

RUNNING HEAD: Meta-Cognitive Processes Model of Decentering

Decentering and Related Constructs: A Critical Review and Meta-Cognitive Processes

Model

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[In Press, *Perspectives on Psychological Science*]

Key Words: cognitive (de)fusion; cognitive distancing; decentering; (dis)identification; meta-awareness; metacognition; metacognitive awareness; mindfulness; (non)reactivity; psychological distance; self-as-context; self-distanced perspective; self-referential processing.

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Author Note. Dr. Bernstein recognizes the funding support from the Israeli Council for Higher Education Yigal Alon Fellowship, the European Union FP-7 Marie Curie Fellowship

International Reintegration Grant, Israel Science Foundation, Psychology Beyond Borders Mission Award, the University of Haifa Research Authority Exploratory Grant, and the Rothschild-Caesarea Foundation's Returning Scientists Project at the University of Haifa.

Abstract

The capacity to shift experiential perspective – *from within* one’s subjective experience, *onto* that experience – is fundamental to being human. Scholars have long theorized that this meta-cognitive capacity – that we refer to as *decentering* – may play an important role in mental health. To help illuminate this mental phenomenon and its links to mental health, we critically examine decentering-related constructs and their respective literatures (e.g., self-distanced perspective, cognitive distancing, cognitive defusion). First, we introduce a novel meta-cognitive processes model of decentering. Specifically, we propose that, to varying degrees, decentering-related constructs reflect a common mental phenomenon sub-served by three inter-related meta-cognitive processes: meta-awareness, disidentification from internal experience, and reduced-reactivity to thought content. Second, we examine extant research linking decentering-related constructs and their underlying meta-cognitive processes to mental health. We conclude by proposing future directions for research that transcends decentering-related constructs in an effort to advance the field’s understanding of this facet of human experience and its role in (mal)adaptation.

Decentering and Related Constructs: A Critical Review and Meta-Cognitive Processes Model

We can each be both actors engrossed in the unfolding story of our mind's experience of the world, as well as a third-person observer of that subjective experience. Indeed, the capacity to shift experiential perspective – *from within* one's subjective experience, *onto* that experience – is fundamental to being human. Scholars have long believed that the process of *stepping out* from our experience and looking upon it is important to mental health (James, 1890). Accordingly, the field is permeated with various ostensibly distinct constructs that, we argue in this paper, each reflect this common mental phenomenon to varying degrees. In alphabetical order, these constructs include: *cognitive defusion* (or deliteralization; Hayes, Strosahl, & Wilson, 1999a, 2012), *cognitive distancing* (Beck, Rush, Shaw, & Emery, 1979; Ingram & Hollon, 1986), *decentering* (Safran & Segal, 1990), *detached mindfulness* (Wells, 2005), *metacognitive awareness* (Teasdale, 2002), *metacognitive mode* (Wells, 2000), *mindfulness* (e.g., Bishop et al., 2004), *reperceiving* (Shapiro, Carlson, Astin, & Freedman, 2006), *self-as-context* (Grieger, 1985; Hayes et al., 1999a, 2012), and *self-distanced perspective* (Kross, Ayduk, & Mischel, 2005). Throughout the paper, we use the term *decentering* to refer to the common mental phenomenon that we argue transcends these related constructs. We chose this term specifically because we believe that the theoretical conceptualization of the construct of decentering, reviewed below, most comprehensively captures the common mental processes that we believe cut across all related constructs. Accordingly, to refer collectively to these constructs, we use the term *decentering-related constructs*.

The overarching objective of the present manuscript is to examine outstanding questions regarding the nature of decentering-related constructs and the mental phenomenon(a) they

represent. These questions include: What meta-cognitive processes sub-serve the mental phenomenon of decentering? Do these meta-cognitive processes help advance our understanding of the overlap and differences between decentering-related constructs? To what degree and through what plausible mechanisms might the mental phenomenon of decentering and its meta-cognitive processes relate to mental health?

To examine these questions, the manuscript is organized as follows. First, we propose a novel *Meta-Cognitive Processes Model of Decentering*. Second, we describe each decentering-related construct and then relate each construct to the proposed meta-cognitive processes model. In turn, we review empirical evidence linking each construct to the meta-cognitive processes model and to mental health. Finally, we highlight future directions for the psychological science of decentering-related constructs.

A Meta-Cognitive Processes Model of Decentering

We propose a model describing three inter-related psychological processes that, together, constitute the mental phenomenon of decentering (see Figure 1). This *Meta-Cognitive Processes Model of Decentering* entails three inter-related processes: *Meta-Awareness*, *Disidentification from Internal Experience*, and *Reduced-Reactivity to Thought Content*. We believe that this model may help integrate decentering-related constructs by elucidating the core processes that transcend, and potentially differentiate, between these constructs. Below, we describe each meta-cognitive process and then describe their relations.

Meta-Awareness

Meta-awareness is **awareness of subjective experience** (or the explicit awareness of the contents of consciousness; Schooler, 2002; Smallwood & Schooler, 2015). Meta-awareness can also be conceptualized as awareness of present moment experience as a process, i.e., an

awareness of the processes occurring in consciousness (e.g., thinking, feeling, sensing; Blackledge, 2007; Carmody, 2009; Hayes et al., 2012; Segal, Williams, & Teasdale, 2013). Accordingly, this "meta-" level of awareness is distinguished from awareness of the *contents* of thoughts (i.e., mental representations) without concurrent meta-awareness of the thinking *process*; or similarly, awareness of the objects producing sense impressions with no meta-awareness of the sense impressions themselves (Hölzel et al., 2011; Schooler, 2002; Vago & Silbersweig, 2012). For example, a person may be aware of the contents of a self-judgmental thought (e.g., 'I am worthless'); or a person may be *meta-aware* of the thinking processes within which that self-judgmental thought occurs (e.g., 'I am thinking a self-critical thought'). Similarly, a person may be aware of the conceptual representation of an external object (e.g., 'Computer screen in front of me'); or a person may be *meta-aware* of the subjective experiences produced by perceiving this object (e.g., awareness of sense impressions, of emotional reactions, and of engaging in reading, thinking, etc.).

Disidentification from Internal Experience

Disidentification from internal experience is **the experience of internal states as separate from one's self**. This experiential disidentification contrasts with the human tendency to identify with subjective experience, and therein experience internal states such as thoughts, emotions and sensations as integral parts of the self (Gusnard, 2005; Jordan, 2003). For example, when a person is identified with her/his experience of fear, she/he may verbally relate to it by noting, 'I am afraid'. However, when disidentified from fear, she/he may relate to it by simply noting, 'a feeling of fear'. Disidentification from internal experience is thus linked to experiencing sensations, emotions and thoughts from a third-person perspective (Esslen et al., 2008; Kross et al., 2005; Tagini & Raffone, 2010). Importantly, this process does not refer to

conceptual forms of disidentification (e.g., ‘I am generally not a happy person’), which are forms of narrative self-referential processing (i.e., thinking about the self across time; Dor-Ziderman, Berkovich-Ohana, Glicksohn, & Goldstein, 2013; Esslen, Metzler, Pascual-Marqui, & Jancke, 2008; Farb et al., 2007; Gallagher, 2000; Tagini & Raffone, 2010; Vago & Silbersweig, 2012).

Reduced-Reactivity to Thought Content

Reduced-reactivity to thought content is the **reduced effects of thought content on other mental processes** (e.g., attention, emotion, cognitive elaboration, motivation, motor planning). For example, the thought, ‘Oh no, he doesn't like me’ during a social interaction, will not necessarily engender anxiety or post-event rumination, nor avoidance of the social situation that may be expected to follow from elevated reactivity to this type of self-critical thought content. As another example, the thought, ‘I am fat,’ may not trigger self-focus on one’s body, nor self-critical thought and feelings of guilt or shame.

Inter-Relations Between the Three Meta-Cognitive Processes

We propose that these three psychological processes, together, constitute the mental phenomenon of decentering. Thus, understanding the inter-relations between three meta-cognitive processes is important to the model. First, we propose that disidentification from internal experience and reduced-reactivity to thought content are initiated by meta-awareness (see Figure 1). Specifically, we propose that meta-awareness engenders disidentification from internal experience because the act of observing subjective experience creates a distinction (i.e., disidentification) between the observing self or consciousness, and the observed subjective experience (Deikman, 1982; Goleman, 1980; Hölzel et al., 2011; Shapiro et al., 2006). Moreover we theorize that meta-awareness engenders reduced-reactivity to thought content by directing attention to present moment experiences rather than thought content and its related mental

representations (Hayes et al., 1999a, 2012; Segal et al., 2013; Teasdale, Segal, & Williams, 1995). In addition, when meta-awareness is directed toward the process of thinking, thought content may be construed as interpretations of present/past/future situations and experiences, and therefore not necessarily an accurate representations of these situations and experiences (Hayes et al., 1999a, 2012; Safran & Segal, 1990). When construed in this way, thought content is no longer treated as fact or as a binding rule, and therefore its impact on other mental processes such as motivation, motor planning, and emotion is reduced (Hayes et al., 1999a, 2012; Teasdale, Moore, Hayhurst, Pope, Williams, & Segal, 2002).

