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Consciousness and Unconsciousness in Clinical and Educational Psychology Through the Lens of Mindfulness

Yoshinori SUGIURA
(HIROSHIMA UNIVERSITY)

In the present review, the role of consciousness (controlled processes) in clinical and educational psychology is discussed, using the construct of mindfulness. Mindfulness is a mode of attention characterized by receptive and nonjudgmental awareness of the experience of the present moment. In clinical psychology, mindfulness has been found to reduce emotional distress by enhancing a detached stance toward difficult-to-control negative automatic thinking. In addition, detachment is supported by attentional control. Evidence from the educational field supporting a motivation-enhancing effect of mindfulness is also reviewed. Mindfulness can decouple the automatic tendency to reduce motivation and actual behavior. It enables people to derive satisfaction from ordinary daily life and to be empathic to other people. Future directions for empirical research, especially intervention studies, are discussed.

Key Words : consciousness, mindfulness, automatic process, detached attitudes, motivation

The period from 1990 to 2009 witnessed a renewed interest in the unconscious (Bargh & Morsella, 2008). This contemporary movement is distinct from the classical psychodynamic conceptualization. For example, it is based on firm empirical ground. Recent research has focused on the construct of automatic processing. The concept of automaticity has been expanded from simple perceptual or linguistic processes to more complex social activities. Automatic processes are defined by the following attributes: unintentional, effortless, difficult to control, and not requiring conscious awareness (Bargh & Morsella, 2008). Automatic processes are contrasted with controlled processes. The terms "automatic and controlled processes" are often used interchangeably with the terms "unconscious and conscious processes".

The trend to focus on unconsciousness and automaticity seems to contradict basic assumptions in educational psychology, which have emphasized concepts such as problem-solving, metacognition, and self-regulation. Clinical psychology also has been concerned with awareness and consciousness. In other words, researchers in practical psychology have valued conscious or controlled processes.

Why does unconsciousness now attract psychologists despite educational and clinical psychology's continuing emphasis on consciousness? One reason may be methodological. Professionals in psychology have been concerned with the contamination of data by social desirability and demand characteristics. If the process concerned were automatic and not amenable to conscious distortion, that would help us to be confident in the internal validity of the results. Shimojo (1999) suggested that automatic processes are attractive partly because they are convenient for scientific investigation. In contrast, psychologists have found it difficult to conceptualize, measure, and manipulate constructs such as consciousness and volition.

However, without further examination, it is premature to trust the scientific advantage of automatic processing over controlled or conscious processing. Constructs as working memory, executive function, and prefrontal cortex help us operationalize consciousness with scientific rigor. In addition, there is growing interest in methods for training attentional control (a component of executive function) in order to enhance consciousness. These methods include meditation, video games, and interacting with nature (Lutz, Slagter, Dunne, & Davidson, 2008 ; Tang & Posner, 2009).

The present paper focuses on one of the methods for measuring and training consciousness that has increasingly been studied, mindfulness. The construct

of mindfulness was utilized to recapture the meaning of consciousness in clinical and educational psychology.

The term "mindfulness" can be used in two contexts. Although it is closely tied to a specific intervention, mindfulness meditation, it can also be considered to be a naturally occurring psychological experience, independent of any specific intervention (Brown & Ryan, 2003). In addition, there are individual differences in naturally occurring mindfulness (Brown & Ryan, 2003). Therefore, mindfulness can be both measured (state and trait) and manipulated. This is quite advantageous for research purposes.

Both intervention (experimental) and individual difference (correlational) studies are reviewed in the present paper. Although educational psychology covers wide range of psychological functioning, the present paper focus on issues related to motivation and self-regulation. The expected fruits may be a novel approach for treating difficult clinical problems, and alternative ways to motivate people and to enhance their well-being.

Automaticity, cognitive behavioral therapy, and mindfulness

Currently, cognitive behavioral therapy (CBT) is said to be the most influential psychotherapy method for various clinical disorders, with abundant empirical evidence for its efficacy. Cognitive behavioral therapy started with Beck's (1976) "discovery" of negative automatic thoughts, which are postulated to be the chief mediator of emotional distress. Cognitive behavioral therapy tries to ameliorate emotional distress (e.g., anxiety and depression) by intervening on distorted negative thoughts which pop automatically into people's consciousness (e.g., "I am a failure", "I am worthless").

These negative thoughts have two characteristics : automatic and negative. Which matters more? Several lines of research have indicated that it is the automaticity rather than the negativity that predicts psychopathology. Teasdale, Scott, Moore, Hayhurst, Pope, & Paykel (2001) found that the tendency to choose extreme points on self-rating scales, rather than the content of the particular items so rated, was predictive of a relapse of the individual's depression. Sheppard & Teasdale (2000) found that depressive patients were faster in endorsing maladaptive attitudes in questionnaires.

Further compelling evidence has come from studies using the Habit Index of Negative Thinking (HINT ; Verplanken, Friborg, Wang, Trafimow, & Woolf, 2007). The Habit Index of Negative Thinking has participants rate their negative thoughts on multiple dimensions. Ratings indicating perceived automaticity of negative thoughts (e.g., "I do automatically", "I do unintentionally") predicted the variance of self-esteem, anxiety, and depression independent of the negativity of the contents.

