & Garbin, M. G. (1988). Psychometric properties of the beck depression inventory: Twenty-five years of evaluation. *Clinical Psychology Review, 8*, 77–100.
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., . . . Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11*, 230–241.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*, 822–848.
- Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry, 18*, 211–237.
- Carmody, J., Baer, R. A., Lykins, E. L. B., & Olendzki, N. (2009). An empirical study of the mechanisms of mindfulness in a mindfulness-based stress reduction program. *Journal of Clinical Psychology, 65*, 613–626.
- Carson, J. W., Carson, K. M., Gil, K. M., & Baucom, D. H. (2004). Mindfulness-based relationship enhancement. *Behavior Therapy, 35*, 471–494.
- Coffey, K. A., Hartman, M., & Fredrickson, B. L. (2010). Deconstructing mindfulness and constructing mental health: Understanding mindfulness and its mechanisms of action. *Mindfulness, 1*, 235–253.
- Cohen, L. H., Gunther, K. C., Butler, A. C., O’Neill, S. C., & Tolpin, L. H. (2005). Daily affective reactivity as a prospective predictor of depressive symptoms. *Journal of Personality, 73*, 1687–1713.
- Cohn, M. A., & Fredrickson, B. L. (2009). Positive emotions. In Lopez, S. J. & Snyder, C. R. (Eds.), *Oxford handbook of positive psychology* (2nd ed., pp. 13–31). New York: Oxford University Press.
- Csikszentmihalyi, M. (1975). Play and intrinsic rewards. *Journal of Humanistic Psychology, 15*, 41–67.
- Dunn, E. W., Aknin, L. B., & Norton, M. I. (2008). Spending money on others promotes happiness. *Science, 319*, 1687–1688.
- Elliot, A. J., & Thrash, T. M. (2010). Approach and avoidance temperament as basic dimensions of personality. *Journal of Personality, 78*, 865–906.
- Evans, D. R., Baer, R. A., & Segerstrom, S. C. (2009). The effects of mindfulness and self-consciousness on persistence. *Personality and Individual Differences, 47*, 379–382.
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology, 2*, 300–319.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist, 56*, 218–226.
- Fredrickson, B. L. (2004). Gratitude, like other positive emotions, broadens and builds. In Emmons, R. A. & McCullough (Eds.), *The psychology of gratitude* (pp. 145–166). New York: Oxford University Press.
- Fredrickson, B. L., & Branigan, C. (2005). Positive emotions broaden the scope of attention and thought-action repertoires. *Cognition and Emotion, 19*, 313–332.
- Fredrickson, B. L., Cohn, M. A., Coffey, K. A., Pek, J., & Finkel, S. M. (2008). Open hearts build lives: Positive emotions, induced through loving-kindness meditation, build consequential personal resources. *Journal of Personality and Social Psychology, 95*, 1045–1062.
- Fredrickson, B. L., & Joiner, T. (2002). Positive emotions trigger upward spirals toward emotional well-being. *Psychological Science, 13*, 172–175.
- Fredrickson, B. L., Mancuso, R. A., Branigan, C., & Tugade, M. M.

- (2000). The undoing effect of positive emotions. *Motivation and Emotion*, 24, 237–258.
- Fredrickson, B. L., Tugade, M. M., Waugh, C. E., & Larkin, G. (2003). What good are positive emotions in crises? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001. *Journal of Personality and Social Psychology*, 84, 365–376.
- Huppert, F. (2009). A new approach to reducing disorder and improving well-being. *Perspectives on Psychological Science*, 4, 108–111.
- Kabacoff, R. I., Segal, D. L., Hersen, M., Van Hasselt, V. B. (1997). Psychometric properties and diagnostic utility of the beck anxiety inventory and the state-trait anxiety inventory with older adult psychiatric outpatients. *Journal of Anxiety Disorders*, 11, 33–47.
- Kahneman, D., & Krueger, A. B. (2006). Developments in the measurement of subjective well-being. *Journal of Economic Perspectives*, 20, 3–24.
- Kahneman, D., Krueger, A. B., Schkade, D. A., Schwarz, N., & Stone, A. A. (2004). A survey method for characterizing daily life experience: The day reconstruction method. *Science*, 306, 1776–1780.
- Kashdan, T. B., Rose, P., & Fincham, F. D. (2004). Curiosity and exploration: Facilitating positive subjective experiences and personal growth opportunities. *Journal of Personality Assessment*, 82, 291–305.
