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Putting Feelings Into Words: Affect Labeling as Implicit Emotion Regulation

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Abstract

Putting feelings into words, or "affect labeling," can attenuate our emotional experiences. However, unlike explicit emotion regulation techniques, affect labeling may not even feel like a regulatory process as it occurs. Nevertheless, research investigating affect labeling has found it produces a pattern of effects like those seen during explicit emotion regulation, suggesting affect labeling is a form of implicit emotion regulation. In this review, we will outline research on affect labeling, comparing it to reappraisal, a form of explicit emotion regulation, along four major domains of effects—experiential, autonomic, neural, and behavioral—that establish it as a form of implicit emotion regulation. This review will then speculate on possible mechanisms driving affect labeling effects and other remaining unanswered questions.

Keywords
affect labeling, emotion regulation, implicit

When we think about emotion regulation, we likely think of a process that requires effort, whether physical or mental, that "removes" us in some way from the cause of our emotion. We might avert our eyes from a gruesome car crash or try convincing ourselves it isn't as bad as it looks. Successful emotion regulation might be thought of as an escape from something that elicits an emotional response in us, eliminating our feelings by avoiding or changing the way we think about the eliciting stimulus. We probably would not think that focusing on our feelings without trying to change them could achieve the same effect. Emerging evidence depicts a surprising kind of emotion regulation: putting feelings into words, an act called "affect labeling," can itself be a form of implicit emotion regulation. This notion about the benefits of talking about our feelings has existed in various forms including therapy (Esterling, L'Abate, Murray, & Pennebaker, 1999; Greenberg, 2002) and expressive writing (Pennebaker, 1993; Pennebaker & Beall, 1986). Only over the past decade has affect labeling been focused upon specifically as a potential form of emotion regulation and tested within the lab.

Talking about our feelings or using emotional language to describe what upsets us does not necessarily feel like an exercise in emotion regulation. So how can we know if it is? One way is to see if engaging this behavior regulates emotional responses. When an individual experiences an emotion, it elicits loosely connected responses across experiential, physiological, and behavioral domains (Levenson, 2003; Mauss, Levenson, McCarter, Wilhelm, & Gross, 2005). Emotion regulation is often conceptually defined as a manipulation of the quality, duration, or intensity of an emotion (Gross, 1998b; Gross & Thompson, 2007; Koole & Rothermund, 2011), which can be measured from emotion-related outputs in the aforementioned domains. A process engaged by an individual which necessarily modulates these primary channels of emotional output should be considered a kind of emotion regulation.

In this review, we will first establish the emotion regulatory effects of affect labeling by comparing it to a more well-studied form of emotion regulation, reappraisal, and discuss its merits as an implicit form of emotion regulation. Building from the extant research on affect labeling effects, we speculate on possible mechanisms through which affect labeling may operate. Finally, we highlight remaining open questions about affect labeling.

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Emotion Regulatory Effects of Affect Labeling