In addition, evidence has indicated that negativity in thinking is a relatively stable individual difference factor. Negative thought tendencies are determined by a temperament factor called "negative affectivity". Evidence indicates that negativity as indexed by the cognitive experimental (Teasdale & Dent, 1987) and psychophysiological methods (Henriques & Davidson, 1990) persists after recovery from depression. Therefore, the therapeutic aim is not to eliminate negative cognitions, but rather to reduce the influence of lasting negative thinking. Given the automatic nature of negative thoughts, it is important first to notice the influence of automatic thinking.

How can we reduce the impact of negative automatic thoughts? To answer this question, we should first elucidate the exact process that links negative thoughts and emotional distress. One classic, influential paper reported that, from time to time, most normal participants experience unpleasant and unwanted thoughts similar to those seen in clinical disorders (e.g., obsessive-compulsive disorder ; Rachman & de Silva, 1978). Therefore it is natural to expect that there is some process that mediates negative thoughts and clinical disorders. The mediators are thought to be people's habitual responses to negative thoughts. People tend to respond to negative thoughts with responses such as avoiding the trigger for such thoughts, dwelling on and on about the problem, and blaming oneself or others. These habitual responses further enhance emotional distress.

Such responses are a controlled process, at least more so than automatic thoughts. For example, people who are fearful of evaluation by others will avoid

interpersonal encounters by various means depending on the occasion. They will think of elaborate excuses so that they can decline attending a party, or choose a job with minimal contact with coworkers. However, their responses are automatic in that they almost invariably choose to avoid the possibility of being evaluated by others. The activation of a motive to avoid is lacking in deliberation.

Even if people may not be able to eliminate negative thinking, they may be able to alter their habitual response to it. However, to the extent that they are accustomed to making stereotyped responses, altering them requires some effort.

Mindfulness as a new form of cognitive behavioral therapy

New understanding of the etiology of and intervention for emotional disorders met the concept of mindfulness (Segal, Williams, & Teasdale, 2002 ; Teasdale, Segal, Williams, Ridgeway, Soulsby, & Lau, 2000). Mindfulness is defined as "paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 1994, p. 4). Mindfulness is usually cultivated through the practice of mindfulness meditation (Kabat-Zinn, 1994), in which participants are instructed to bring gentle awareness to their breathing, other physical sensations, and broader aspects of their experience (e.g., lights, sounds, and smells). The core of this meditation is to observe experiences as they are, not trying to change them, but just noticing them.

With repeated practice, one will be able to understand that even negative thoughts are just a part of fleeting experience, like a leaf floating on the river (Teasdale, Moore, Hayhurst, Pope, Williams, & Segal, 2002). Negative thoughts are no longer experienced as representing reality. Such detached awareness enables people not to be bothered by their negative thoughts so that they feel no need to cope with them any longer. Given the difficulty of deleting negative automatic thoughts, it is more realistic to just notice them and, at the same time, refrain from further processing of them (Wells, 2002). Noticing mental events as they are is the heart of mindfulness.

Attentional underpinning of mindfulness

Studies of mindfulness have revealed a curious hypothesis about the working mechanism of this and even other interventions. Mindfulness meditation requires active control of attention. The focus of attention (e.g., breathing or other bodily sensation) is usually weak and subtle. People are easily distracted during meditation, and their thoughts wander frequently. When they notice that they are distracted, they should gently guide their attention back to breathing.

This suggests the possibility that attentional control increases detachment from negative thoughts. Both correlational and clinical intervention studies support this hypothesis. First, Sugiura (2006) found that self-reported attentional control (sustained attention and divided attention) correlated positively with ability to refrain from catastrophic thinking (ability not to be involved with negative thoughts). This ability is characteristic of mindfulness. Second, training specifically intended to increase attentional control has symptom-reducing effects. Wells (1990) developed attention training using non-threatening external sounds as stimuli, in order to increase attentional flexibility. Because attention training does not focus on emotional material or one's inner experience (e.g., bodily sensations), it seems quite different from prototypical psychotherapies that are based on dialogue around distressing matters. However, a single use of attention training has been shown to be effective for depression, social phobia, and hypochondriasis (health anxiety). Siegle, Ghinassi, & Thase (2007) conducted attention training combined with the Paced Auditory Serial Addition Task (PASAT; Gronwall, 1977) for severely depressed patients, and observed symptom reduction. The Paced Auditory Serial Addition Task can be understood as an auditory version of the Uchida-Kraepelin Performance Test. Without printed stimuli (digits), participants must divide their cognitive resources between retention of the digits and the addition task. This is precisely a working memory task.

Siegle et al. (2007) also presented neuroimaging data indicating that, after treatment, there was increased prefrontal cortex activity during a difficult cognitive task coupled with reduced amygdala reactivity during emotion provocation. This brain pattern suggests increased attentional control (prefrontal cortex) and decreased emotional distress (amygdala).