Second, we also theorize that disidentification from internal experience and reduced-reactivity to thought content likely affect one another (see Figure 1). For example, reduced-reactivity to negative thought content (e.g., ‘he is so annoying’) may not only reduce emotional reactivity to that thought content (e.g., anger), but may also reduce identification with those emotions (e.g., ‘a feeling of anger’ instead of ‘I am angry’). Moreover, disidentification from thoughts may lead to construals of thoughts as less significant to one’s self (e.g., ‘this is just a thought’ instead of ‘I think that...’), and thereby reduce a person’s reactivity to their content (Shapiro et al., 2006; Teasdale et al., 2002).

Finally, we theorize that disidentification from internal experience and reduced-reactivity to thought content reinforce meta-awareness (see Figure 1). Disidentification from internal experience creates an experiential distinction between the observing self and (aversive) subjective experience. We theorize that this distinction promotes tolerance of aversive internal experience, thereby facilitate the capacity to maintain meta-awareness of these states (Beck et al., 1979; Hayes et al, 2012; Shapiro et al., 2006). Moreover, we theorize that while engaging in negative evaluative thoughts of an experience (e.g., ‘It's dangerous to feel anxious’), reduced-

reactivity to thought content may also promote the capacity to maintain meta-awareness of this experience, by reducing the reactive tendency to orient attention away from it (Ehlers & Steil, 1995; Grabovac, Lau, & Willett, 2011; Starr & Moulds, 2006; Williams & Moulds, 2008).

Decentering-Related Constructs: Conceptual and Empirical Links to the Meta-Cognitive Processes Model and Mental Health

In this section we review conceptual definitions and empirical evidence linking each decentering-related construct, first, to our proposed meta-cognitive processes model and, second, to mental health.^a We organized this section by reviewing the decentering-related constructs in order of their relevance to the proposed meta-cognitive processes model; beginning with the constructs that most comprehensively reflect all three proposed meta-cognitive processes. Table 1 provides a summary of the decentering-related constructs with respect to the proposed meta-cognitive processes. Table 2 provides a summary of the means by which these constructs have been operationalized/measured to-date.

Decentering and Metacognitive Awareness

Conceptualization. The construct of decentering is conceptualized as the ability to, “step outside of one’s immediate experience, thereby changing the very nature of that experience” (Safran & Segal, 1990, p. 117). Similarly, metacognitive awareness is conceptualized as a meta-cognitive monitoring process which enables one to decenter from thoughts, and thereby view thoughts as events in the mind rather than reflections of external reality or of one’s self (Segal et al., 2002, 2013). Indeed, Teasdale and colleagues (2002, p. 276) refer to “the process of experiencing negative thoughts and feelings within a decentered perspective as metacognitive awareness”.

We reason that the constructs of decentering and metacognitive awareness reflect all three of the proposed meta-cognitive processes – meta-awareness, disidentification from internal experience, and reduced-reactivity to thought content. First, decentering and metacognitive awareness by definition entail observation of subjective experience, as we conceptualize meta-awareness. Second, decentering and metacognitive awareness are conceptualized as stepping outside of one’s immediate experience; hence they also reflect disidentification from internal experience. Third, decentering and metacognitive awareness entail reduced-reactivity to thought content particularly in so far as, “experienced and interpreted through such a decentered cognitive set... negative thoughts and feelings will have different cognitive, emotional, and behavioral consequences than if they are experienced and interpreted as ‘me’ or ‘reality’ ” (Teasdale et al., 2002, p. 276).

Empirical links to meta-cognitive processes model^b. Two self-report instruments were developed to operationalize and measure decentering – the *Experiences Questionnaire - Decentering* subscale (EQ; Fresco et al. 2007a) and the *Toronto Mindfulness Scale - Decentering* subscale (TMS; Lau et al., 2006). With respect to our meta-cognitive processes model these measures reflect disidentification from internal experience. A number of items in both measures also reflect meta-awareness; no items in the EQ clearly reflect reduced-reactivity to thought content; and only one item in the decentering subscale of the TMS reflects this process (item number 4; Lau et al., 2006). Accordingly, we conceptualize the EQ and TMS-Decentering scales as primarily measures of the more specific decentering-related process of disidentification from internal experience. Metacognitive awareness has been measured by the *Measure of Awareness and Coping in Autobiographical Memory* (MACAM; Moore, Hayhurst, & Teasdale, 1996). A semistructured interview, the MACAM was designed to measure metacognitive awareness of

autobiographical memories elicited by depression-related cues. High levels of metacognitive awareness are reflected by verbal descriptions of recalled memories “in which negative thoughts and feelings are seen as passing mental events rather than as aspects of self” (Teasdale et al., 2002, p. 277). Thus, much like the EQ and TMS-Decentering scales, the MACAM also seems to primarily measure disidentification from internal experience as conceptualized in our meta-cognitive processes model.

Various controlled and uncontrolled studies have examined the effects of mindfulness on decentering-related disidentification from internal experience assessed with the EQ, TMS and MACAM. As meta-awareness is an integral component of mindfulness (Carmody, 2009; Holas & Jankowski, 2013; Jankowski & Holas, 2014; Vago & Silbersweig, 2012), these mindfulness-decentering studies are well-suited to begin to test the relations we theorize between meta-awareness and disidentification from internal experience, as hypothesized in our proposed meta-cognitive processes model of decentering. In several trials of mindfulness-based manipulations and interventions, disidentification from internal experience as measured by the EQ, TMS and MACAM increased from pre- to post-treatment (Bieling et al., 2012; Carmody, Baer, Lykins, & Olendzki, 2009; Lau et al., 2006), and this increase was significantly greater relative to control conditions (Feldman, Greeson & Senville, 2010; Gayner et al., 2012; Hargus, Crane, Barnhofer, & Williams, 2010; Hoge et al., 2014; Orzech, Shapiro, Brown, & McKay, 2009; Tanay, Lotan, & Bernstein, 2012; Teasdale et al., 2002). Furthermore, in two of these studies elevations in dispositional and state mindfulness during mindfulness interventions were related to elevation in disidentification from internal experience as measured by the EQ (Carmody Baer, Lykins, & Olendzki, 2009; Tanay, Lotan, & Bernstein, 2012). Therefore, mindfulness-

decentering/metacognitive awareness studies support the idea that meta-awareness may indeed engender disidentification, as hypothesized in our proposed meta-cognitive processes model.

Empirical links to mental health. A number of controlled and uncontrolled studies have examined the role of decentering-related disidentification from internal experience in mental health and well-being. First, studies found that disidentification from internal experience as measured by the EQ and MACAM was associated with anxiety and depression symptoms (McCracken, Gutiérrez-Martínez, & Smythe, 2012; Teasdale et al., 2002). Second, in trials of mindfulness-based interventions conducted among various populations, disidentification from internal experience as measured by the EQ, TMS and MACAM mediated treatment gains. For example, changes in disidentification from internal experience were related to reduced levels of anxiety and depressive symptoms (Bieling et al., 2012; Gayner et al., 2012; Lau et al., 2006; Teasdale et al., 2002), reduced avoidance, increased positive affect (Gayner et al., 2012) and other mental health related treatment outcomes (Fresco, Segal, Buis, & Kennedy, 2007b; Hoge et al., 2014; Lau et al., 2006; Orzech et al., 2009; Tanay et al., 2012). In total, this body of studies supports the idea that disidentification from internal experience is associated with various facets of mental health, and mediates the effects of mindfulness-based interventions or meta-awareness on these outcomes.

