

MICRODEVELOPMENT OF DAILY WELL-BEING THROUGH MENTAL IMAGERY PRACTICE

ULAS KAPLAN, Ed.D.
University of Groningen

GERALD N. EPSTEIN, M.D.
American Institute for Mental Imagery, New York

ANNE SULLIVAN SMITH, Ph.D., R.N.
Madonna University

ABSTRACT

In this study, we present a qualitative approach to changes in daily well-being as a function of mental imagery practice. Each morning for a period of 1 week, participants practiced a brief (approximately 1- to 2-minute long) mental imagery practice designed to facilitate well-being. Upon completing each exercise, they provided brief written reflections on their well-being. Qualitative analysis of these subjective reports revealed significant patterns that correspond to three of the four major components of well-being (positive affect, vitality, negative affect) examined by researchers from a Self-Determination Theory perspective. All participants reported immediate well-being benefits of mental imagery practice, and these benefits reflected several patterns that we identified. As these changes take place in seconds and minutes, this study reflects a microdevelopmental approach to well-being from a Dynamic Systems perspective. The value of exploring short-term imagery-related improvements in well-being in combination with long-term influences is discussed.

Imagination is an integral aspect of human consciousness (Epstein, 1989; Marks, 1999; Valentine, 1999) in ways that are closely connected with emotional experience (Kaplan & Epstein, 2012). Images can reflect and manifest psychological and physiological states in consciousness. Valentine (1999) stressed that individuals' verbal reports of their own imagination such as vividness of imagery (Marks, 1999) are significant aspects of their conscious experience, and hence can accurately reflect the conditions of their health as well as physical and psychological states and performance. As a central function of imagination, mental imagery has a distinctive capacity to evoke and sustain emotions (Holmes & Mathews, 2005, 2010). Mental imagery can alter human experience in a desired direction (Sheikh, 2003).

The therapeutic practice of mental imagery is the process by which the mind discovers the inner forms called images that represent desired states of being (Epstein, 1989; Kaplan & Epstein, 2012). The therapeutic benefits of mental imagery have been explored and documented extensively (Gagan, 1984; Sheikh, 2003; Stopa 2009). These included physiological benefits such as improvement in physical relaxation and lessening of pain (Gagan, 1984), reduction in physical symptoms in various conditions such as cancer (Goodwin, Lee, Puig, & Sherrard, 2005) and asthma (Epstein, Barrett, Halper, Seriff, Phillips, & Lowenstein, 1997; Epstein, Halper, Barrett, Birdsall, McGee, Barron, et al., 2004), as well as psychological gains such as healing depression (Gilbert, 2009) and improvement of overall well-being (Watanabe, Fukuda, & Shirakawa, 2005).

On the other hand, immediate benefits of mental imagery on daily well-being have not received direct attention and in-depth exploration. In particular, the mental imagery literature is missing detailed qualitative analyses centered on the way individuals perceive and verbally report changes in their well-being. Likewise, the positive psychology and happiness studies literature on well-being does not involve qualitative explorations of possible mental imagery benefits. Such a research direction focusing on immediate changes in daily well-being can reveal some of the most direct, effective, and readily available applications and benefits of mental imagery. Thus, the present study aims to make a contribution by focusing directly on the way participants perceive and report immediate changes in their well-being as a result of mental imagery practice. This will be achieved by analyzing written reflections from participants immediately after they practice a particular imagery exercise.

Daily Well-Being

The study of daily well-being is seen as the study of short-term fluctuations in people's well-being (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). These fluctuations could be from one day to the next, or one setting to another throughout the same day. Short-term emotional benefits of mental imagery practice are worth exploring, not only to discover patterns of immediate improvements in well-being,

but to understand possible building blocks for *enduring* health and adaptation benefits.

In the present study, we explored the effects of a week-long imagery practice on the well-being of college students as reflected in their qualitative self-reports. In particular, we were interested in identifying quick shifts in emotional experience that participants observed in themselves as functions of a particular imagery exercise. This is significant in understanding well-being because the prevalence of positive or pleasant emotional experience is an important quality of subjective well-being (Diener, 1984; Seligman, 2002, 2011).

Another fundamental quality of subjective well-being that our approach represents is the expression of participants' subjective inner experience. Still, it is important to note that our approach to well-being in the present article does not "include a global assessment of all aspects of a person's life" (Diener, 1984, p. 544). An example of such a global assessment would be satisfaction with life, which was identified as a defining quality of subjective well-being. On the other hand, as Schueller and Seligman (2010) clarified, well-being "is more than just satisfaction with life. Instead, researchers often combine both assessments of affective states as well as cognitive evaluations to develop a more nuanced view of an individual's well-being" (Keyes & Magyar-Moe, 2003, p. 253). Our focus on affective states reflects the promise and potential of mental imagery practice to create significant shifts in well-being quickly, in a matter of seconds and minutes. From a Dynamic Systems (DS) perspective, such changes that occur in a short-term scale are characterized as *microdevelopment* (Lewis & Douglas, 1998; Thelen & Smith, 2006; van Geert & Steenbeek, 2005).

A Microdevelopmental Approach

Our focus on identifying immediate changes in well-being reflects *microdevelopment* as "the process of change in abilities, knowledge and understanding during short time spans" (Granott & Parziale, 2002, p. 1). The possibility of quick improvements in psychological well-being reflects *emotional microdevelopment* (Granott & Parziale, 2002, p. 1). Long-term trajectories of well-being as explored by Busseri, Choma, and Sadava (2012) can be seen as its *macrodevelopment* (Lewis & Douglas, 1998).

According to our emphasis on microdevelopment, the process of mental imagery is both developmental and therapeutic. As Thelen (2005) put it: "therapeutic intervention itself is a developmental process" (p. 258). In this context, we explore how imagery can both reflect and improve well-being as a therapeutic and a developmental intervention. While emotions and cognitions have been examined in microdevelopmental studies, changes in well-being have not been explicitly explored as aspects of a microdevelopmental process. The present approach is a step toward connecting these two areas of research (microdevelopment and well-being) more strongly.

According to the DS perspective, short-term (micro-level) and long-term (macro-level) development are likely to have unique and distinctive characteristics. Therefore, experiences in these two time scales must be differentiated. On the other hand, they are also interconnected. Thus, micro-level changes can both simulate and serve as building blocks of macro-level changes. Consistently, the quality and the frequency of daily experiences of major components of well-being such as positive emotion, engagement, and meaning can be seen as building blocks for and major contributors to individuals' overall life satisfaction and well-being (Schueller & Seligman, 2010; Seligman, 2002, 2011).