Siegle et al.'s (2007) results are consistent with other basic research on emotion regulation. Neuroimaging data consistently indicate that the prefrontal cortex is

recruited in successful emotion regulation (Beauregard, Lévesque, & Bourgouin, 2001; Levesque & Pelletier, 2003; Ochsner, Ray, Cooper, Robertson, Chopra, Gabrieli, & Gross, 2004). This evidence synergistically indicates that attention control is at the core of symptom reduction (Sugiura, 2007).

Besides attention training or mindfulness, there are many other examples in which attention plays an important role, including focusing, autogenic training, and muscle relaxation. In addition to these attentional therapies, Mohlman & Gorman (2005) indicated that the effect of standard cognitive behavioral therapy may also be mediated by increased executive function. Therefore, it is possible that attentional control is important in various psychotherapies.

Further direct evidence comes from a joint factor analytic study by Sugiura (2006). Sugiura (2006) used scales tapping skills fostered in various psychological interventions, i.e., cognitive behavioral therapy, meditation, and focusing. In addition, related variables were also included from personality and stress coping research, i.e., self-reflection (adaptive self-focus, as distinguished from rumination) and detached coping. A joint factor analysis of these five scale items revealed five factors, not corresponding to the original five scales. Rather, three of five obtained factors contained items from multiple scales. For example, one factor named "detachment from negative thought" had items from cognitive behavioral therapy, meditation, and focusing. This factor was most strongly and negatively related to depression and worrying. Therefore, it was considered to be the most powerful therapeutic mediator. As mentioned above, this factor was related to self-reported attentional control. These results strongly suggest that attentional control underpins various forms of psychotherapy. In other words, these findings support the importance of consciousness in various psychological interventions.

Mindfulness improves quality of life

Mindfulness has opened new avenues for the amelioration of emotional distress. In addition, mindfulness has brought about further advantage for clinical intervention. As the term "emotional disorders" indicates, many clinical problems are characterized by distressing emotions (e.g., anger, anxiety, or sadness). However, what should not be overlooked is that these disorders have happiness-reducing effects. For example, depression is characterized by both enhanced negative emotion (sadness) and reduced positive emotion (anhedonia). In order to be formally diagnosed, psychological disorders must impair people's quality of life (American Psychiatric Association, 2000). Therefore, not only reducing negative emotions but also enhancing people's happiness is an important therapeutic goal (maybe a more important goal than simply the reduction of negative emotions) (Orsillo, Roemer, Lerner, & Tull, 2004).

Behavior activation (BA) is one of the intervention methods that can directly enhance well-being (Dimidjian, Hollon, Dobson, Schmaling, Kohlenberg, Addis, Gallop, McGlinchey, Markley, Gollan, Atkins, Dunner, & Jacobson, 2006). Behavior activation aims enable depressed patients to regain lost social functioning. For example, behavior activation targets very basic daily activities, such as waking up in the morning, having breakfast, and doing laundry. Depressed people are vulnerable to subtle difficulties in even such seemingly easy daily tasks. In the course of behavior activation, therapist and patients collaborate in carefully and systematically planning concrete daily activities.

Recent refinements in behavior activation emphasize awareness during activities (Martell, Addis, & Dimidjian, 2004). People can get reinforcement from even ordinary matters (e.g., cleaning rooms, preparing and having lunch). However, if people are preoccupied with something else (e.g., rumination), they cannot notice reinforcing stimuli in the environment. Mindful attitudes are expected to enhance awareness of potential reinforcers in the environment, and thus foster satisfaction derived from everyday behavior. The effectiveness of behavior activation was confirmed in large scale clinical trial (Dimidjian et al., 2006).

Behavior activation exemplifies the motivation-enhancing quality of mindfulness. Motivation-related topics will be taken up again below.

Automaticity and consciousness in complex social behavior

Complex automaticity

There are wide varieties in automaticity. As already mentioned, complex but habitual responses can be considered automatic responses. Studies by Bargh and his colleagues have revealed that auto-

matic processes are not confined to simple tasks like lexical decisions, but extend to more complex social behavior, like self-regulation (Bargh & Morsella, 2008). For example, Mauss, Cook, & Gross (2007) found that participants who had been primed with words related to emotion control (e.g., restrains, stable) showed reduced anger to anger provocation in the laboratory, relative to those who had been primed with emotion expression words (e.g., impulsively, volatile).

Automatic autonomy

Recent studies have revealed that automatic processes enable heightened autonomy, a construct that seems similar to automaticity but which has a very different meaning.

Self-Determination Theory. Before discussing automatic autonomy, some explanation about autonomy is necessary. This construct has been the chief theme of one of the most influential theories of human motivation, Self-Determination Theory (SDT ; Ryan & Deci, 2000). In Self-Determination Theory, "self-determination" is defined as choice or self-endorsement of a behavior. Various forms of motivation are considered to be aligned on a continuum of self-determination. Self-Determination Theory defines six levels on a continuum, from low to high self-determination: amotivation, extrinsic motivation (external regulation, introjected regulation, regulation through identification, and integrated regulation) and intrinsic motivation. The more self-determined a person's motivation is, the more persistence and well-being is expected. In addition, Self-Determination Theory postulates three fundamental basic needs whose satisfaction yields well-being : competence, autonomy, and relatedness.