Cognitive Distancing

Conceptualization. Distancing of one's self from one's thoughts is conceptualized as central to adaptively reflecting upon and engaging with or disputing dysfunctional cognitions (Beck et al., 1979). We reason that the construct of cognitive distancing reflects all three of the proposed meta-cognitive processes – meta-awareness, disidentification from internal experience, and reduced-reactivity to thought content. First, distancing of one's self from one's thoughts

reflects a process of disidentification from thoughts. Second, Beck and colleagues theorize that cognitive distancing facilitates the capacity to observe thoughts as psychological events, and thereby engage with these events in a more adaptive manner (Beck et al., 1979). Thus, in terms of our meta-cognitive processes model, cognitive distancing from thoughts also reflects meta-awareness of these thoughts. Third, Ingram and Hollon (1986) conceptualize cognitive distancing as a “switch process” into a metacognitive mode, which permits a person to engage with maladaptive cognitions, while also getting out of an automatic mode in which such maladaptive cognitions go unmonitored and lead to maladaptive behavior. This metacognitive mode that reduces the effects of maladaptive cognitions on behavior is similar to reduced-reactivity to thought content. Therefore, we argue that conceptually, cognitive distancing reflects all three processes of our meta-cognitive processes model of decentering; though, unlike decentering, cognitive distancing reflects the activation of these processes in reference to thoughts, but not necessarily other internal states.

Empirical links to meta-cognitive processes model and mental health. Despite the foundational role of *cognitive distancing* in multiple related literatures, and the extensive theoretical attention it received, we are not aware of direct empirical study of cognitive distancing beyond the large body of research on Beck’s cognitive therapy. In this large cognitive therapy literature, cognitive distancing, in addition to a variety of other cognitive-behavioral phenomena, are targeted therapeutically (Butler, Chapman, Forman, & Beck, 2006).

Accordingly, it is not possible to make specific inferences about cognitive distancing per se, or our meta-cognitive processes model from these therapy studies.

Metacognitive Mode and Detached Mindfulness

Conceptualization. The concept of *metacognitive mode* (Wells, 2000) was introduced within the Self-Regulatory Executive Function model of emotional disorders (Wells & Matthews, 1994, 1996). Metacognitive mode is conceptualized as a mental state in which, “thoughts can be consciously observed as separate events from the self and the world... individual's relationship to thoughts is one of standing back and observing them as part of a greater multifaceted landscape of conscious experience” (Wells, 2011, p. 8). An inverse mode – *object mode* – is theorized to be maladaptive, and characterized by fusion of thoughts or beliefs with the direct experience of the self or the world (Wells, 2000).

First, in terms of our meta-cognitive processes model, metacognitive mode entails meta-awareness and disidentification from internal experience. Furthermore, metacognitive mode is also conceptualized as a state in which an individual can refer to his thoughts, appraisals and beliefs “as events that should be evaluated and not merely accepted as depictions of reality” (Wells, 2000, p. 27). This conceptualization reflects reduced-reactivity to thought content – specifically, reduced believability of thought content and the resulting reduced effect of thought content on emotion and behavior. Furthermore, meta-cognitive mode is conceptualized to enable *detached mindfulness* described as “an objective awareness of a thought or belief,... the disengagement of any conceptual or coping based activity in response to the thought and... separating the conscious experience of self from the thought” (Wells, 2011, p. 8). Accordingly, we reasoned that the constructs of metacognitive mode and detached mindfulness may reflect all three of the proposed meta-cognitive processes included in our model; though like cognitive distancing it reflects the activation of these processes in reference to thoughts, but not necessarily other internal states.

Empirical links to meta-cognitive processes model and mental health. We are not aware of direct empirical study of metacognitive mode or detached mindfulness beyond the body of research on Metacognitive Therapy, wherein metacognitive mode in addition to a variety of other cognitive-behavioral phenomena are targeted therapeutically (Wells, 2011). Accordingly, it is not possible to make specific inferences about metacognitive mode or detached mindfulness per se, or our meta-cognitive processes model from these therapy studies.

Reperceiving

Conceptualization. Reperceiving is defined as the ability to “disidentify from the contents of consciousness (i.e., one's thoughts) and view moment-by-moment experience with greater clarity and objectivity” (Shapiro et al., 2006, p. 377). Reperceiving is conceptualized to permit a person to, “dis-identify from thoughts, emotions, and body sensations as they arise, and simply be with them” (p. 378). Accordingly, with respect to our meta-cognitive processes model, we understand reperceiving to entail both the processes of meta-awareness and disidentification from internal experience, but not necessarily reduced-reactivity to thought content.

Empirical links to meta-cognitive processes model and mental health. Two studies reviewed above used the EQ, a measure of decentering, to measure reperceiving in mindfulness based interventions (Carmody et al., 2009; Orzech et al., 2009). We are not aware of any other empirical studies on reperceiving.

Mindfulness

Conceptualization. The concept and practice of mindfulness originated in the Buddhist tradition, and reflects a number of Buddhist and secular meditative practices and related states of awareness (Anālayo, 2003; Thanissaro, 1996). It is largely agreed among scholars that mindfulness is characterized by present moment attention (PMA) and awareness (Anālayo, 2003;

Bishop et al., 2004; Kabat-Zinn, 1990; Segal et al., 2013; Shapiro et al., 2006; Thanissaro, 1996). With respect to our meta-cognitive processes model of decentering, meta-awareness is considered an integral component of mindfulness (Carmody, 2009; Holas & Jankowski, 2013; Jankowski & Holas, 2014; Vago & Silbersweig, 2012). Other scholars propose that mindfulness incorporates decentering (Lau et al., 2006). However, we argue that defining mindfulness in this way confounds mindfulness with one of its proximal mechanisms of action, decentering (e.g., Tanay & Bernstein, 2013). Thus, with respect to our meta-cognitive processes model, mindfulness entails the process of meta-awareness, and though it may engender, it's not one and the same with, disidentification from internal experience nor reduced-reactivity to thought content.

Empirical links to meta-cognitive processes model. The empirical literature on mindfulness is far too expansive to be reviewed here (for recent reviews see Chiesa, Calati, & Serretti, 2011; Hölzel et al., 2011; Keng, Smoski & Robins, 2011). Accordingly, we chose to more selectively review investigations linking mindfulness to decentering-related constructs. These findings provide evidence linking mindfulness practice and decentering-related constructs, and therein support our hypothesized relations between meta-awareness and disidentification from internal experience (i.e., mindfulness and decentering/metacognitive awareness reviewed above) as well as with reduced-reactivity to thought content (i.e., mindfulness and cognitive defusion reviewed below).

Empirical links to mental health. Similarly, the empirical literature on the effects of mindfulness on mental health is far too expansive to be reviewed here. A recent meta-analysis documented that mindfulness-based interventions are moderately effective for improving anxiety and mood symptoms (Hofmann, Sawyer, Witt, & Oh, 2010). Notably, among patients with

anxiety and mood disorders, these effects are large in magnitude (Hofmann et al., 2010). These effects provide support for theorizing that mindfulness – and therein meta-awareness – contributes to mental health.

Cognitive Defusion

Conceptualization. Cognitive (de)fusion is rooted in relational frame theory (Hayes, Barnes-Holmes, & Roche, 2002), and the behavioral psychotherapy Acceptance and Commitment Therapy (ACT; Hayes et al., 1999a, 2012). Cognitive fusion is a process that strengthens the automatic effects of verbal thought content on behavior (Hayes et al., 2012). Conversely, Cognitive *defusion* is a process that reduces the automatic effects of verbal thought content on behavior “such that other sources of behavioral regulation can better participate in the moment” (Hayes et al., 2012, p. 245). Accordingly, cognitive *defusion* has been described as the process that enables a person to, “to see thoughts and feelings for what they are (i.e., a verbally entangled process of minding) rather than what they advertise themselves to be (e.g., the world understood, structured reality)” (Hayes et al., 1999a, p. 150). Thus, viewed through our meta-cognitive processes model of decentering, the construct of cognitive defusion reflects reduced-reactivity to thought content (cf. cognitive fusion reflects increased-reactivity to thought content). Specifically, cognitive defusion reflects the reduced effects of verbal thought content on behavior, and on mental processes influencing the activation of behavior.

Empirical links to meta-cognitive processes model. Two self-report measures of cognitive (de)fusion are particularly relevant to our meta-cognitive processes model: the *Drexel Defusion Scale* (DDS; Forman et al., 2012) and the *Cognitive Fusion Questionnaire* (CFQ; Gillanders et al., 2014; see Table 2 for additional measures of (de)fusion). The DDS measures defusion defined as, “the ability to achieve psychological distance from internal experiences such

as thoughts and feelings” (Forman et al., 2012, p. 55). Accordingly, with respect to our meta-cognitive processes model, DDS item content reflects meta-awareness and disidentification from internal experience and, but to a lesser degree, reduced-reactivity to thought content. The CFQ is defined and designed to measure cognitive fusion as “the tendency for behavior to be overly regulated and influenced by cognition” (Gillanders et al., 2014, p. 84). With respect to our meta-cognitive processes model, CFQ item content reflects reduced/increased-reactivity to thought content, but not meta-awareness nor disidentification from internal experience.