Our micro-level approach (based on momentary shifts and perceptions) does not fit the classical definitions and conceptions of subjective well-being (based on global evaluations). Still, our approach is an exploration of possible changes in some of the building blocks of well-being. In the present study, we were particularly interested in identifying patterns in individuals' verbal reports regarding possible improvements in positive affect and reduction in negative affect (Busseri & Sadava, 2011). A previous qualitative study (Epstein et al., 1997) about the well-being effects of imagery on asthma patients revealed findings in this direction. These findings were promising for the development of the present study in which we carry out a qualitative analysis of free reflections (written reports) to identify immediate well-being effects in a normal college sample.

According to our approach, patterns of immediate or short-term changes in well-being are important as indicators of individuals' overall adaptation. Consistently, from a Self-Determination Theory (SDT) perspective, Reis et al. (2000) emphasized: "Emotional well-being is most typically studied in trait or traitlike terms, yet a growing literature indicates that daily (within person) fluctuations in emotional well-being may be equally important" (p. 419).

People's daily well-being is shaped by significant well-being related experiences that occur over seconds, minutes, and hours. Consistently, the DS perspective places special emphasis on examining micro-level changes in human development (Lewis & Douglas, 1998; Thelen & Smith, 2006; van Geert & Steenbeek 2005). Likewise, detailed exploration of micro-level changes in subjective well-being can make significant contributions to our understanding of the short-term dynamics of well-being. In this context, focusing on how individuals perceive and express micro-level changes can be particularly insightful. This approach can shed light on the process by which well-being can be improved through interventions such as mental imagery.

As Lewis and Douglas (1998) characterized microdevelopment from a DS perspective, changes "over seconds or minutes constitutes self-organization in real-time" (Thelen & Ulrich, 1991, p. 163). Likewise, van Geert and Steenbeek (2005) emphasized the value of studying "short-term time scales of concrete

action” (p. 422). Consistent with Piaget’s (1987) emphasis on the interconnectedness between mental operations and concrete action, mental imagery represents specific actions carried out in the mind within a microdevelopmental time scale.

Mental Imagery and Well-Being

Individuals can engage in a process of expressing and understanding their imaginal language and symbolism. This can be an important facilitator for the therapeutic effects of mental imagery (Epstein, 2007; Hall, Hall, Stradling, & Young, 2006). In this process, various emotional, cognitive, and motivational mechanisms may be dynamically interconnected in the service of improving adaptation. For example, Gilbert (2009) argued that *compassion-focused imagery* “arises from the interaction of a variety of evolved motivational, emotional and cognitive systems,” and can be effective in healing depression by simulating “a particular type of affect regulation system (a soothing system) that is linked to social affiliation, care and well-being” (p. 206). Similarly, in discussing the benefits for psychotherapy and the nursing practice, Gagan (1984) stressed the capacity of imagery in improving physical and psychological well-being by promoting relaxation.

In light of these insights, the present qualitative study builds on our previous (quantitative) work (Kaplan & Epstein, 2012) in which mental imagery practice enhanced psychophysiological coherence immediately, over a period of seconds and minutes. In that study we also observed gains in baseline coherence throughout a 3-week period, even though this longer-term impact was much more limited. Self-regulatory practices that induce positive emotions increase psychophysiological coherence, which is a healthy and dynamic state of balance within and between psychological and physiological systems of the organism (McCraty, Atkinson, Tomasino, & Bradley, 2009; McCraty & Tomasino, 2006). As a state of resilience, psychophysiological coherence is associated with “increased order, efficiency, and harmony in the functioning of the body’s systems” (McCraty & Childre, 2010, p. 12).

In the present study, participants learned and practiced, for a period of 8 days, a mental imagery exercise that focused on increasing coherence within the body. The present article only focuses on participants’ subjective verbal reports immediately following the imagery exercise. Therefore, physiological assessment of coherence is not included here. On the other hand, we expect aspects of perceived psychophysiological coherence to be represented in written reflections in ways that may be attributed to the imagery practice. Overall, our purpose was to explore the effects of mental imagery practice in creating possible microdevelopmental changes in daily well-being as reflected in participants’ verbal descriptions. Hence, we focused on identifying patterns of influence across participants’ written verbal reports.

Research Question

In light of these insights, our main research question was the following: Which aspects of daily well-being emerge as a function of mental imagery practice in ways that are perceived by individuals and reflected in their verbal descriptions? In other words, what types of short-term (microdevelopmental) subjective well-being changes are likely to be experienced and observed by individuals in relation to mental imagery practice? We addressed this question by identifying common patterns in participants' written reflections. These reflections were about the mental and emotional states they experienced and perceived during and immediately following a brief imagery exercise.

METHOD

Participants

A total of 37 college students (14 males, 23 females) from a university in the eastern United States participated in the study. Students were from two different psychology courses. Participants were mixed in terms of their majors and standing in college. Approximately half of the sample were junior or senior psychology majors (from one of the courses), and the other half were mostly freshmen with a wide range of majors. Participation in the study was an option for students as partial fulfillment of their course requirements. Another option was available, and students were free to choose which to take. It was also made clear to participants that they have the option of withdrawing throughout the study, and switching to the other option. Participation in the study had benefits for students to learn mental imagery practice as a practical tool for enhancing well-being.

Procedure

Research Design

The experiment started with a training session when participants visited a lab to learn the fundamentals of mental imagery practice, including posture and breathing. Each participant was trained individually by a psychiatrist who is an expert in mental imagery. This training occurred on the first day of the study. During the training, participants practiced an imagery exercise called the blue light exercise, which was developed by Dr. Gerald Epstein from the American Institute for Mental Imagery, and used at a previous research study (Kaplan & Epstein, 2012). This training session made sure that participants were able to carry out mental imagery as a personal practice. At the end of this training, participants were instructed to repeat the imagery exercise each morning shortly after they woke up for the next 7 days. The exercise can be completed within 1 or 2 minutes, with some natural interpersonal variation based on how long it takes each individual to experience each step. This exercise is presented in Table 1.

Table 1. The Mental Imagery Exercise Used in the Study,
Created by Dr. Gerald Epstein

Blue Light Exercise

Close your eyes.

Breathe out and in three times slowly.

Breathe in blue-golden light formed by a mixture of cloudless blue sky and bright golden sun.

Breathe out grey smoke like cigarette smoke, seeing it disappear in the air.