Vansteenkiste, Simons, Lens, Sheldon, & Deci (2004) demonstrated that both intrinsic (vs. extrinsic) goals and autonomy-supportive (vs. controlling) contexts enhanced deep processing, performance, and persistence in tasks. Their studies repeatedly replicated this pattern in learning from texts in real classes (ecology and marketing) and sports in gym classes. Intrinsic vs. extrinsic goals were manipulated according to the learning material. For example, a topic about recycling was presented as useful for teaching young children (intrinsic value) or for saving money (extrinsic value). Autonomy vs. controlling contexts were manipulated by changing the wording of the instructions (e.g., by using "can" instead of "should" to enhance autonomy).

Autonomy and automaticity. One characteristic of automatic processes is uncontrollability. Extrinsic (controlled) motivation is, by definition, controlled by external factors. Therefore, automaticity and extrinsic motivation are similar in that both have less perceived agency. In contrast, controlled processes and autonomy both entail one's agency. In this regard, autonomy and automaticity seem antithetical.

Can autonomy be automatic? Evidence suggests that the answer is yes. Levesque & Pelletier (2003) primed words related to autonomy vs. control before the participants worked on crossword puzzles, and found an effect on intrinsic motivation and performance. They primed intrinsic/extrinsic motivation using the Scramble Sentence Test, including words like autonomy and interest for intrinsic motivation, and pressure and forced for extrinsic motivation. Extrinsic-primed participants found a later task less interesting and spend less time than intrinsic-primed participants. Ratelle, Baldwin, & Vallerand (2005) found that neutral stimuli paired with controlling properties had motivation-reducing effects (See review in Levesque, Copeland, & Sutcliffe, 2008).

Mindfulness as a moderator of automatic motivation

If autonomy can be automatically primed, where is there room for consciousness in self-regulation? Studies have found that mindfulness changes the person's relation to automatic processes. In other words, mindfulness moderates the effect of automaticity on behavior, well-being, and so on. In addition, as Levesque et al. (2008) argued, consciousness plays a role in the development of new habits.

Several studies have found that mindful people can overcome the influence of automatic processes. Ostafin & Marlatt (2008) presented evidence showing that mindfulness moderates the effects of automatic alcohol motivation on hazardous drinking. First, they demonstrated that Implicit Association Test (IAT) scores reflecting an association between alcohol and approach motivation predicted hazardous drinking among college students. The Implicit Association Test is popular among researchers interested in the automaticity of complex social behavior. The Implicit Association Test requires word-classification

(Greenwald, McGhee, & Schwartz, 1998). It combines classification of concepts (e.g., alcohol vs. water) and evaluation (e.g., positive vs. negative). Response buttons are arranged so that one button is used for both alcohol-related words and positive words. If a participant has faster response times on the "alcohol or positive" button than on the "alcohol or negative" button, that is interpreted as the participant having positive attitudes towards alcohol. Ostafin & Marlatt (2008) used approach vs. avoidance words instead of valence words to reflect motivation to alcohol. Second, non-judgmental acceptance moderated the relation between attitudes and behavior. Specifically, a relation between alcohol approach motivation and hazardous drinking was not found among high acceptance individuals. Curiously, acceptance *per se* was not related to measured alcohol motivation on the Implicit Association Test. Accepting people are not those who do not desire alcohol, but rather, they can decouple automatic desire and their actual drinking behavior.

Actual behavior is determined by both intention (effort invested) and routine habits (a type of automatic response). Chatzisarantis & Hagger (2007) found that highly mindful participants evidenced an enhanced relation between intention and behavior (doing sports for health), even after controlling for the effect of habits. Among low mindful participants, an intention to exercise did not predict actual behavior ; on the other hand, among high mindful people, a positive relation was found between intention and performance. In addition, Chatzisarantis & Hagger (2007) also found that mindfulness weakened the relation between maladaptive habits (binge-drinking) and health behavior. High mindful participants were free from the expected relation : binge-drinking reduced physical exercise.

Radel, Sarrazin, Legrain, & Gobancé (2009) found that mindfulness moderated motivational priming effects in a real class setting. They embedded words within class materials (slides), in order to prime autonomous or controlled motivation. Primed words were presented for a very short period (32 ms). The experiment was done during one class period (60 min). Students' scores on an exam at the end of the lesson served as the dependent variable. For those with low mindfulness, priming affected performance. Higher quiz scores were observed for the autonomous condition and lower for the controlled condition, which is consistent with the prediction from Self-Determination Theory. In contrast, more mindful people were not influenced by the priming operation.