One controlled study, reviewed above with respect decentering (Tanay et al., 2012), examined the effects of mindfulness on cognitive (de)fusion-related reactivity to thought content. Tanay and colleagues reported that relative to a no-intervention control condition, participants who received a mindfulness intervention, demonstrated elevations in dispositional and state mindfulness that were related to reductions in cognitive fusion as measured by the CFQ. Consistent with our meta-cognitive processes model, these preliminary findings indicate that meta-awareness may elicit reduced-reactivity to thought content.

Empirical links to mental health. Studies of cognitive (de)fusion include those that have measured the construct, and those that have experimentally targeted it without measuring it. We first review the former set of studies. First, cognitive defusion as measured by the DDS was correlated with levels of psychopathology symptoms, quality of life (Forman et al., 2012) and other mental health-related variables (Bond et al., 2011; Fresco et al., 2007a). Second, cognitive (de)fusion as measured by DDS, CFQ and other measures, mediated treatment gains of ACT, cognitive therapy and mindfulness interventions. For example, gains in cognitive defusion were related to improved psychological functioning (Forman et al., 2012), reduced levels of depression-related dysfunctional attitudes, anxiety sensitivity and negative affect (Tanay et al.,

2012) and other mental health-related treatment gains (Hesser et al., 2009; Zettle, Rains, & Hayes, 2011).

In a second set of studies, cognitive defusion was targeted experimentally or therapeutically using ACT defusion techniques, and its effects inferred vis-à-vis change in theoretically-relevant outcomes. In one of these techniques, the Word Repeating Technique (WRT), a person is asked to quickly and repeatedly say a distress-evoking and emotionally relevant word over and over, until she/he experiences that verbal statement as only a series of sounds void of meaning, and thereby its automatic effect on behavior is reduced (Bassett & Warne, 1919; Hayes et al., 1999a, 2012). WRT is thus designed to induce reduced-reactivity to thought content. Compared to various active control conditions, the WRT significantly reduced discomfort and believability ratings of negative self-referential thoughts (De Young, Lavender, Washington, Looby, & Anderson, 2010; Masuda et al., 2010a; see also Masuda, Hayes, Sackett, & Twohig, 2004; Masuda, Feinstein, Wendell, & Sheehan, 2010b), as well as obsessive compulsive disorder-related negative responses to contamination-related thoughts (Watson, Burley, & Purdon, 2010). Furthermore, a number of experimental studies have demonstrated superior outcomes of ACT defusion techniques, relative to other cognitive control strategies (e.g., distraction, expressive suppression), with respect to pain believability and coping with experimentally induced pain (Gutiérrez, Luciano, Rodríguez, & Fink, 2004; Hayes et al., 1999b; Healy et al., 2008; McMullen et al., 2008; Páez-Blarrina et al., 2008a; Páez-Blarrina et al., 2008b).

In total, this body of findings demonstrates the role of cognitive (de)fusion in mental health; in addition, this work suggests that defusion may, in part, mediate the effects of several types of interventions on these outcomes. In so far as the measurements and manipulations of

cognitive defusion represent the meta-cognitive processes of meta-awareness and disidentification from internal experience (via the DDS), as well as reduced-reactivity to thought content (via the CFQ and WRT), these studies provide additional evidence of the association between our meta-cognitive processes and mental health.

Self-As-Context

Conceptualization. The construct of self-as-object was introduced in early Rational Emotive Behavior Therapy, in which the self is conceptualized as an abstraction a person develops composed of her/his “attributes, capacities, objects and activities” (Coopersmith, 1967, p. 20). Building on this understanding of the self, an inverse construct called *self-as-context* was defined as a perspective in which, “the self is held as the background, the context or backdrop, out of which what the person has or does emerge” (Grieger, 1985; p. 84). Hayes and Wilson (1994) refer to self-as-context as a therapeutic target of ACT and conceptualize it as a perspective that enables a person to, “separate thoughts, emotions, and other private events from the person having them” (p. 294). With respect to our meta-cognitive processes model of decentering, self-as-context reflects disidentification from internal experience (the contents of consciousness), but is also characterized by a concomitant identification with consciousness or awareness itself (Hayes et al., 2012).

Empirical links to meta-cognitive processes model. One study investigated the effects of experimental manipulations of self-as-context on reactivity to negative self-referential thought content (Foody, Barnes-Holmes, Barnes-Holmes, & Luciano, 2013). This study used two self-as-context manipulations inducing meta-awareness and disidentification from internal experience. One of these manipulations, referred to as ‘hierarchical self-as-context’, also elicited a construal of self as hierarchically above experience (“imagine yourself so big that you have room for all of

these thoughts and feelings”; Foody et al., 2013, p. 378). Following both self-as-context manipulations, participants exhibited reduced believability in negative self-referential thought content, as well as reduced efforts to distract themselves from these thoughts (Foody et al., 2013). Only participants in the hierarchical self-as-context condition showed reduced self-rated stress in reaction to these thoughts (Foody et al., 2013). Consistent with our meta-cognitive processes model, these preliminary findings indicate that meta-awareness and disidentification from internal experience may, together, elicit reduced-reactivity to thought content.

Empirical links to mental health. In one study, among adolescents with high impulsivity or emotional symptoms, only the hierarchical self-as-context manipulation led to reduced problematic behaviors and psychological inflexibility, and elevated acceptance of experience without judgment (Luciano et al., 2011). These preliminary findings indicate that self-as-context may be linked to variables associated with mental health.

Self-Distanced Perspective

Conceptualization. Self-distanced perspective is grounded in social and cognitive psychology theories, including construal level theory and psychological distance (Liberman & Trope, 2008; Trope & Liberman, 2010). It is theorized that what distinguishes the degree to which self-reflection on negative events is adaptive or maladaptive is the degree to which that reflection is characterized by a self-distanced, rather than self-immersed perspective (Kross et al., 2005; Kross & Ayduk, 2009). In a *self-immersed perspective*, a person focuses primarily on recounting the concrete details (cf. abstract recalling) of their past experience (i.e., adopting a ‘what’ perspective; Mischel, Shoda, & Rodriguez, 1989; Trope & Liberman, 2003). In contrast, from a self-distanced perspective, a person takes “a step back when thinking about past experiences and reasons about them from the perspective of a distanced observer, akin to a fly on

the wall” (i.e., adopting a ‘why’ analytic perspective; Kross & Ayduk, 2011, p. 187). Thus, with respect to our meta-cognitive processes model, self-distanced perspective reflects disidentification from internal experience. Notably, self-distanced perspective does not reflect meta-awareness in so far as it entails reflection focused on thought content concerning past events, and not toward one’s current subjective experience.

Empirical links to meta-cognitive processes model. Research on self-distanced and self-immersed perspectives has focused on laboratory-based experimental manipulation of these putative psychological phenomena. Several of these studies have explored the effects of self-distanced perspective while thinking about past negative experiences. These studies have used a paradigm wherein participants are asked to recall an intense negative experience (e.g., an event involving sadness or anger) and then cued to analyze the event from either a self-immersed or a self-distanced perspective (Kross, 2009). Findings show that relative to a self-immersed perspective, adopting a self-distanced perspective while analyzing negative autobiographical memories causes reduced emotional reactivity when analyzing these memories (Kross & Ayduk, 2009; Kross, Duckworth, Ayduk, Tsukayama, & Mischel, 2011). Furthermore, depressed participants who analyzed their feeling from a self-distanced perspective, relative to a self-immersed perspective, demonstrated lower levels of depressive thought accessibility and negative affect (Kross, Gard, Deldin, Clifton, & Ayduk, 2012). Moreover, recalling an experience of anger from a self-distanced perspective, relative to a self-immersed perspective, was associated with lower cognitive accessibility of anger-related thoughts (Ayduk & Kross, 2010), reduced blood pressure reactivity (total peripheral resistance), faster recovery (Ayduk & Kross, 2008, 2010), as well as reduced levels of cortisol (see also Denson, Fabiansson, Creswell, & Pedersen, 2009). Thus, with respect to our meta-cognitive processes model, these findings

indicate that disidentification from internal experience induces reduced reactivity to thought content. Specifically, they show that disidentification from internal experience while thinking about past negative past events may be linked to reduced cognitive, emotional and physiological reactivity to these thoughts.