See this blue light coming out of your heart and flowing through your arterial system starting with the great vessels (aorta) into the middle-sized vessels to the lesser vessels, into the capillaries enriching all the blood cells filling them with blue light. Know your immune system is strong and healthy.

Breathe out and open your eyes.

This exercise was appropriate for the present study because it was designed to improve general well-being without explicit verbal instructions regarding psychological aspects of well-being. The exercise and its instructions were designed to represent and trigger vivid images. These images and instructions explicitly focused on the body and physiological processes, rather than psychological experiences. In other words, the instructions for imagery did not involve direct representations or instructions about the psychological focus of our well-being investigation. Still, it involved positive images that we believed were vivid and strong enough to influence both physiological and psychological processes. We believe that these characteristics of the exercise make the emerging perceptions and verbal reflections about psychological aspects more authentic. In other words, as a result of this particular exercise choice, participants' perceptions and verbal reflections were less likely to be confounded by verbal instructions and expectations, and more likely to be representations of what they really experienced in imagery.

Following the practice of the blue light exercise each morning, participants submitted online brief reflections of their experiences, including how they felt during and after the exercise. The instruction for these reflections was simply that participants were asked to write "a couple of sentences, describing your experience (feelings, thoughts, etc.) during and after the exercise." Thus, each participant was asked to write a total of seven brief reflections, one for each practice, shortly after completing it each morning. These reflections constitute the qualitative data analyzed in order to explore the effects of mental imagery practice on subjective well-being.

Analytical Procedure

Participants' reflections from each of the seven mornings during and immediately after the imagery exercise were compiled for qualitative analysis. Crabtree

and Miller (1999) identified three styles for analyzing qualitative data: (a) template, (b) editing, (c) immersion/crystallization. The editing analyzer's style was chosen as most appropriate for our approach and purpose in this study.

According to the template style, researchers approach the data through a coding template. The template involves codes, which are expected from the data, and subject to revision as analysis unfolds. Immersion/crystallization style involves in-depth examination of a selected portion of the data (immersion) and reflection on this examination in order to identify the most representative patterns (crystallization). This process is repeated until the entire data is analyzed. According to the editing style, the researcher "enters the text much like an editor searching for meaningful segments" (Crabtree & Miller, 1999, p. 21); and "searches for meaningful units or segments of the text that both stand on their own and relate to the purpose of the study" (Crabtree & Miller, 1999, p. 23). As a result, "these units are sorted and organized into categories or codes" to be "explored for patterns and themes" (Crabtree & Miller, 1999, p. 23).

Accordingly, we searched for meaningful segments in the data, categorized the elements of interest, and identified patterns and structures connecting the themes derived. The focus of our study on subjective intrapsychic experiences and perceptions increased the compatibility of the editing style with our general approach as well as specific research questions. The editing style was used by two researchers who analyzed the data and identified the themes in collaboration with each other.

RESULTS

The thematic analysis using the editing style (Crabtree & Miller, 1999) yielded eight major themes. The first three themes represented participants' self-perceptions throughout and shortly after the exercise (perceptions category). The second set of themes, 4 through 6, were based on the visual aspect of participants' imagery experience (visualizations category). Themes 7 and 8 formed a third category (contextualizations) that represented a meta-cognitive process by which the participants were reflecting on the imagery practice itself (rather than only their sensations and perceptions within it). Hence, participants made sense of the imagery practice in the context of their daily motivations (theme 7), and challenges (theme 8). These eight themes and their corresponding three categories are presented in Table 2.

Perceptions

The first set of three themes reflected individual responses to the imagery experience. The most common descriptors were clustered in three patterns: relaxed and calm, focused and alert, and stress reduced and settled down.

Table 2. The Eight Themes and the Three Corresponding Categories that Represent Common Responses by Participants as They Reflected on the Effects of Their Mental Imagery Practice

General categories	Themes
A. Perceptions	1. Relaxed and calm 2. Focused and alert 3. Stress reduced and settled down
B. Visualizations	4. Color and light 5. Function of breathing 6. Images of the heart
C. Contextualizations	7. Motivational meaning of imagery practice 8. Challenges and suggestions

Theme 1: Relaxed and Calm

Relaxation was a universal experience of all of the individuals; some reported relaxation as a daily experience, some less frequently. They used terms that represent similar experiences: relaxed, refreshed, relieved, calm, and content. The word relaxed was used a total of 110 times, and the word calm emerged a total of 82 times in participants’ descriptions of their states during and following the exercise.

Theme 2: Focused, Alert, and Energized

Participants frequently recorded perceptions of a *heightened awareness* and energy after completing the exercise. They described this experience using terms such as energetic, focused, awake, and alert. One person noted feeling euphoric. Others referenced feelings of being composed and centered. While these descriptions were not expressed by all, they were noted frequently by many participants over the 7 days. As part of this theme, while being alert, awake, focused, composed, and energized were many times emphasized together, alert and awake were most frequently used: alert emerged 19 times and awake emerged 20 times in participant’s descriptions of their own psychological states during and following the imagery exercise.

Theme 3: Stress Reduced and Settled Down

Occasionally, individuals described feelings of being less stressed, being settled down, rested, and breathing more easily. This theme is parallel to the first theme

(relaxed and calm). However, because participants felt the need to emphasize their states as a reduction of negative feelings (such as stress, tension, and anxiety), this theme emerged as being phenomenologically distinct, while appearing to describe a very similar end state (positive state of being relaxed and calm) to what is represented by Theme 1. Sometimes these expressions were linked with descriptions of visualizations, the second set of themes.

Visualizations

The second set of response patterns highlighted the experience of visualizations prompted by the imagery experience. This category represents the visual component of the imagery process. Participants' reports corresponding to this category described concepts of light and color, visions of smoke as linked to breathing in and out, and heart patterns of pace and intensity.

Theme 4: Color and Light

The most frequent descriptions regarding visualizations focused on color and light. Some shared cogent and complex experiences, others more subdued impressions linked to difficulty in achieving vivid images. These experiences also indicated the uniqueness of each participant's imagination. One individual described seeing orange light when s/he had expected blue.

Theme 5: Function of Breathing

According to the second most frequent set of narratives identified within the visualizations category, participants recognized and emphasized the therapeutic function of their exhalations and inhalations. In this context, participants saw and sensed breathing in the "good" and out the "bad"; inhaling the positive and exhaling the negative.