Seen from another perspective, the Radel et al. (2009) results indicate that mindful people might not benefit from subliminally primed autonomous motivation. High vs. low mindful people seem to achieve autonomy via different mechanisms. Levesque & Brown (2007) provided results consistent with a differential pathway interpretation. They examined the effect of implicit autonomy attitudes (as measured by the Implicit Association Test) on daily autonomy (taken by experiential sampling three times per day for two weeks). A positive relation between implicit and actual autonomy was found only for low mindfulness participants. Among high mindfulness people, implicit attitudes and actual behavior were not related. On the other hand, daily autonomy and mindfulness were positively correlated. Therefore, mindfulness *per se* is thought to be autonomy enhancing. Some people actualize autonomy using conscious awareness, whereas others utilize unconscious attitudes.

Mindfulness, motivation, and well-being

The research reviewed up to this point has indicated that mindfulness can moderate effects of automatic motivation, although it has been demonstrated that automatic processes can also support autonomy. However, mindful people seem to actualize autonomy via a different mechanism. The discussion that follows will examine further the effect of mindfulness on motivation and well-being.

Motivating effect of mindfulness

Thus far, this review has indicated that evidence has demonstrated that mindfulness can moderate the influence of automatic responses. Automatic responses can be both adaptive and maladaptive. To the extent that mindfulness can moderate de-motivating automatic tendencies, it can enhance motivation.

Evans, Baer, & Segerstrom (2009) directly examined the effect of mindfulness on persistence on anagram tasks. Anagram tasks started with unsolvable ones in order to reduce participants' morale. Two aspects of mindfulness enhanced persistence, as measured by longer time engaged in the tasks: non-judgmental

attitudes and nonreactivity to inner experience. Considering the stressful nature of the task setting, nonjudgmental attitudes and nonreactivity enhanced persistence by decoupling task-induced distress and continuation of the task.

Masedo & Esteve (2007) examined pain-tolerance using a cold pressor task. The cold pressor task measures how long participants can keep their hand in cold water. Although the act of immersing one's hands in water seems to have no practical value in itself, it may provide an analogy for working in spite of pain. Masedo & Esteve (2007) found that a mindful stance enhanced tolerance for this task, compared to other strategies.

One de-motivating factor may be the tendency to simply label objects and go through them (e.g., simply saying, "it is a cake," and not further tasting its unique features). Mindfulness will also reduce such simple labeling tendencies. In line with this reasoning, Levy, Jennings, & Langer (2001) found that having participants discover several novel differences in objects in which they were originally not interested enhanced the memory of and liking for these objects. This result is interpreted as indicating that by discovering the novel differences, the participants became free from their preconceptions ("I do not prefer it") and any associated responses (e.g., quitting further observation).

Discovering new distinctions is Langer's (2000) definition of mindfulness. Seeing objects in a novel way is also consistent with mindful observation. Sansone, Wiebe, & Morgan (1999) distinguished two motivational processes that may lead to persistence at uninteresting tasks: an original reason for starting and a strategy for enhancing interest. Mindfulness may serve for the latter purpose.

In sum, mindfulness can enhance motivation via two pathways: reducing discouragement from distress during the task and enhancing intrinsic interest in objects.

Mindfulness and life-satisfaction

The next section of this article aims to demonstrate whether mindfulness can lead to enhanced satisfaction in real life, outside of the laboratory.

One example that indicates that mindful people are not bothered by external factors was reported by Brown, Kasser, Ryan, Linley, & Orzech (2009), who demonstrated that mindfulness predicted decreased financial desire discrepancies (the perceived gap between one's actual income and one's desired income). This finding held even when controlling for actual income. In addition, decreased financial desire discrepancies partially mediated the relation between mindfulness and subjective well-being. Although the precise mechanism linking mindfulness and reduced desire discrepancies is unknown, awareness may make it possible to derive more value from one's actual surroundings, thus reducing dependence on external stimulation (money). Alternatively, detached attitudes may enhance acceptance of one's current circumstances. In addition, mindfulness immunizes people to external motivating messages. For example, mindful people may not be influenced by advertisements stimulating desire for expensive goods.

In a similar vain, Brown & Kasser (2005) found that intrinsic value orientation and mindfulness explained the observed positive relation between subjective well-being and ecologically responsible behavior. Naively, the two seem antithetical. In order to engage in ecologically responsible behavior, one has to resign from material satisfaction, which may interfere with subjective well-being. However, the evidence shows that there is a positive correlation between the two, indicating that they are compatible. Further, mindfulness at least partly explains such an unexpected positive relation. Mindful people may not depend on consumption for their happiness and may not be influenced by messages urging people to consume. In addition, they may be more aware of the impact of their behavior on the environment.

Self-determination prevents ego-depletion, so might mindfulness

The present article has reviewed wide-ranging examples of the desirable effect of mindfulness. However, automatic processes can also yield autonomy and other adaptive characteristics that have been associated with conscious processing. On the other hand, mindfulness can moderate the undesirable as well as desirable effects (e.g., automatic autonomy) of automatic processes. Therefore, it seems difficult to argue the relative advantage of automatic vs. controlled processing.

However, one possible pitfall of conscious processes

is that they consume more psychological resources than automatic processes. In addition, conscious moderation may have some undesirable effect: mindful people cannot benefit from automatic motivation that does not require mental effort. Stated differently, mindful people can achieve a high level of autonomous motivation, but at much more cost. Is being mindful costly and exhaustive?