Empirical links to mental health. A well-developed experimental program of research has explored self-distanced perspective and its implications for psychological vulnerability and mental health (Ayduk & Kross, 2010; Kross & Ayduk, 2008, 2009; Kross et al., 2005). Findings show that relative to a self-immersed perspective, a self-distanced perspective is associated with lower levels of distress broadly (Kross & Ayduk, 2008; Kross & Ayduk, 2009; Kross et al., 2005). It is also associated, among various populations, with less recounting of and more reconstrual of one's experience (Kross et al., 2012), which lead to lower levels of depressed affect (Kross & Ayduk, 2008), and reduced blame of others involved in the event which in turn led to lesser emotional reactivity (Kross, Duckworth, Ayduk, Tsukayama, & Mischel, 2011). Other work has focused on spontaneous self-distancing, rather than experimentally manipulated self-distanced perspective. These findings suggest that when reflecting on negative experiences, greater self-reported levels of spontaneous self-distancing were related to lower levels of rumination and distress (Ayduk & Kross, 2010).

Finally, neuroimaging studies have shown that fostering a self-distanced perspective towards negative autobiographical memories is correlated with reduced activity in a network of the cortical midline region that, in other work, is linked to psychopathology including depression (Greicius et al., 2007; Kross, Davidson, Weber, & Ochsner, 2009; Mayberg, 2003; Whitfield-Gabrieli & Ford, 2012). In patient subgroups, activation of these cortical midline circuits coincides with: (a) inordinate negative self-referencing (e.g., rumination); and/or (b) an inability

to switch from this default mode network so as to engage task-positive networks; as well as (c) deficits in attention-demanding tasks and working memory capacity (e.g., Brewer et al., 2011; Whitfield-Gabrieli & Ford, 2012). A self-immersed perspective was correlated with activity in the medial prefrontal cortex associated with self-referential processing, as well as subgenual anterior cingulate cortex associated with emotion dysregulation (Kross et al., 2009). Thus, this body of findings supports the idea that disidentification from internal experience, as reflected by self-distanced perspective, is linked to mental health.

Summary of Conceptual Definitions and Empirical Findings

We reached a number of key conclusions about the conceptual (see Table 1) and empirical links between each decentering-related construct, the proposed meta-cognitive processes model and mental health outcomes. First, five of the decentering-related constructs – decentering, metacognitive awareness, cognitive distancing, metacognitive mode and detached mindfulness – are characterized by all three proposed meta-cognitive processes. Second, reperceiving is characterized by two of the meta-cognitive processes – meta-awareness and disidentification from internal experience. Third, cognitive defusion (Hayes et al., 2012) is characterized by reduced-reactivity to thought content; however, measures used to study the construct reflect reduced-reactivity (CFQ; Gillanders et al., 2014) as well as meta-awareness and disidentification from internal experience (DDS; Forman et al., 2012). Fourth, self-as-context and self-distanced perspective are each characterized only by disidentification from internal experience. Finally, mindfulness is characterized only by meta-awareness. From this perspective, our meta-cognitive processes model helps clarify both theoretical similarities and differences between decentering-related constructs.

Furthermore, as reviewed in detail above, a growing body of research supports various elements of the proposed meta-cognitive processes model of decentering. First, cutting across many of these literatures, numerous findings support the hypothesis that meta-awareness elicits disidentification with internal experience as well as reduced-reactivity to thought content. Furthermore, a growing body of findings support the hypothesis that disidentification from internal experience elicits reduced-reactivity to thought content. Finally, again cutting across the reviewed literatures, numerous findings support the hypothesis that the three proposed meta-cognitive processes contribute to mental health.

The review also highlights the variability in the scope and experimental rigor of research on decentering-related constructs. Indeed, though some constructs have been the focus of a developed experimental program of research (e.g., self-distanced perspective), others have received limited empirical study (e.g., cognitive distancing). The constructs that have been most extensively and rigorously tested, in no evaluative order, include: decentering/metacognitive awareness, mindfulness, cognitive (de)fusion and self-distanced perspective. First, decentering/metacognitive awareness has been the subject of scale construction (e.g., Fresco et al., 2007a), semistructured interview (Moore et al., 1996), initial validation studies (e.g., Orzech et al., 2009), as well as controlled intervention studies (Bieling et al., 2012; Fresco et al., 2007b). Second, mindfulness has been the subject of extensive scale construction (Bergomi, Tschacher, & Kupper, 2013; Park, Reilly-Spong, & Gross, 2013; Sauer et al., 2013), laboratory studies (e.g., Feldman et al., 2010), as well as controlled intervention studies (Hofmann et al., 2010). Third, cognitive (de)fusion has been the focus of scale construction (e.g., Gillanders et al., 2014; Forman et al., 2012), extensive laboratory study (Masuda et al., 2010a), and initial intervention study (Zettle et al., 2011). Fourth, self-distanced perspective has been the subject of extensive

laboratory study (e.g., Kross et al., 2011), observational cross-sectional and initial prospective study (Kross & Ayduk, 2009), as well as experimental study of its neural correlates (Kross et al., 2009), though it has not been the subject of measurement construction or intervention research. In contrast, the constructs of cognitive distancing, metacognitive mode/detached mindfulness, re-perceiving and self-as-context have not been the subject of the same degree of empirical study.

Future Directions

We organized the gaps in extant knowledge and corresponding future research of decentering and its related constructs in three domains: (a) conceptual and operational definitions; (b) neurobiological bases; and (c) relations and mechanisms of action.

Conceptual and Operational Definitions

Conceptual and empirical integration of constructs. Based on the present review, we conclude that research designed to transcend or cut across decentering-related constructs by elucidating their core meta-cognitive processes may be key to advancing this area of psychological science. In this spirit, we proposed three inter-related meta-cognitive processes of decentering-related constructs – meta-awareness, disidentification from internal experience, and reduced-reactivity to thought content (see Figure 1). We believe that focus on this common set of meta-cognitive processes will help illuminate the mental phenomenon of interest and its links to mental health.

Measurement of the constructs and component processes. Systematic research on the operational definition and measurement of decentering-related constructs, and their component processes, is needed. To-date, efforts have been largely limited to self-report measurement (see Table 2 for details) and inference of change in a construct (e.g., self-distancing, cognitive defusion) as a function of an experimental manipulation intended to target that construct.

Laboratory-based behavioral measurement is lacking. Such measurement methods are important to move the field beyond reliance on self-report measures, and towards biobehavioral or performance-based indices of decentering. Moreover, we believe that measurement development should more systematically focus on the theorized meta-cognitive processes that subservise the phenomenon (i.e., meta-awareness, disidentification from internal experience, and reduced-reactivity to thought content).

Trait and/or state. Some work has conceptualized decentering and related constructs largely as traits (Forman et al., 2012; Fresco et al., 2007a; Gillanders et al., 2014; Moore et al., 1996); yet other work has related to them as states (Kross et al., 2005; Lau et al., 2006; Masuda et al., 2010a). In the proposed meta-cognitive processes model of decentering we primarily conceptualize the processes sub-serving these constructs as mental states. However, we speculate that if activated repeatedly in time and across contexts, expression of these meta-cognitive processes may grow more stable or trait-like. Systematic study of these constructs as a states and traits/dispositions may have important implications for developing a better understanding of these constructs and their meta-cognitive processes.

Neurobiological Bases

Neurocognitive processes. We propose that it may be useful to attempt to map the proposed meta-cognitive processes underlying decentering in terms of basic neurocognitive processes, and specifically those subserving meta-cognitive processes (e.g., executive functions, cognitive control, attention, self-referential processing; see Kross & Ayduk, 2011 for initial efforts to do so). It may furthermore be useful to first map the specific neurocognitive processes in healthy persons, and subsequently among persons expressing psychopathology or at-risk for psychopathology. This approach may help delineate patterns of dysfunction in the

neurocognitive mechanism(s) underlying decentering that may help us more precisely understand how this mental phenomenon and its component processes facilitate or impair adaptation.