Theme 6: Images of the Heart

Some participants described images of the heart, many fast paced, beating strongly. One recalled the image of the heart presented on a handout in the training session for use as the imagery experience during the week.

Contextualizations

As part of our qualitative data, we observed that participants provided useful and meaningful reflections on the imagery practice itself. This third set of themes were identified in our analysis as the process by which participants were making sense of the imagery practice in the practical reality of their everyday lives. Participants were putting the imagery practice into the context of their lives. We identified two patterns under contextualizations: an emerging and increasing

motivation for practicing the exercise (Theme 7), and challenges and related suggestions for improvement (Theme 8).

Theme 7: Motivational Meaning of Imagery Practice

One notable pattern was a repeated reference to the exercise as a “good way to start the day.” This reflected the possibility that the imagery exercise became an integral part of starting the day, and a meaningful aspect of their daily motivation. Some individuals stated that they would continue doing the exercise beyond the study, particularly when they were feeling stressed. Some planned to make it a part of their daily routine. One person noted s/he was motivated to continue when she realized that s/he had incorporated the exercise into a dream experience. Another mentioned that s/he initially struggled but was optimistic of better results ahead.

Theme 8: Challenges and Suggestions

An eighth theme emerged in terms of difficulties or challenges that some participants experienced regarding the daily practice. This final theme includes participants’ suggestions for making the imagery practice more efficient and effective for them. Several participants described personal barriers to completing the exercise successfully. There was a repeated request for an oral/auditory vehicle to guide the participants through the imagery experience beyond the initial training session in the lab. Some individuals had difficulty remembering the elements of the exercise details during the first couple of days. Environmental and personal distractions led to frustrations in achieving optimum participation. In particular, fatigue, stresses of student life, exams, assignments due, and roommate issues were emphasized. Also, extraneous noises were hard for some to block out.

Others noted time preferences. Some found it difficult to complete the exercise in the morning, with the rush to classes and exams. Diurnal patterns interfered; some stated they wanted to do the exercise in the afternoon. One participant disliked the fact that the exercise made her too relaxed in the morning when she wanted to become more driven.

Table 3 presents two examples from participants’ reflections that correspond to each theme.

DISCUSSION

Mental Imagery and Microdevelopment of Well-Being

In this study, we explored changes in college students’ well-being as reflected in their subjective evaluations throughout a week as they practiced mental imagery. In the process of addressing our research question, we found significant patterns of well-being changes as clearly observed and described by many participants

Table 3. Two Samples of Each Theme from Participants' Reports

Themes	Examples
1. Relaxed and calm	<p>After the activity I felt more relaxed than ever.</p> <p>Felt a deep state of relaxation and calmness.</p>
2. Focused, alert, and energized	<p>I felt myself becoming more focused and awake.</p> <p>After this morning's imagery exercise I felt very euphoric and highly energetic.</p>
3. Stress reduced and settled down	<p>Doing the exercise made me feel as I was relieving stress from homework and test, which was nice.</p> <p>I woke up feeling agitated and frustrated but after the exercise I felt a little more in control of myself and a little more optimistic about the rest of the day. It definitely seems to help control anxiety.</p>
4. Color and light	<p>During the imagery exercise this morning I was able to more clearly see an image of a heart that was blue and gold and see the heart pumping out more gold light. I feel as though the images are getting more clear in my mind.</p> <p>It was easy to imagine the grey smoke leaving my body with each exhalation, but I had a hard time imagining the oxygen coming in as a blue light. But what's interesting is that I could still see an orange light coming from my heart instead of blue today, which is the only light I could imagine coursing through my body.</p>
5. Function of breathing	<p>I felt relaxed and could still imagine myself exhaling waste and taking in pure oxygen.</p> <p>Doing the breathing exercise I feel much, much more composed and centered. Could still easily see myself breathing out all of the impurities in my body, but I don't feel as good as I usually do after doing this exercise.</p>
6. Images of the heart	<p>It was the first time I felt my heart beating as strongly and could tell it was healthy as the blue light surrounded my whole body.</p> <p>It is getting increasingly easier for me to imagine my heart pumping blue light into every inch of my body and to imagine breathing out all the impurities of my body.</p>

Table 3. (Cont'd.)

Themes	Examples
7. Motivational meaning of imagery practice	<p>As I continue the exercise I realize that I am more alert and awake for my classes in the morning. I am ready to start the day and feel great.</p> <p>When I woke up this morning after I did the exercise I felt healthy and ready to start the day. I also felt wide awake.</p>
8. Challenges and suggestions	<p>I feel calm, but during the exercise all I could think about was my exam today, so it was rather difficult to concentrate.</p> <p>Today it was surprisingly difficult to get myself to see the images. As on each day I have felt really good after doing the task, I just really had a hard time seeing anything. It is a whole bunch easier when you have someone with an orator's voice reading you what you're supposed to be looking for. I did feel warm again afterwards, and felt well rested. I just could not get myself to really buy into the mental imagery this morning.</p>

regarding their inner states. Based on these self-descriptions, we identified eight themes that correspond to three categories (perceptions, visualizations, and contextualizations). Through these themes, participants seemed to make sense of the imagery experience and its connection to well-being.

The fact that strong and clear well-being themes emerged from the data when there was no explicit verbal instruction or question about well-being is noteworthy. Such a spontaneous emergence can be attributed to inherent connections between mental imagery and well-being. Well-being increases that are revealed by participants' verbal descriptions were experienced and observed in seconds or minutes. Thus, our findings reflect microdevelopmental changes in daily well-being.

According to Theme 1, participants reported increased relaxation and calmness. This parallels Theme 3 about a perceived reduction in stress and a feeling of being settled down, emotionally and physiologically. While Theme 1 represents the perception of increase in a pleasant inner state, Theme 3 is about reduction in an aversive state. These two themes correspond to two fundamental components of well-being (Busseri & Sadava, 2011; Diener, 1984), namely, positive affect and negative affect. The first and third themes can also be seen as different manifestations of Seligman's first factor, *positive emotion*. The first theme (relaxed and calm) directly represents a positive emotional state of relaxation,

while the third theme reflects a positive state through perceived reduction of negative emotional states such as stress, tension, and anxiety.

Subjective well-being is commonly understood through subjective assessments of individuals' inner states, similar to the process that our participants experienced. However, because our approach did not involve and was not based on a global evaluation of life satisfaction, participants' reports do not represent subjective well-being as it has been typically conceptualized and measured. An important quality of our approach to well-being is emphasis on direct and subjective reports regarding the quality of inner experience, instead of meeting standard conditions of life-satisfaction.