Recent evidence indicates that self-determined regulation does not cause ego-depletion. Ego-depletion is demonstrated by experiments in which engaging in self-control (e.g., resisting temptation or inhibiting impulses) results in diminished control later (e.g., Baumeister, Bratslavsky, Muraven, & Tice, 1998). However, Ryan & Deci (2008) reviewed evidence suggesting that autonomous self-regulation does not cause such effects. For example, Nix, Ryan, Manly, & Deci (1999) found that a task led to reduced vitality [a self-regulation resource, which Ryan & Deci (2008) consider to be a construct compatible with ego resources] when delivered by external control, but not in a self-directed condition. Even more striking, when basic needs according to Self-Determination Theory are met, vitality increases.

This evidence indicates that Self-Determinal self-regulation does not exhaust psychological resources. Studies about ego-depletion based on Self-Determination Theory do not directly manipulate mindfulness. However, given the close association between mindfulness and autonomy, it is conceivable that mindfulness also has a counter-depletion effect.

Interpersonal impact of mindfulness

This paper has chiefly reviewed the intrapersonal effects of mindfulness. Before closing, interpersonal implications of mindfulness will be briefly discussed.

Mindfulness and empathy

Studies have found that mindfulness affects empathy. For example, Beitel, Ferrer, & Cecero (2005) found that mindfulness was related to both the cognitive (perspective taking) and affective (empathic concern) aspects of empathy. On the other hand, mindfulness was negatively correlated with personal distress derived from interpersonal interaction.

Decety & Lamm (2006) reviewed evidence from social psychology and cognitive neuroscience, including recent behavioral and functional neuroimaging studies, and found that the results suggested that empathy arises from the interaction of automatic emotional resonance between people and executive control (or metacognitive monitoring). Human can automatically feel others' emotions. However, to utilize empathy (e.g., to help a distressed person), one should both feel what others feel and not be overwhelmed by that feeling. Otherwise, people will avoid distressed people in order to reduce their own aroused emotions. Decety & Lamm's (2006) discussion suggests that to be empathic requires clear awareness and decentered attitudes toward others' emotions. This seems close to mindfulness.

Mindfulness and compassion

Self-esteem is one of the most studied psychological constructs because of its salutary effects. However, recent mindfulness studies have revealed that self-esteem is not the single best way to well-being. Gilbert (2005), for example, proposed compassion-focused therapy, which uses imagery of tenderly treating oneself or others during meditation. This intervention promotes non-critical, affectionate attitudes toward oneself and reduces emotional distress. Such compassionate attitudes toward oneself are different from self-esteem.

Neff & Vonk (2009) presented evidence indicating differences between self-esteem and self-compassion. They defined self-compassion as consisting of tenderness toward oneself, a sense of relatedness toward humanity, and a mindful stance toward distress. Whereas self-esteem was related to competitiveness, narcissism, and financial income, self-compassion was not. In addition, self-compassion was negatively related to unstable self-esteem, social comparison, public self-consciousness, and cognitive closure. Neff & Vonk's (2009) study indicated advantages of self-compassion over self-esteem.

Interestingly, the construct of self-compassion involves mindful attitudes. Although Gilbert's (2005) compassion-focused therapy uses compassionate imagery directly, compassion has long been known to be a concomitant of mindfulness meditation. Therefore, it can be concluded that mindfulness brings attitudes toward oneself that are quite different from competitive self-esteem. Mindfulness-induced happiness does not rely on income.

Conclusions

The present article reviewed evidence on the salutary effect of mindfulness in clinical and motivation areas. Clinical disorders are characterized by difficulty in controlling symptoms. Mindfulness suggests ways to refrain from further preoccupation with automatically arising negative thoughts and emotions. In addition, it was suggested that mindfulness may enhance the ability to derive satisfaction from daily life.

Mindfulness also has implications for self-regulation in broader areas. Mindfulness seems to enhance autonomy. However, the situation is a bit more complicated, because automatic processes can also underpin autonomy or other, higher self-regulation.

Is mindfulness (or consciousness) a redundant option or an even more costly way to self-regulation? The answer may be "no". First, mindfulness can counter undesirable effects of automatic processing. Second, autonomous regulation does not cause a depletion of resources for self-regulation.

Taken together, the construct of mindfulness presents a novel way to understand and promote well-being. With mindfulness, people are not bothered by spontaneous (negative) emotions, their income level, or competitive self-esteem. The life style that mindfulness suggests may be an alternative to much of modern society, which places too much emphasis on material wealth.

Finally, limitations of current evidence and future directions should be considered. First, some of the studies cited above are based on cross-sectional individual-difference designs. However, results from those studies may suggest fruitful avenues for future interventions or experimental studies. Because mindfulness is tied to systematic training methods, intervention studies can follow soon. Second, precise mediating mechanisms of the salutary effect of mindfulness are not yet clear. One possibility is that they are reducible to more basic mechanisms, such as executive control. Conversely, there may be multiple mediators. The answers await empirical investigation.