Neural substrates. Neuroimaging study of the neural substrates of decentering, and specifically its component meta-cognitive processes, may be key to advancing understanding of this phenomenon. We therefore highlight human neuroscience that we believe is particularly relevant to this aim. First, a growing body of neuroimaging study has focused on meta-awareness of mind-wandering (Schooler, 2002; Smallwood & Schooler, 2006). Particularly relevant to our focus, a recent self-caught experience sampling study conducted on meditation practitioners found that meta-awareness of mind wandering was linked to activity in the bilateral anterior insula and dorsal anterior cingulate cortex (ACC; Hasenkamp, Wilson-Mendenhall, Duncan, & Barsalou, 2012). These areas are associated with salience network brain regions (Seeley et al., 2007) that may be key to supporting meta-awareness. Furthermore, during mind wandering *without* meta-awareness, the posterior cingulate cortex (PCC), medial prefrontal cortex (PFC), posterior parietal/temporal cortex and parahippocampal gyrus of the default mode network were activated (Hasenkamp et al., 2012). A similar experience sampling study of mind-wandering among non-meditators showed that mind wandering with low levels of meta-awareness was also associated with greater activity in default mode regions and executive control regions associated with ‘off-task thinking,’ including the medial and lateral anterior PFC, dorsal ACC, right dorsolateral PFC, PCC and precuneus (Christoff, Gordon, Smallwood, Smith, & Schooler, 2009). Some of these regions overlap with brain areas implicated in self-referential processing (i.e., the process of associating exteroceptive, interoceptive and mental stimuli with one’s own self; Northoff et al., 2006). We propose that this brain circuitry may subserve not only the lack of meta-awareness, but also identification with internal experience. Specifically we propose that

identification with internal experience is characterized by neural associations of internal experience with the self, and is thus linked to activation in default mode network / cortical midline structures subserving self-referential processing (Northoff & Bermpohl, 2004; Northoff et al., 2006).

Work by Farb and colleagues (2007) explored the neural substrate of two modes of self-awareness, which they termed experiential-focus and narrative-focus, in the context of a mindfulness-based intervention. They defined experiential-focus as a present-centered, mindful mode that is closely related to the meta-cognitive process of meta-awareness in our model. In contrast, the authors defined ‘narrative focus’ as the default mode of mind characterized by “cognitive elaboration of mental events, thereby reducing attention towards other temporally proximal sensory objects” (Farb et al., 2007, p. 314). First, experiential focus was associated with increased activation of a lateralized network (ventral and dorsolateral PFC, right insula, secondary somatosensory area, and inferior parietal lobule), a network that might therefore subserve meta-awareness. Second, experiential focus was associated with reduced activation of cortical midline regions in the mPFC associated with self-referential processing. Accordingly, we suggest that this pattern of activation might be linked to disidentification from internal experience. Third, functional connectivity analyses revealed coupling between the right insula and the vmPFC during experiential focus in meditation-novices that was decoupled in the mindfulness intervention group (Farb et al., 2007). We propose that this decoupling between vmPFC regions supporting cognitive-affective representations of the self, and the right insula supporting viscerosomatic signals (Farb et al., 2007), may be linked to disidentification from internal experience, specifically, bodily sensations. The authors explain that the patterns of activation during experiential focus in the mindfulness intervention group support a more self-

detached and objective analysis of interoceptive and exteroceptive sensory events, rather than their affective or subjective self-referential value. Furthermore, they proposed that this detached or objective mode of self-focus may be aided by the recruitment of the right angular gyrus of the inferior parietal lobule, involved in switching between first and third-person perspectives (Farb et al., 2007). In so far as a third-person perspective on internal experience is key to disidentification from internal experience, the right angular gyrus might also be important to this meta-cognitive process of decentering.

Kross and colleagues (2009) have begun to elucidate the neural mechanisms associated with adopting a self-distanced perspective on distressing memories. Relative to a self-immersed perspective, when participants were prompted to think about feelings elicited by a distressing memory from a self-distanced perspective, they evidenced less activation of cortical midline structures associated with self-referential processing (i.e., medial prefrontal cortex, posterior cingulate, and precuneus; Northoff et al., 2006) and regions subserving emotion (dys)regulation more broadly (i.e., subgenual cingulate cortex, Ressler & Mayberg, 2007) (Kross et al., 2009). Together, these findings are consistent with the aforementioned findings regarding default mode network / cortical midline structures, and point to their role as neural substrate of identification with negative feelings and memories. Moreover, regulating emotional responses to erotic video clips by adopting a self-distanced perspective (i.e., distance yourself from these stimuli, that is, to become a detached observer), was associated with less amygdala activity relative to a passive attending condition (Beauregard, Levesque, & Bourgouin, 2001). Findings from both of these studies suggest that self-distanced perspective is also linked to reduced activation in neural regions associated with emotional reactivity (i.e., subgenual cingulate cortex and amygdala). Thus, decreased activation in these and related neural areas in response to manipulation of

thought content, may be important neural substrate of reduced (emotional) reactivity to thought content – a meta-cognitive process that we propose is key to decentering. Taken together, these studies may represent the first steps toward identifying the neural correlates of the meta-cognitive processes of decentering.

Relations and Mechanisms of Action

Psychological distance. A well-established experimental literature has evaluated the phenomenon of temporal and spatial psychological distance (Lieberman & Trope, 2008). Yet, of the reviewed constructs here, only the self-distancing literature is directly linked to this body of scholarship (Kross et al., 2005). Theorizing and empirical methods of psychological distance and of its impact on cognitive processes (e.g., abstract versus concrete thought), grounded in Construal Level Theory (Trope & Liberman, 2010), may be particularly important to understanding decentering and its proposed component meta-cognitive processes. Accordingly, we speculate that psychological distance might be particularly relevant to the process of disidentification from internal experience. Indeed, disidentification from internal experience entails adopting a third-person perspective in reference to internal experience, and the creation of mental distance between internal experience and the self.

Cognitive re-appraisal and related processes. Given that decentering is purported to serve an emotion regulatory function, it may be important to consider if and how it is qualitatively different from or related to other known emotion-regulation strategies (e.g., cognitive reappraisal; Gross, 1998). Of particular importance, future work may evaluate whether decentering may be necessary for, or facilitate, re-appraisal and -interpretation of one's experience. In terms of the proposed meta-cognitive processes model of decentering, this might be a consequence of reduced-reactivity to the initial appraisal of the situation, enabling the

formation of a different re-appraisal of the situation. Another possibility is that disidentification from internal experience may, in and of itself, without subsequent re-appraisal or -interpretation, facilitate a different “primary” appraisal or interpretation of one’s experience (Safran & Segal, 1990).

Self-awareness. Relations between decentering and knowledge about one’s self may represent an important understudied area of inquiry. Morin characterizes self-awareness as a “complex multidimensional phenomenon that comprises various self-domains and corollaries” (2011, p. 808). From this perspective, various constructs such as meta-awareness, theory of mind, autobiographical memories, and prospection about one’s future are linked to or subsumed by self-awareness. Accordingly, we speculate that decentering, and specifically meta-awareness, could contribute to the development of self-knowledge or -awareness. Future work may begin to bridge these theoretical traditions and literatures, and begin to more directly test their relations.

Mental health mechanisms. We lack knowledge of the mechanism(s) through which decentering may contribute to risk and resilience of various forms of suffering such as mood and anxiety psychopathology. The proposed meta-cognitive processes model may help inform such work. Multiple, mutually-inclusive mechanisms may be explored, for example: (1) meta-awareness may lead to (a) greater awareness of how internal events act as setting events for (un)wanted behaviors or subjective states, and (b) greater emotional differentiation and clarity; (2) disidentification from internal experience may lead to (a) greater tolerance of distress and negative emotions, and (b) reduced self-referential thought; and (3) reduced-reactivity to thought content may lead to (a) reduced automaticity and greater behavioral choice, and (b) improved emotional recovery following distress.

Psychological intervention process. Limited research has evaluated the degree to which decentering and its component processes may account for therapeutic change across a range of psychological interventions. Extant research is largely circumscribed to mindfulness-based interventions. Nevertheless, a number of intervention approaches purport to therapeutically function vis-à-vis decentering and related constructs (e.g., Beck et al., 1979; Hayes et al., 1999a, 2012; Teasdale et al., 2002; Wells, 2000). We theorize that, whether explicitly intended or not, the meta-cognitive processes of decentering may in part mediate the psychotherapeutic effects of a large number of interventions. Systematic study of this possibility may be particularly promising.

Disorder-specificity or transdiagnosticity. Limited research has evaluated the degree to which impairment(s) in decentering and its meta-cognitive processes may be conceptualized as a transdiagnostic factor relevant to psychopathology broadly, or may be more specifically relevant to certain conditions such as mood disorders. Such research is clinically important. Study of the role(s) of low levels of the meta-cognitive processes of decentering with respect to the development and maintenance of prevalent mental disorders, and their multimorbidity, may be particularly promising. This knowledge is important to guide prevention and intervention efforts targeting decentering (Zvolensky, Schmidt, Bernstein, & Keough, 2006).