To demonstrate an accepted pattern of emotion regulation effects, we turn first to a characterization of the well-studied form of emotion regulation "reappraisal." One form of reappraisal is the reinterpretation of an emotionally evocative stimulus in order to alter its emotional impact (Gross, 1998a). In the examples of emotion regulation provided earlier, convincing ourselves a car accident isn't as bad as it looks is an attempt at reappraisal; we have initially appraised the wreck as potentially lethal or injurious to those involved and have reinterpreted the observed damage as hopefully cosmetic. Reappraisal has two major variations: "reinterpretation" wherein an evocative stimulus is reinterpreted to alter its emotional impact and "distancing" wherein an individual reduces the relevance of an evocative stimulus to themselves. For this manuscript, we will be discussing primarily the reinterpretation form of reappraisal though in any cases arguments will apply to both variants. In line with the domains of emotion effects listed before, engagement of reappraisal through reinterpretation can alter subjective experience of an emotion as measured through self-report (Blechert, Sheppes, Di Tella, Williams, & Gross, 2012; Kalisch et al., 2005; McRae, Ciesielski, & Gross, 2012; McRae, Jacobs, Ray, John, & Gross, 2012; Ray, McRae, Ochsner, & Gross, 2010); autonomic arousal (Kalisch et al., 2005; Kim & Hamann, 2012; McRae, Ciesielski, et al., 2012; Ray et al., 2010; Urry, van Reekum, Johnstone, & Davidson, 2009); and through observation of emotion-related behaviors such as overt physical expression of emotion (Gross, 1998a, 2002), risk-taking (Park & Lee, 2011), and reaction times during interpersonal evaluation (Blechert et al., 2012). In the neural domain, several meta-analyses of neural activations during reappraisal through reinterpretation each identified the following prefrontal regions often associated with cognitive control as more active during emotion regulation via reappraisal through reinterpretation: ventrolateral prefrontal cortex (vlPFC), dorsolateral prefrontal cortex (dlPFC), supplementary motor area (SMA), and anterior cingulate cortex (ACC; Buhle et al., 2014; Diekhof, Geier, Falkai, & Gruber, 2011; Frank et al., 2014; Kalisch, 2009; Kohn et al., 2014). Of these meta-analyses, those that looked at deactivations due to reappraisal through reinterpretation also found significant reductions in amygdala activation, a region associated with emotion generation. Some evidence points specifically to the inhibitory role of vlPFC in reappraisal (Golkar et al., 2012; Ochsner, Silvers, & Buhle, 2012), emotion regulation (Berkman & Lieberman, 2009; Hooker & Knight, 2006), and self-control more broadly (Cohen, Berkman, & Lieberman, 2012; Cohen & Lieberman, 2010; Tabibnia et al., 2014; Tabibnia et al., 2011), as well as the inverse relationship between vlPFC activity and amygdala activity during reappraisal through reinterpretation (Banks, Eddy, Angstadt, Nathan, & Phan, 2007; Ochsner, Bunge, Gross, & Gabrieli, 2002).

Like reappraisal, the term "affect labeling" also describes a collection of related variations. As the research discussed in this section will show, affect labeling can involve labeling one's own feelings (e.g., "I feel angry") or labeling the emotionally evocative aspect of an affecting stimulus (e.g., "That person looks angry" or "That is blood"). It can be engaged by speaking, writing, or even selecting among provided affect labels. To date, there has been almost no research aimed at disentangling these different kinds of affect labeling (cf. McRae, Taitano, & Lane, 2010). However, regardless of the specific form affect labeling takes, research on affect labeling has demonstrated a modulation of emotional output effects in the same experiential, autonomic, neural, and behavioral domains as found in other forms of emotion regulation.

Experiential Consequences of Affect Labeling

It is unknown to what extent using self-report to measure the effects of verbalizing an emotional experience is itself an affect-labeling manipulation and may reduce our ability to observe effects that use self-report. Despite this, when participants apply affect labeling to emotionally charged stimuli, they tend to report diminished levels of affect compared to conditions that do not engage affect-labeling-related processing. When asked to label either observed emotional states in others or emotionally evocative objects, affect labeling significantly reduced distress in response to aversive images as well as pleasant feelings in response to positive images reported by participants when compared to viewing the stimuli without labeling. Interestingly, distress reduction from affect labeling was positively correlated within participants with distress reduction from reappraisal (Lieberman, Inagaki, Tabibnia, & Crockett, 2011). Labeling one's own emotional state also produced distress reductions during affect labeling which again correlated with distress reductions during reappraisal (Burklund, Creswell, Irwin, & Lieberman, 2014). Finally, labeling the emotion depicted in images has also been shown to reduce self-reported experience of negative valence and arousal from aversive images; reduce self-reported experience of positive valence within pleasant images; reduce self-reported physical symptoms after viewing negative images (Constantinou, Bogaerts, van Diest, & van den Bergh, 2013; Constantinou et al., 2015; Constantinou, van Den Houte, Bogaerts, van Diest, & van den Bergh, 2014); as well as reduce self-reported experience of sadness when rating images of evocative stimuli as either "pleasant," "neutral," or "unpleasant" (S. F. Taylor, Phan, Decker, & Liberzon, 2003). Though this may not always be the case (cf. Matejka et al., 2013), within the domain of subjective experience of emotion, affect labeling can diminish feelings of both positive and negative affect and these reductions within individuals correlate with similar reductions from reappraisal.