References

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev. ; DSM-IV-TR). Washington, DC : Author.

Bargh, J. A., & Morsella, E. (2008). The unconscious mind. *Perspectives on Psychological Science*, **3**, 73–79.

Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego-depletion : Is the active self a limited resource? *Journal of Personality and Social Psychology*, **74**, 1252–1265.

Beauregard, M., Lévesque, J., & Bourgouin, P. (2001). Neural correlates of conscious self-regulation of emotion. *Journal of Neuroscience*, **21**, RC165 : 1–6.

Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York : International University Press.

Beitel, M., Ferrer, E., & Cecero, J. J. (2005). Psychological mindedness and awareness of self and others. *Journal of Clinical Psychology*, **61**, 739–750.

Brown, K. W., & Kasser, T. (2005). Are psychological and ecological well-being compatible? The role of values, mindfulness, and lifestyle. *Social Indicators Research*, **74**, 349–368.

Brown, K. W., Kasser, T., Ryan, R. M., Linley, P. A., & Orzech, K. (2009). When what one has is enough : Mindfulness, financial desire discrepancy, and subjective well-being. *Journal of Research in Personality*, **43**, 727–736.

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.

Chatzisarantis, N. L. D., & Hagger, M. S. (2007). Mindfulness and the intention-behavior relationship within the theory of planned behavior. *Personality and Social Psychology Bulletin*, **33**, 663–676.

Decety, J., & Lamm, C. (2006). Human empathy through the lens of social neuroscience. *Scientific World Journal*, **6**, 1146–1163.

Dimidjian, S., Hollon, S. D., Dobson, K. S., Schmaling, K. B., Kohlenberg, R., Addis, M., Gallop, R., McGlinchey, J., Markley, D., Gollan, J. K., Atkins, D. C., Dunner, D. L., & Jacobson, N. S. (2006). Randomized trial of behavioral activation, cognitive therapy, and antidepressant medication in the acute

treatment of adults with major depression. *Journal of Consulting and Clinical Psychology*, **74**, 658–670.

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.

Gilbert, P. (Ed.) (2005). *Compassion : Conceptualisation, research and use in psychotherapy*. London: Brunner-Routledge.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition : The Implicit Association Test. *Journal of Personality and Social Psychology*, **74**, 1464–1480.

Gronwall, D. M. A. (1977). Paced auditory serial-addition task : A measure of recovery from concussion. *Perceptual and Motor Skills*, **44**, 367–373.

Henriques, J. B., & Davidson, R. J. (1990). Regional brain electrical asymmetries discriminate between previously depressed and healthy control subjects. *Journal of Abnormal Psychology*, **99**, 22–31.

Kabat-Zinn, J. (1994). *Wherever you go, there you are : Mindfulness meditation in everyday life*. New York: Hyperion.

Langer, E. J. (2000). Mindful learning. *Current Directions in Psychological Science*, **9**, 220–223.

Levesque, C., & Brown, K. A. (2007). Mindfulness as a moderator of the effect of implicit motivational self-concept on day-to-day behavioral motivation. *Motivation and Emotion*, **31**, 284–299.

Levesque, C., Copeland, K. J., & Sutcliffe, R. A. (2008). Conscious and nonconscious processes: Implications for self-determination theory. *Canadian Psychology*, **49**, 218–224.

Levesque, C., & Pelletier, L. G. (2003). On the investigation of primed and chronic autonomous and heteronomous motivational orientation. *Personality and Social Psychology Bulletin*, **29**, 1570–1584.

Levy, B. R., Jennings, P., & Langer, E. J. (2001). Improving attention in old age. *Journal of Adult Development*, **8**, 189–192.

Lutz, A., Slagter, H. A., Dunne, J. D., & Davidson, R. J. (2008). Attention regulation and monitoring in meditation. *Trends in Cognitive Sciences*, **12**, 163–169.

Martell, C., Addis, M., & Dimidjian, S. (2004). Finding the action in behavioral activation : The search for empirically supported interventions and mechanisms of change. In S. C. Hayes, V. M. Follette, & M. M. Linehan (Eds.), *Mindfulness and acceptance : Expanding the cognitive-behavioral tradition* (pp. 152–167). New York : Guilford.

Masedo, A. I., & Esteve, M. R. (2007). Effects of suppression, acceptance and spontaneous coping on pain tolerance, pain intensity and distress. *Behaviour Research and Therapy*, **45**, 199–209.

Mauss, I. B., Cook, C. L., & Gross, J. J. (2007). Automatic emotion regulation during anger provocation. *Journal of Experimental Social Psychology*, **43**, 698–711.

Mohlman, J., & Gorman, J. M. (2005). The role of executive functioning in CBT : A pilot study with anxious older adults. *Behaviour Research and Therapy*, **43**, 447–465.

Neff, K. D., & Vonk, R. (2009). Self-compassion versus global self-esteem : Two different ways of relating to oneself. *Journal of Personality*, **77**, 23–50.