Biologically, Theme 1 and Theme 3 are consistent with the promise of mental imagery to improve relaxation (Gagan, 1984). In this context, it is significant that Theme 1 and Theme 3 correspond to the parasympathetic and sympathetic functioning of the autonomic nervous system respectively. Theme 1 can be seen as indicating an increase in parasympathetic nervous system activity (which regulates resting and relaxation of the organism), and Theme 3 more directly represents a reduction of excessive sympathetic nervous system activity (which regulates excitation of the organism and mobilizing its resources).

The other theme we identified as part of participants' perceptions was Theme 2, which combines feelings of increased alertness, clarity, focus, awareness, and energy. This theme can be seen as a natural consequence of the experiences identified in themes 1 and 3. That is, with reduced stress and increased relaxation and calmness, there is more energy, awareness, and alertness in the organism as perceived by participants as a result of the blue light exercise. Our finding on heightened awareness is consistent with previous findings of greater body awareness associated with mindfulness meditation, and increased awareness of mental images associated with waking dream practice (Brown, Forte, Rich, & Epstein, 1983).

Theme 2 is also highly compatible with the *flow* experience that was identified by Csikszentmihalyi (1990) as a state of optimal functioning characterized by increased alertness, awareness, and efficient use of energy. Similarly, the second theme reflects some of the key psychological qualities corresponding to high *engagement*, the second factor in Seligman's (2011) PERMA model (positive emotion, engagement, relationships, meaning, accomplishment) of well-being. According to Seligman (2011), "engagement, is about flow: being one with the music, time stopping, and the loss of self-consciousness during an absorbing activity" (p. 11). From this perspective, the blue light activity itself can be as the *absorbing activity* that facilitated flow or engagement, a state that involves *concentrated attention* (Seligman, 2011, p. 11). This is what we observed in our participants. As one participant noted:

Performed the exercise and felt extremely tired after waking up early to review for a test. However, with 2 minutes of the exercise I felt more alert and

centered. I felt rather chaotic when I woke up (very tired, confused) but the exercise had a calming effect that left me feeling more alert.

Another participant described a very similar shift in well-being:

Being sick has thrown off my groove, so I woke up late today and felt anxious. After doing the breathing exercise I feel much much more composed and centered. I wasn't expecting it to have such an effect on me.

Moreover, our finding reveals the promise of mental imagery to quickly create some of the key psychological conditions for flow and engagement (such as heightened alertness and attention) in relation to other activities that individuals may become occupied with throughout the day. In other words, based on our finding, it is reasonable to infer that with effective mental imagery practice, individuals are more likely to “meet the world in flow” (Seligman, 2011, p. 11).

It is important to note that the first three themes of enhanced well-being emerged spontaneously in many participants' verbal descriptions without any references to phrases such as *change* or *well-being* as part of the instruction for written reflections. As described in the method section, the prompt was simply to describe their experiences during and after the exercise. Given this general instruction that aimed to elicit free reflections of what is most salient to participants' subjective inner states, the emergence and prevalence of major components of enhanced well-being are additionally noteworthy and significant. In other words, major themes reflecting enhanced well-being were frequently emphasized by participants in their free reflections in the absence of any guidance or suggestions regarding well-being changes. In this context, the findings regarding well-being are increasingly striking, considering the fact that the imagery exercise itself did not contain any reference to psychological well-being themes either.

The spontaneously frequent occurrence of well-being themes can be seen as supporting the validity of our main finding of our qualitative analysis that mental imagery practice improves daily well-being. The lack of explicit prompts for psychological well-being forms a useful contrast with the frequent and common emergence of well-being themes among many participants. This combination strongly increases the validity of the following assertion we make as an inference from our analysis: the reported well-being changes were authentic experiences in response to imagery, rather than mere functions of suggestion, expectations, or social desirability.

When the first three themes are combined, participants' perceptions of their own biological, mental, and emotional states characterize a relatively sophisticated process of improved wellness. This process involves reduced stress, increased relaxation, as well as enhanced awareness, alertness, and energy. This combination represents the process or state of psychophysiological coherence (McCraty & Childre, 2010), under which the organism experiences a “shift in autonomic balance toward increased parasympathetic activity” (p. 13). According to the Institute of Heartmath (McCraty et al., 2009), psychophysiological coherence is

associated with sustained positive emotion and increased self-regulation by the organism. It represents a significant reduction of tension as well as an optimal mode of functioning in which biological, mental, and emotional systems are in balance. As a result, increased coherence was found to be associated with increased well-being and performance in a range of areas (Ginsberg, Berry, & Powell, 2010; McCraty et al., 2009, McCraty & Childre, 2010).

While the present article does not include objective biological measurement of coherence, this inference is highly consistent with objectively measured quantitative increases in psychophysiological coherence we found in a previous study (Kaplan & Epstein, 2012) as a function of two different imagery practices. One of those practices was the blue light exercise that we used in the present study.

Common Visual Representations in the Imagery Process

Three additional themes were identified in a separate category called *visualizations*. These themes were about visual representations in the imaginal experience of participants that had different meanings and functions. In this context, it is important to note that our methodology and findings reflect our conception of mental imagery as an overarching imaginal process that includes and transcends any particular sensation such as vision. In other words, the complexity and uniqueness of the imagery process is not to be reduced to vision, but may include other sensations as integral parts of an individual's creative imagination. Visualizations emerge as one category of the imagery process we explore in this study.

Responses that emphasized colors and light were clustered under Theme 4. This theme appeared to facilitate the healing role of images by improving the vividness of the whole experience. For example, one participant wrote: "It has gotten easier to do with each practice. I could visualize the blue light surrounding my body with positive things." A different participant reported that as she inhales the pure blue light, "the sun comes out and everything seems more warm and happy." Similarly, another participant reported: "This time I was really able to see the blue light coming out from my heart, and felt as though it was filling around my whole body." Such comments revealed that the effectiveness and the personal meaning of the exercise were improved by vividness of color and light. This is consistent with the emphasis and findings of many studies using the *Vividness of Visual Imagery Questionnaire* (Marks, 1999).

Within the visualizations category, two additional themes were identified (5 and 6) and were particularly informative in terms of subjective well-being. In the process of carrying out the exercise, some participants sensed increased wellness to be represented by their heart and its functioning, which we identified as Theme 6. For example, one participant reported that it was the first time that "I felt my heart beating as strongly and could tell it was healthy as the blue light

surrounded my whole body.” Another wrote: “It is getting increasingly easier for me to imagine my heart pumping blue light into every inch of my body and to imagine breathing out all the impurities of my body.”