Context and flexibility. There has been very little study of the contextual factors that may moderate the degree to which decentering and its meta-cognitive processes are (mal)adaptive (e.g., Aldao, 2013). One possibility is that decentering is functionally adaptive in a universal manner. That is, across various internal (e.g., thoughts) and external (e.g., situations) contexts, decentering and its meta-cognitive processes may be functionally adaptive. Alternatively, and we theorize that it may be more likely its adaptive function may depend on the

capacity to flexibly engage, in a context-sensitive manner, in meta-awareness, disidentification from internal experience and reduced-reactivity to thought content. For example, it may be the case that in the instance of fight-flight responding to a threatening event, decentering may be maladaptive; whereas upon recall and reflection on such an event, decentering may be adaptive. As another example, in the context of a 'positive' thought (e.g., creative idea), reduced-reactivity to thought content may be maladaptive, whereas meta-awareness of that 'positive' thought may be adaptive. These are largely open empirical questions (Aldao & Nolen-Hoeksema, 2012; Sheppes, Scheibe, Suri, & Gross, 2011). Furthermore, this type of contextualized understanding of decentering may be clinically relevant as well. Decentering may be paradoxically maladaptive in the context of exposure therapies and efforts to activate emotional engagement and thereby promote extinction learning (e.g., Foa & Kozak, 1986). However, developing the capacity to decenter outside of the exposure exercises themselves may be key to the efficacy of such interventions.

Development. Limited empirical study has focused on the developmental process and acquisition of decentering or its meta-cognitive processes. Seminal cognitive development theory referred to the emergence of a meta-cognitive experiential shift somewhat similar to that referred to in the decentering-related literatures (Inhelder & Piaget, 1958). Hayes and colleagues (1999a, 2012) discussed the development of cognitive fusion and self-as-context during language development from the perspective of Relational Frame Theory. Empirical developmental research, however, is lacking. Development of various forms of social cognition may be particularly important for the development of decentering and its meta-cognitive processes. Such work may consider the developmental role of perspective taking, empathy, or mentalization (e.g.,

Fonagy, Gergely, Jurist, & Target, 2002) for better understanding the development of decentering.

Summary

In this paper we argue that, to varying degrees, decentering-related constructs reflect a common mental phenomenon. We characterize this phenomenon through a novel *Meta-Cognitive Processes Model of Decentering* which elucidates three meta-cognitive processes – meta-awareness, disidentification from internal experience, and reduced-reactivity to thought content – that transcend and differentiate between these constructs. We critically review the theoretical and empirical literature of decentering-related constructs, and link each construct to the proposed meta-cognitive processes model and to mental health. Based on the proposed meta-cognitive processes model, we propose future directions for research on the conceptual and operational definitions of decentering, its neurobiological bases, and its relations to other constructs and mechanisms of action. We conclude that research designed to transcend decentering-related constructs by focusing on their core meta-cognitive processes may be key to advancing the field's understanding of this facet of human experience and its role in (mal)adaptation.

Footnotes

a. *Study Selection Criteria and Terminology.* To select empirical studies relevant to the constructs and proposed meta-cognitive processes, we reviewed the literature using search terms that we theorized reflect the phenomenon of interested. Using PsychINFO (items published between January 1840 and May 2013), MEDLINE (items published between 1966 and May 2013) and Google Scholar, we searched databases, abstracts, and article titles containing the following search terms, in alphabetical order: (1) cognitive defusion; (2) cognitive de-fusion; (3) cognitive fusion; (4) cognitive distance / cognitive-distance; (5) decentering / de-centering / decentring / de-centring; (6) deliteralization; (7) metaconsciousness; (8) detached mindfulness; (9) disidentification; (10) fly on the wall; (11) meta-cognitive awareness / metacognitive awareness; (12) meta-awareness / meta awareness / metaawareness; (13) metacognitive mode / meta-cognitive mode; (14) psycholog* distanc*; (15) reflective processing; (16) re-perceiv* / re-perceiv*; (17) self distancing / self-distancing / self distanced analysis; (18) self-distanced perspective / self distanced perspective; (19) self-immersed perspective / self immersed perspective; (20) self-as-context / self-as-context . The search yielded approximately 1874 article hits in total. 88 of these articles were retained as a function of their relevance to the description of the decentering-related constructs, following review of the title, abstract, and body of the manuscripts.

b. In order to link the empirical literature on each of the decentering-related constructs to our meta-cognitive processes model, we first highlight how measurements of these constructs are associated to each of the meta-cognitive processes in our model. This is important in so far as it

helps to interpret the relevance of extant findings not only with respect to the construct broadly, but with respect to the specific measured meta-cognitive process(es) more specifically.

c. The scientific literature on measurements of mindfulness is too expansive to be reviewed in this article (for comprehensive reviews please refer to Bergomi et al., 2013; Park et al., 2013; Sauer et al., 2013). To the best of our knowledge, no measures have been reported in the published literature with respect to self-distanced perspective, self-as-context, or re-perceiving.

d. In another effort to measure and study detached mindfulness, Sugiura (2004) attempted to operationalize detached mindfulness by proxy of a concept he introduced, detached objectivity, using the Receptiveness sub-scale of Sakairi's (2004) *Scale of Meditation-Related Cognitive Styles (SMCS)*. In addition, the *Meta-Cognitions Questionnaire (MCQ)*; Cartwright-Hatton & Wells, 1997; Wells & Cartwright-Hatton, 2004) may be related to metacognitive and object modes. However, the MCQ and MCQ-30 measure meta-cognitive beliefs, primarily about worry (e.g., positive beliefs about worry, beliefs about uncontrollability and danger), and not metacognitive or objective modes per se.

Table 1

Decentering-Related Constructs and the Proposed Meta-Cognitive Processes of Decentering

Decentering-Related Constructs	Meta-Cognitive Processes		
	Meta-Awareness	Disidentification from Internal Experience	Reduced-Reactivity to Thought Content
Decentering (Safran & Segal, 1990)	X	X	X
Metacognitive Awareness (Teasdale et al., 2002)	X	X	X
Cognitive Distancing (Beck et al., 1979)	X	X	X
Metacognitive Mode (Wells, 2000)	X	X	X
Detached Mindfulness (Wells, 2005)	X	X	X
Reperceiving (Shapiro et al., 2006)	X	X	
Mindfulness (Bishop et al., 2004)	X		
Cognitive Defusion (Hayes et al., 2012)			X
Self-as-Context (Hayes et al., 2012)		X	
Self-Distanced Perspective (Kross et al., 2005)		X	

Note. An X above denotes that the decentering-related construct involves the particular meta-cognitive process from the proposed model

Table 2

Measurements of Decentering-Related Constructs^c

<p>Decentering</p> <p><i>Experiences Questionnaire - Decentering subscale</i> (EQ; Fresco et al. 2007a)</p> <p><i>Toronto Mindfulness Scale - Decentering subscale</i> (TMS; Lau et al., 2006)</p>	<ul style="list-style-type: none"> • The ability to “step outside of one’s immediate experience, thereby changing the very nature of that experience” (Safran & Segal, 1990, p. 117). • Measures trait-level capacity to take a meta-cognitively detached or observant perspective of one’s thoughts and emotions (e.g., “I can separate myself from my thoughts and feelings”, “I view things from a wider perspective”). • 20-item self-report scale, 11-item Decentering subscale. • 7-point Likert-type scale (<i>1 = never to 7 = all the time</i>). • A state measure of "awareness of one’s experience with some distance and disidentification rather than being carried away by one’s thoughts and feelings" (Lau et al., 2006, p. 1452; e.g., “I experienced myself as separate from my changing thoughts and feelings”). • 13-item self-report scale, 7-item Decentering subscale. • 4-point Likert-type scale (<i>0 = not at all to 4 = very much</i>).
<p>Metacognitive Awareness</p> <p><i>Measure of Awareness and Coping in Autobiographical Memory</i> (MACAM; Moore et al., 1996)</p> <p><i>Metacognitive Awareness Questionnaire</i> (MAQ; Teasdale et al., 2001)</p>	<ul style="list-style-type: none"> • A meta-cognitive monitoring process which enables one to decenter from thoughts, and thereby view thoughts as events in the mind rather than reflections of external reality or of one’s self (Segal et al., 2002, 2013). • Qualitative index of metacognitive awareness of autobiographical memories elicited by depressive cues based on a linguistic coding scheme. • Participants are given 8 tape-recorded descriptions of mildly depressing scenarios, recorded in a flat depressing tone of voice, and are instructed “to put themselves into the situations and to feel the feeling described” (Teasdale, et al., 2002, p. 277). • Participants describe their first (autobiographical) memory elicited by the vignette, and their original response to the recalled memory. • The interviewer/rater codes the metacognitive-awareness shown at the time of the original event using a scale of 1 to 5 according to a coding manual. • Measures metacognitive awareness to thoughts and feelings when sad or depressed (e.g., “When I get low, my feelings show things in their true light”, “I can't trust my judgments about myself when I feel down”). • 9-item self-report scale. • 7-point Likert-type scale (<i>1 = totally agree to 7 = totally disagree</i>).