- Kashdan, T. B., & Steger, M. F. (2007). Curiosity and pathways to well-being and meaning in life: Traits, states, and everyday behaviors. *Motivation and Emotion*, 31, 159–173.
- Kessler, R. C., Andrews, G., Mroczek, D., Ustun, B., & Wittchen, H. (1998). The world health organization composite international diagnostic interview short-form (CIDI-SF). *International Journal of Methods in Psychiatric Research*, 7, 171–185.
- Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2009). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry*, 62, 617–627.
- Keyes, C. L. M. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior*, 43, 207–222.
- Keyes, C. L. M. (2005). Chronic physical conditions and aging: Is mental health a potential protective factor? *Ageing International*, 30, 88–104.
- Keyes, C. L. M. (2007). Promoting and protecting mental health as flourishing: A complementary strategy for improving national mental health. *American Psychologist*, 62, 95–108.
- Keyes, C. L. M. (2009). Brief description of the mental health continuum short form (MHC-SF). Retrieved from <http://www.sociology.emory.edu/ckeyes/>. [Online, retrieved January 15, 2010]
- Lewis, M., Alessandri, S. M., & Sullivan, M. W. (1990). Violation of expectancy, loss of control, and anger expressions in young infants. *Developmental Psychology*, 26, 745–751.
- Lyubomirsky, S., Sheldon, K. M., & Schkade, D. (2005). Pursuing happiness: The architecture of sustainable change. *Review of General Psychology*, 9, 111–131.
- Lyubomirsky, S., & Tucker, K. L. (1998). Implications of individual differences in subjective happiness for perceiving, interpreting, and thinking about life events. *Motivation and Emotion*, 22, 155–186.
- McIntyre, C. W., Watson, D., Clark, L. A., & Cross, S. A. (1991). The effect of induced social interaction on positive and negative affect. *Bulletin of the Psychonomic Society*, 29, 67–70.
- Morris, B. H., Bylsma, L. M., & Rottenberg, J. (2009). Does emotion predict the course of major depressive disorder? A review of prospective studies. *British Journal of Clinical Psychology*, 48, 255–273.
- O'Neill, S. C., Cohen, L. H., Tolpin, L. H., & Gunthert, K. C. (2004). Affective reactivity to daily interpersonal stressors as a prospective predictor of depressive symptoms. *Journal of Social and Clinical Psychology*, 23, 172–194.
- Payton, A. R. (2009). Mental health, mental illness, and psychological distress: Same continuum or distinct phenomena? *Journal of Health and Social Behavior*, 50, 213–227.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Thousand Oaks: Sage.
- Reed, J., & Ones, D. S. (2006). The effect of acute aerobic exercise on positive activated affect: A meta-analysis. *Psychology of Sport and Exercise*, 7, 477–514.
- Rowe, G., Hirsh, J. B., & Anderson, A. K. (2007). Positive affect increases the breadth of attentional selection. *Proceedings of the National Academy of Sciences, USA*, 104, 383–388.
- Schmitz, T. W., De Rosa, E., & Anderson, A. K. (2009). Opposing influences of affective state valence on visual cortical encoding. *The Journal of Neuroscience*, 29, 7199–7207.
- Srivastava, S. I., Angelo, K. M., & Vallerieux, S. R. (2008). Extraversion and positive affect: A day reconstruction study of person-environment interactions. *Journal of Research in Personality*, 42, 1613–1618.
- Sroufe, L. A., & Waters, E. (1976). The ontogenesis of smiling and laughter: A perspective on the organization of development in infancy. *Psychological Review*, 83, 173–189.
- Talarico, J. M., Bernstein, D., & Rubin, D. C. Positive emotions enhance recall of peripheral details. *Cognition and Emotion*, 23, 380–398.
- Tugade, M. M., & Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology*, 86, 320–333.
- Wadlinger, H. A., & Isaacowitz, D. M. (2006). Positive mood broadens visual attention to positive stimuli. *Motivation and Emotion*, 30, 89–101.
- Walters, E. E., Kessler, R. C., Nelson, C. B., Mroczek, D. Scoring the World Health Organization's Composite International Diagnostic Interview Short Form (CIDI-SF). Revised December 2002. Retrieved from: <http://www3.who.int/cidi/CIDISFScoringMemo12-03-02.pdf>. Accessed January 15, 2007.

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