This report also represents an element of Theme 5, according to which participants’ images of their breathing reflected positive changes that facilitated a sense of wellness. Their self-reports in this category often represented a *cathartic* function of the breathing component in the exercise. That is, the exhalation of impurities and inhalation of empowering energy were frequent points of reference in ways that appeared highly meaningful and motivating. The imaginal reality was described by participants in ways that appeared as authentic and real as concrete physical reality. For example, one participant reported “I feel good as I imagine waste products relieving from my body. Because I keep imagining that I’m taking in good, I feel better.” Another participant wrote “I imagined the horizon as I was breathing to be more pure from the rain and it gave me the motivation I need to start my day.”

Motivational Significance: Connections with Self-Determination Theory

These comments also represent Theme 7, according to which the imagery exercise became a motivating factor for participants to start the day. Theme 7 resonates with Gilbert’s (2009) emphasis on the motivational component of compassion-focused imagery. The blue-light exercise can be seen as a process by which individuals provide compassion toward themselves. Participants put the imagery exercise in a *positive light* in the context of their day. To the extent that the exercise became personally meaningful, Theme 7 reflects the operation of *identified regulation* according to SDT (Deci & Ryan, 1985, 2000). Identified regulation represents a relatively high degree of internalization. This pattern reflects a shift from *external regulation* (doing the exercise for obtaining rewards or avoiding punishment) or *introjected regulation* (pleasing others, avoiding guilt) toward an increasingly internalized motivation. Other evidence regarding internalized motivation comes from reports about continuing to practice the exercise other times throughout their day and willingness to practice beyond the 7-day period.

Participants’ improvements in self-regulation may be partly due to increases in autonomy and competence (as two of the three basic needs emphasized by SDT) as facilitated by the blue-light exercise. Once participants learned the exercise, they had a simple and effective tool for experiencing an enhanced state of well-being. This reflects both autonomy and competence as increased mastery of their own functioning and adaptation. This postulation is consistent with the findings of Reis et al. (2000) from a SDT perspective: “Higher levels of autonomy and competence were associated with more favorable outcomes on all four measures of well-being” (p. 429).

The four measures of well-being studied by Reis et al. (2000) were positive affect, vitality, negative affect, and symptoms. While our qualitative approach did not include a standardized measurement of well-being, three of these components (positive affect, vitality, negative affect) emerged as part of common themes we identified based on self-reports. The first three themes we identified correspond directly to these three components of well-being. *Positive affect* was reflected across the first seven themes, but most directly represented by Theme 1 (relaxed and calm). Theme 2 (focused, alert, and energized) represents increased vitality, and Theme 3 (stress reduced and settled down) reduction in *negative affect*. This overlap between our findings with the majority of the well-being components from the SDT perspective is additionally significant because our methodology and analysis developed and occurred independently of these conceptions.

Subjective Well-Being as a Dynamic System Interconnected with Imagination

From a DS perspective, development is *iterative* (Lichtwarck-Aschoff, van Geert, Bosma, & Kunnen, 2008; Steenbeek & van Geert, 2008; Thelen & Smith, 2006; van Geert, 2003; van Geert & Steenbeek, 2005). That is, each new state of the system is dependent on and emerges by building on its earlier state. In our data, relatively frequent references to how participants felt prior to the intervention (imagery exercise) each morning is consistent with the importance of the beginning quality (initial levels) of participants' well-being. In most cases, participants reported that their initial well-being state was significantly altered and enhanced during and after the brief imagery exercise. In this process, the imagery exercise is a new stimulus that becomes part of the dynamic system of one's imagination. Further, our study provides support for the notion that imagination is interconnected with the dynamic system of one's well-being.

In DS terms, the mental imagery exercise was a *perturbation* to the dynamic system of well-being. This perturbation triggered a developmental reorganization in the well-being system. This reorganization occurred step-by-step in ways that were both unique to each individual and also similar across individuals. The iterative nature of change is likely to be a common denominator, contributing to the emergence of common themes. Each step of the blue light exercise can be seen as one iteration. Mental and emotional experiences of a new iteration emerge by building on those of the earlier iteration. Such a pattern of sequential and recursive influences based on the steps of the blue-light exercise was particularly evident in the set of themes that emerged as *Visualizations* in our qualitative analysis.

Enhanced well-being states that we documented can be seen as emergent properties in real-time interaction between dynamically interconnected components or systems (Lewis & Douglas, 1998). In this process, imagination and well-being are dynamically related. That is, they interact by influencing the

emergence of each other's next state: new states of imagination emerge, building on the earlier state of imagination in a way that is influenced by the earlier state of well-being. Likewise, new states of well-being emerge building on earlier states of well-being, but also building on the impact of earlier states of imagination. Enhanced well-being is not a fixed, rigid, or static state; rather, it is subject to continuous influences. The third category of themes that emerged in our qualitative analysis (Contextualizations) is a direct indication of this reality. Participants not only reported enhanced well-being, but also situated this development in a dynamic context of multiple environmental influences. This supports the notion that subjective well-being is subject to a dynamic process of idiosyncratic daily influences even after it is significantly enhanced through imagery practice.

From a DS perspective, context is also dynamic (Steenbeek & van Geert, 2008) rather than static. That is, the environmental context that influences the system is itself subject to change over time, and subject to idiosyncratic changes based on the individual's unique experiences and developmental trajectory. These DS properties are reflected in content of the Contextualizations category, which contained participants' verbal descriptions of dynamic influences.

Limitations and Conclusion

One of the limitations of our study concerns our qualitative analysis. Our procedure can be significantly improved and strengthened with a more systematic and objective approach. The identification of themes and/or matching participants' descriptions with the themes can be carried out separately by different evaluators, and quantitative measures of inter-rater reliability may be obtained. This is an important step for future research to improve this new research program and substantiate the findings more strongly.

Taking into account Theme 8 (challenges and suggestions), future studies can expand this work by introducing some changes in design. For example, participants can be divided into two groups, one of which may be given an audio recording of the imagery exercise to be listened to each morning throughout the exercise. Their results can be compared to the other group participants who do not have an audio guideline (the condition of the present study). The frequency of practice can be another variable as participants can do the exercise when they feel stressed during the day and/or at night in addition to each morning. Further, different imagery exercises with variations in the imagined components may be used in order to evaluate the effectiveness of various contents. Future studies can also build on the present study by controlling for existing levels of subjective well-being. This could help illuminate whether interpersonal differences in subjective well-being affect the influence of mental imagery.