<p><i>Cognitive Distancing</i></p> <p><i>Beck Cognitive Insight Scale</i> (BCIS; Beck, Baruch, Balter, Steer, & Warman, 2004)</p>	<ul style="list-style-type: none"> • A ‘switch process’ into a metacognitive mode, that permits a person to engage with maladaptive cognitions, and out of an automatic mode in which such maladaptive cognitions go unmonitored and lead to maladaptive behavior (Ingram & Hollon, 1986). * To the best of our knowledge, no self-report measure of cognitive distancing as a general psychological or therapeutic process has been developed. • Based on conceptual model of insight in psychoticism characterized by “distancing, objectivity, perspective, and self-correction” (Beck et al., 2004, p. 319). • 2 sub-scales: self-reflectiveness and self-certainty of the interpretations of subjective experiences. • 15-item self-report scale. • 4-point Likert-type scale (<i>0 = do not agree at all to 3 = agree completely</i>).
<p><i>Metacognitive Mode & Detached Mindfulness</i>^d</p> <p><i>The Self-Reflection and Insight Scale</i> (SRIS; Grant et al., 2002)</p>	<ul style="list-style-type: none"> • <i>Metacognitive mode</i> is a psychological state in which, “thoughts can be consciously observed as separate events from the self and the world... individual's relationship to thoughts is one of standing back and observing them as part of a greater multifaceted landscape of conscious experience” (Wells, 2011, p. 8). Detached mindfulness is “an objective awareness of a thought or belief,... the disengagement of any conceptual or coping based activity in response to the thought and... separating the conscious experience of self from the thought” (Wells, 2011, p. 8). * To the best of our knowledge, no comprehensive self-report measure of megacognitive mode has been developed. • Measures <i>detached mindfulness</i> or inspection, evaluation, and understanding of one’s own thoughts, feelings, and behaviors. • Based on <i>Private Self-Consciousness Scale</i> (PrSCS; Fenigstein, Scheier, & Buss, 1975). • 2 subscales: the self-reflection (SRIS-SR) and insight (SRIS-IN) sub-scales. • 20-item self-report measure. • 6-point Likert-type scale (<i>1 = strongly disagree to 6 = strongly agree</i>).
<p><i>Cognitive (De)fusion</i></p> <p><i>Drexel Defusion Scale</i> (DDS; Forman et al., 2012)</p> <p><i>Cognitive Fusion Questionnaire</i></p>	<ul style="list-style-type: none"> • Psychological process that enables “one to see thoughts and feelings for what they are (i.e., a verbally entangled process of minding) rather than what they advertise themselves to be (e.g., the world understood; structured reality)” (Hayes et al., 1999a, p. 150). • Measures ability to achieve psychological distance from 10 unpleasant internal experiences (e.g., “Imagine you are having a thought such as ‘no one likes me’”, “Imagine that you lose out on something you really wanted”). • 10-item self-report scale. • 6-point Likert-type scale (<i>0 = not at all to 5 = very much</i>). • Measures cognitive fusion defined as “the tendency for behavior to be overly regulated and influenced by

(CFQ; Gillanders et al., 2014)

cognition” (Gillanders et al., 2014, p. 84; e.g., “I struggle with my thoughts”, “My thoughts cause me distress or emotional pain”).

- 7-item self-report scale.
- 7-point Likert-type scale (*1 = never to 7 = all the time*).

*Automatic Thoughts
Questionnaire - Believability
Scale* (ATQ-B; Zettle & Hayes,
1986)

- Measures frequency and degree of believability of negative thoughts associated with depression (e.g., “I feel like I’m up against the world”, “I’m a failure”).
- Grounded in theorizing that degree of believability in one’s negative cognitions reflects fusion.
- 30-item self-report scale.
- 5-point Likert-type scale (*1 = not at all to 5 = all the time*).

*Acceptance and Defusion
Process Measure* (ADPM;
Hesser et al., 2009)

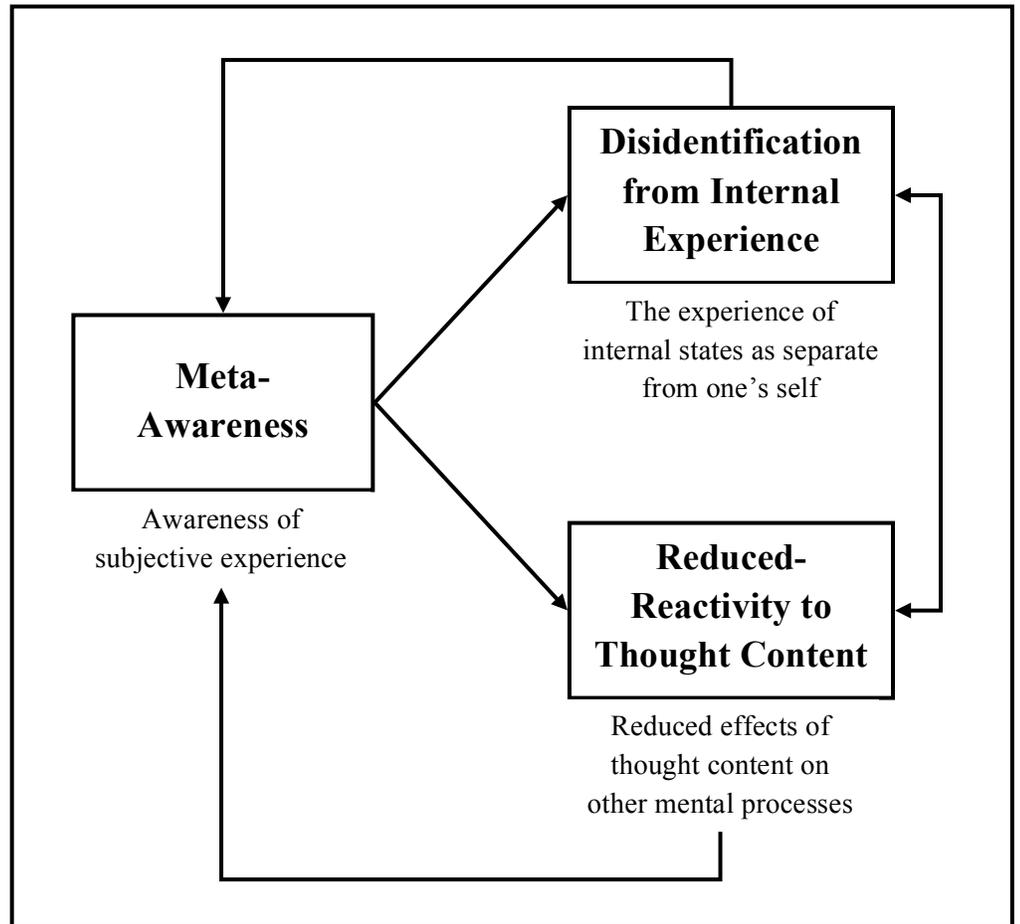
- Qualitative index of acceptance and defusion based on a system of coding verbal statements made by patients over the course of Acceptance and Commitment Therapy.
- A defusion behavior is defined as a verbal statement wherein the participant/client notices, labels and separates her/his self from a private experience (e.g., a thought, feeling).
- Defusion behaviors are rated on a 5-point scale.
- ADPM is circumscribed to the measurement of fusion within the context of Acceptance and Commitment Therapy.

*Psychological Inflexibility in
Pain Scale – Cognitive fusion
subscale* (PIPS; Wicksell,
Renöfält, Olsson, Bond, &
Melin, 2008)

- Measures psychological flexibility, including cognitive fusion, specifically related to pain (e.g., “It is important to understand what causes my pain”, “I need to understand what is wrong in order to move on”).
 - 16-item self-report scale, 6-item cognitive fusion subscale.
 - 7-point Likert-type scale (*1 = never true to 7 = always true*).
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Figure 1

The Meta-Cognitive Processes Model of Decentering



Note. Meta-awareness initiates disidentification from internal experience and reduced-reactivity to thought content, which in turn affect one another, and feedback to reinforce meta-awareness.

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