Nix, G., Ryan, R. M., Manly, J. B., & Deci, E. L. (1999). Revitalization through self-regulation : The effects of autonomous versus controlled motivation on happiness and vitality. *Journal of Experimental Social Psychology*, **35**, 266–284.

Ochsner, K. N., Ray, R. D., Cooper, J. C., Robertson, E. R., Chopra, S., Gabrieli, J. D., & Gross, J. J. (2004). For better or for worse : Neural systems supporting the cognitive down- and up-regulation of negative emotion. *Neuroimage*, **23**, 483–499.

Orsillo, S. M., Roemer, L., Lerner, J. B., & Tull, M. T. (2004). Acceptance, mindfulness, and cognitive-behavioral therapy : Comparisons, contrasts, and application to anxiety. In S. C. Hayes, V. M. Follette, & M. M. Linehan (Eds.), *Mindfulness and acceptance : Expanding the cognitive-behavioral tradition* (pp. 66–95). New York : Guilford.

Ostafin, B. D., & Marlatt, G. A. (2008). Surfing the urge: Experiential acceptance moderates the relation between automatic alcohol motivation and hazardous drinking. *Journal of Social and Clinical Psychology*, **27**, 404–418.

Rachman, S. J., & de Silva, P. (1978). Abnormal and normal obsession. *Behaviour Research and Therapy*, **16**, 233–248.

Radel, R., Sarrazin, P., Legrain, P., & Gobancé, L. (2009). Subliminal priming of motivational orientation in educational settings : Effect on academic performance moderated by mindfulness. *Journal of Research in Personality*, **43**, 695–698.

Ratelle, C. F., Baldwin, M. W., & Vallerand, R. J. (2005). On the cued activation of situational motivation. *Journal of Experimental Social Psychology*, **41**, 482–487.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, **55**, 68–78.

Ryan, R. M., & Deci, E. L. (2008). From ego depletion to vitality : Theory and findings concerning the facilitation of energy available to the self. *Social and Personality Psychology Compass*, **2**, 702–717.

Sansone, C., Wiebe, D., & Morgan, C. (1999). Self-regulating interest : The moderating role of hardiness and conscientiousness. *Journal of Personality*, **67**, 701–733.

Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression*. New York : Guilford.

Sheppard, L. C., & Teasdale, J. D. (2000). Dysfunctional thinking in major depressive disorder : A deficit in metacognitive monitoring ? *Journal of Abnormal Psychology*, **109**, 768–776.

Shimojo, S. (1999). *What is consciousness ? Plasticity of the brain, and visual illusions*. Tokyo : Kodansha. (in Japanese)

Siegle, G. J., Ghinassi, F., & Thase, M. E. (2007). Neurobehavioral therapies in the 21st century : Summary of an emerging field and an extended example of cognitive control training for depression. *Cognitive Therapy and Research*, **31**, 235–262.

Sugiura, Y. (2006). Personality correlates of mindfulness. In M. G. T. Kwee, K. J. Gergen, & F. Koshikawa (Eds.), *Horizons in Buddhist psychology: Practice, research & theory* (pp. 251–266). Chagrin Falls, OH : Taos Institute Publications.

Sugiura, Y. (2007). Metacognitive mediation of the psychotherapeutic effects : The role of detached mindfulness and attentional underpinning. *Japanese Psychological Review*, **50**, 328–340.

Tang, Y. Y., & Posner, M. I. (2009). Attention training and attention state training. *Trends in Cognitive Sciences*, **13**, 222–227.

Teasdale, J. D., & Dent, J. (1987). Cognitive vulnerability to depression : An investigation of two hypotheses. *British Journal of Clinical Psychology*, **26**, 113–126.

Teasdale, J. D., Moore, R. G., Hayhurst, H., Pope, M., Williams, S., & Segal, Z. V. (2002). Metacognitive awareness and prevention of relapse in depression: Empirical evidence. *Journal of Consulting and Clinical Psychology*, **70**, 275–287.

Teasdale, J. D., Scott, J., Moore, R. G., Hayhurst, H., Pope, M., & Paykel, E. S. (2001). How does cognitive therapy prevent relapse in residual depression: Evidence from a controlled trial. *Journal of Consulting and Clinical Psychology*, **69**, 347–357.

Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby, J. M., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology*, **68**, 615–623.

Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K. M., & Deci, E. L. (2004). Motivating learning, performance, and persistence : The synergistic effects of intrinsic-goal contents and autonomy-supportive contexts. *Journal of Personality and Social Psychology*, **87**, 246–260.

Verplanken, B., Friborg, O., Wang, C. E., Trafimow, D., & Woolf, K. (2007). Mental habits : Metacognitive reflection on negative self-thinking. *Journal of Personality and Social Psychology*, **92**, 526–541.

Wells, A. (1990). Panic disorder in association with relaxation induced anxiety : An attentional training approach to treatment. *Behavior Therapy*, **21**, 273–280.

Wells, A. (2002). GAD, metacognition, and mindfulness : An information processing analysis. *Clinical Psychology : Science and Practice*, **9**, 95–100.