While our major focus in this study was microdevelopmental of daily well-being, the short-term changes we have identified can be seen as possible building blocks of long-term increases in subjective well-being (macrodevelopment). Such an *interconnectedness of developmental time scales* (Lewis 1995; Lewis & Douglas, 1998; van Geert & Steenbeek, 2005) is a dynamic developmental insight that is compatible with our approach. This interconnectedness has been emphasized in the DS literature as *nested time scales* (Smith & Thelen, 2003, p. 343; Thelen & Smith, 2006, p. 277). In our study, participants reported the continuation of enhanced well-being beyond the brief period of time they practiced imagery in the morning. This is one of the possibilities of connection between microdevelopmental and macrodevelopmental changes in well-being. It would also be useful for future studies to examine microdevelopment more strongly and systematically by documenting iterative changes in well-being.

In discussing their exploration of temporal trajectories of subjective well-being, Busseri, Choma, and Sadava (2012) emphasized the value of extending the assessment period (beyond their existing time-span of 1-year). Likewise, we suggest longer time periods as an extension of our study so that future studies can include assessments of change through mental imagery practice in both micro- and macro-developmental time scales. Expanding the assessment period could help overcome a major limitation of the present study (being limited to a period of 1-week). As a result, it would be possible to examine and explicate more strongly the potential of mental imagery to enhance both short-term and long-term well-being.

In this study, we have identified major themes that represent shifts in subjective well-being as individuals verbally made sense of their imagination through the blue-light exercise. The study confirms the premise and promise of mental imagery as an efficient and effective tool in improving well-being. Our study also affirms the value of paying attention to the process by which a standard imagery exercise may be discovered in individuals' minds. Thus, it has practical implications for rapidly increasing daily well-being. Future studies that focus on practical daily experiences that enhance well-being can build on the present study. As Schueller and Seligman (2010) suggested:

Focusing on what people do to promote their wellbeing is an important area of research. Behavioral strategies are major determinants of individual differences in happiness (Tkach & Lyubomirsky, 2006). Consequently, these behaviors provide an important point of intervention for increasing happiness. (Lyubomirsky, Sheldon, & Schkade, 2005, p. 261)

How people utilize their imagination can be closely connected to their daily well-being. By gaining further insight into the connections between mental imagery and well-being, researchers can make significant contributions to understanding. This can also help researchers to develop more effective interventions.

Within the uniqueness of individuals' imagination and consciousness, the common themes of well-being that emerged in our study reflect the universality of mental imagery as the shared inner language of the mind (Epstein, 1981, 1989) that is interconnected with human emotion (Holmes & Matthews, 2005, 2010). How people use this inner language can have profound implications on their well-being in ways that can be experienced and perceived in consciousness almost immediately, as participants described in our study.

REFERENCES

- Brown, D., Forte, M., Rich, P., & Epstein, G. (1983). Phenomenological differences among self hypnosis, mindfulness meditation, and imaging. *Imagination, Cognition and Personality, 2*(4), 291-309. doi: 10.2190/JWC1-AXLY-6R0L-G2NK
- Busseri, M. A., Choma, B. L., & Sadava, S. W. (2012). Subjective temporal trajectories for subjective well-being. *Journal of Positive Psychology, 7*(1), 1-15. doi: 10.1080/17439760.2011.565784
- Busseri, M. A., & Sadava, S. W. (2011). A review of the tripartite structure of subjective well-being, implications for conceptualization, operationalization, and synthesis. *Personality and Social Psychology Review, 15*(3), 290-314. doi: 10.1177/1088868310391271
- Crabtree, B. F., & Miller, W. L. (Eds.). (1999). *Doing qualitative research* (2nd ed.). Thousand Oaks, CA: Sage.
- Csikszentmihalyi, M. (1990). *Flow. The psychology of optimal experience*. New York, NY: Harper & Row Publishers, Inc.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York, NY: Plenum.
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 319-338. doi: 10.1207/S15327965PLI1104_01
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*(3), 542-575. doi: 10.1037/0033-2909.125.2.276
- Epstein, G. N. (1981). *Waking dream therapy. Dream process as imagination*. New York, NY: Human Sciences Press. (1997, New York, NY: ACMI Press).
- Epstein, G. N. (1989). *Healing visualizations*. New York, NY: Bantam Books.
- Epstein, G. N. (2007). *The phoenix process: One minute a day to health, longevity & well being* (Audio Set). Niles, IL: Nightingale-Conant.
- Epstein, G. N., Barret, E. A. M., Halper, J. P., Seriff, N. S., Phillips, K., & Lowenstein, S. (1997). Alleviating asthma with mental imagery. A phenomenological approach. *Alternative and Complementary Therapies, 3*(1), 42-52.
- Epstein, G. N., Halper, J. P., Barrett, E. A. M., Birdsall, C., McGee, M., Barron, K. P., et al. (2004). A pilot study of mind-body changes in adults with asthma who practice mental imagery. *Alternative Therapies, 10*(4), 66-71.
- Gagan, J. M. (1984). Imagery: An overview with suggested application for nursing. *Perspectives in Psychiatric Care, 22*(2), 20-25. doi: 10.1111/j.1744-6163.1984.tb00199.x

- Gilbert, P. (2009). Evolved minds and compassion-focused imagery in depression. Imagery and the threatened self: Perspectives on mental imagery and the self in cognitive therapy. In L. Stopa (Ed.), *Imagery and the threatened self: Perspective on mental imagery and the self in cognitive therapy* (pp. 206-231). New York, NY: Routledge/Taylor & Francis Group.
- Ginsberg, J. P., Berry, M. E., & Powell, D. A. (2010). Cardiac coherence and PTSD in combat veterans. *Alternative Therapies in Health and Medicine*, 16(4), 52-60.
- Goodwin, L. K., Lee, S. M., Puig, A. I., & Sherrard, P. A. D. (2005). Guided imagery and relaxation for women with early stage breast cancer. *Journal of Creativity in Mental Health*, 1(2), 53-66.
- Granott, N., & Parziale, J. (2002). *Microdevelopment. Transition process in development and learning*. Cambridge, UK: Cambridge University Press.
- Hall, E., Hall, C., Stradling, P., & Young, D. (2006). *Guided imagery: Creative interventions in counseling & psychotherapy*. Thousand Oaks, CA: Sage.
- Holmes, E. A., & Mathews, A. (2005). Mental imagery and emotion: A special relationship? *Emotion*, 5(4), 489-497.
- Holmes, E. A., & Mathews, A. (2010). Mental imagery in emotion and emotional disorders. *Clinical Psychology Review*, 30(3), 349-362. doi: 10.1037/1528-3542.5.4.489
- Kaplan, U., & Epstein, G. (2012). Psychophysiological coherence as a function of mental imagery practice. *Imagination, Cognition and Personality*, 31(4), 297-312. doi: 10.2190/IC.31.4.d
- Keyes, C. L. M., & Magyar-Moe, J. L. (2003). The measurement and utility of adult subjective well-being. In S. J. Lopez & C. R. Snyder (Eds.), *Positive psychological assessment: A handbook of models and measures* (pp. 411-426). Washington, DC: American Psychological Association.
- Lewis, M. D. (1995). Cognition-emotion feedback and the self-organization of developmental paths. *Human Development*, 38(2), 71-102. doi: 10.1159/000278302
- Lewis, M. D., & Douglas, L. (1998). A dynamic systems approach to cognition-emotion interactions in development. In M. F. Mascolo & S. Griffin (Eds.), *What develops in emotional development?* (pp. 159-188). New York, NY: Plenum.
- Lichtwarck-Aschoff, A., van Geert, P., Bosma, H., & Kunnen, S. (2008). Time and identity: A framework for research and theory formation. *Developmental Review*, 28(3), 370-400. doi: <http://dx.doi.org/10.1016/j.dr.2008.04.001>
- Lyubomirsky, S., Sheldon, K. M., & Schkade, D. (2005). Pursuing happiness: The architecture of sustainable change. *Review of General Psychology*, 9, 111-131. doi: 10.1037/1089-2680.9.2.111
- Marks, D. F. (1999). Consciousness, mental imagery and action. *British Journal of Psychology*, 90, 567-585. doi: 10.1348/000712699161639
- McCraty, R., Atkinson, M., Tomasino, D., & Bradley, R. T. (2009). The coherent heart. Heart-brain interactions, psychophysiological coherence, and the emergence of system-wide order. *Integral Review*, 5(2), 10-115.
- McCraty, R., & Childre, D. (2010). Coherence: Bridging personal, social and global health. *Alternative Therapies in Health and Medicine*, 16(4), 10-24.
- McCraty, R., & Tomasino, D. (2006). Emotional stress, positive emotions, and psychophysiological coherence. In B. B. Arnetz & R. Ekman (Eds.), *Stress in health and disease* (pp. 342-365). Weinheim, Germany: Wiley-VCH.

- Miller, W. L., & Crabtree, B. F. (1999). Clinical research: A multimethod typology and qualitative roadmap. In B. F. Crabtree & W. L. Miller (Eds.), *Doing qualitative research* (2nd ed.; pp. 3-30). Newbury Park, CA: Sage.
- Piaget, J. (1987). *Possibility and necessity*. Minneapolis, MN: University of Minnesota Press.
- Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin*, *26*, 419-435. doi: 10.1177/0146167200266002
- Schueller, S. M., & Seligman, M. E. P. (2010). Pursuit of pleasure, engagement, and meaning: Relationships to subjective and objective measures of well-being. *Journal of Positive Psychology*, *5*(4), 253-263. doi: 10.1080/17439761003794130
- Seligman, M. E. P. (2002). *Authentic happiness. Using the new positive psychology to realize your potential for lasting fulfillment*. New York, NY: Free Press.
- Seligman, M. E. P. (2011). *Flourish. A visionary new understanding of happiness and well-being*. New York, NY: Free Press.
- Sheikh, A. A. (Ed.). (2003). *Healing images. The role of imagination in health*. Amityville, NY: Baywood.
- Smith, L. B., & Thelen, E. (2003). Development as a dynamic system. *Trends in Cognitive Sciences*, *7*, 343-348.
- Steenbeek, H., & van Geert, P. (2008). The empirical validation of a dynamic systems model of interaction. Do children of different sociometric statuses differ in their dyadic play interactions. *Developmental Science*, *11*(2), 253-281. doi: 10.1111/j.1467-7687.2007.00655.x
- Stopa, L. (Ed.). (2009). *Imagery and the threatened self: Perspectives on mental imagery and the self in cognitive therapy*. New York, NY: Routledge/Taylor & Francis Group.
- Thelen, E. (2005). Dynamic systems theory and the complexity of change. *Psychoanalytic Dialogues*, *15*(2), 255-283. doi: 10.1080/10481881509348831
- Thelen, E., & Smith, L. B. (2006). Dynamic systems theories. In W. Damon & R. Lerner (Eds.), *Handbook of child psychology, Vol. 1: Theoretical models of human development* (6th ed., pp. 258-312). Hoboken, NJ: John Wiley & Sons.
- Thelen, E., & Ulrich, B. D. (1991). Hidden skills: A dynamical systems analysis of treadmill stepping during the first year. *Monographs of the Society for Research in Child Development*, *56*(223), 104. doi: 10.2307/1166099
- Tkach, C., & Lyubomirsky, S. (2006). How do people pursue happiness? Relating personality, happiness-increasing strategies, and well-being. *Journal of Happiness Studies*, *7*, 183-225. doi: 10.1007/s10902-005-4754-1
- Valentine, E. R. (1999). The possibility of a science of experience: An examination of the conceptual problems facing the study of consciousness. *British Journal of Psychology*, *90*, 535-542. doi: 10.1348/000712699161611
- van Geert, P. (2003). Dynamic systems approaches and modeling of developmental processes. In J. Valsiner & K. J. Conolly (Eds.), *Handbook of developmental psychology* (pp. 640-672). London, UK: Sage.
- van Geert, P., & Steenbeek, H. (2005). Explaining after by before: Basic aspects of a dynamic systems approach to the study of development. *Developmental Review*, *25*, 408-442. doi: <http://dx.doi.org/10.1016/j.dr.2005.10.003>

Watanabe, E., Fukuda, S., & Shirakawa, T. (2005). Effects among healthy subjects of the duration of regularly practicing a guided imagery program. *BMC Complementary and Alternative Medicine*, 5(21). doi: 10.1186/1472-6882-5-21

Direct reprint requests to:

Ulas Kaplan
University of Groningen
Department of Developmental Psychology
Grote Kruisstraat 2/1
Groningen, 9712 TS, Netherlands
e-mail: ukaplan11@gmail.com