Autonomic Consequences of Affect Labeling

Though there may not be consensus on precisely what profiles of specific emotions look like in the autonomic domain, it is generally accepted that the experience of emotional events produces a measurable autonomic signal (Ekman, Levenson, & Friesen, 1983; Kragel & LaBar, 2014; Kreibig, 2010; Levenson, 2003) that is tethered to other measures of emotional reactance (Daubenmier, Hayden, Chang, & Epel, 2014; Mauss et al.,

2005; Yang et al., 2007) and can be altered via emotion regulation processes (Gross, 2015).

Affect labeling has demonstrated two kinds of autonomic reductions: immediate and delayed effects. In several cases, affect labeling produced immediate reduction of autonomic responses to an emotional event. Rating anger felt on a scale after emotional induction demonstrated an autonomic profile of reduced emotional reactivity including decreased heart rate, decreased cardiac output, and increased total peripheral resistance (Kassam & Mendes, 2013), which is suggestive of movement away from a state of anger (Mendes, Major, McCoy, & Blascovich, 2008). Verbalizing an emotional experience prompted by negative images, compared to stating facts about an experience, decreased skin conductance responses and voice pitch, indicating lower arousal (Matejka et al., 2013). When comparing the application of subjective affect labels (i.e., words describing one's own emotional state) against objective affect labels (i.e., words describing the eliciting stimulus) to aversive images, skin conductance responses showed more reduction during the application of objective affect labels (McRae, Taitano, et al., 2010).

In other cases, autonomic effects of affect labeling are not immediately evident but exhibit a longer term delayed effect. Participants who viewed an aversive film and spoke about their emotions demonstrated increased physiological responses (lower skin temperature and higher skin conductance) in an initial session, but showed reduced physiological responses and increased self-reported positive affect 48 hours later when viewing the film a second time (Mendolia & Kleck, 1993). Participants who were shown images of spiders demonstrated decreased skin conductance 8 days later when shown these same stimuli but only when images were initially presented with negative word labels (Tabibnia, Lieberman, & Craske, 2008). Similarly, patients with clinically diagnosed arachnophobia who engaged in affect labeling during an initial session with a live, caged tarantula present demonstrated greater decreases in skin conductance response during a second session 1 week later compared to patients who engaged in distraction, reappraisal, or mere exposure alone (Kircanski, Lieberman, & Craske, 2012). Importantly, for patients assigned to the affect-labeling condition in this study, the more negative affect words used by the patient, the greater the reduction in skin conductance as well as the more progress made in the exposure therapy during the second session 1 week later. Finally, combining affect labeling with exposure produced greater reductions in skin conductance responses over the course of an 8-day procedure for patients with public speaking anxiety, compared to exposure alone (Niles, Craske, Lieberman, & Hur, 2015).

Neural Consequences of Affect Labeling

Affect labeling has been shown to elicit increased vlPFC and decreased amygdala activity compared to other conditions which also require processing an evocative stimulus but importantly do not require labeling affect, such as gender labeling (Burklund, Craske, Taylor, & Lieberman, 2015; Lieberman et al., 2007; S. E. Taylor, Eisenberger, Saxbe, Lehman, & Lieberman, 2006), affect matching (Hariri, Bookheimer, & Mazziotta, 2000; Payer, Baicy, Lieberman, & London, 2012; Payer, Lieberman, & London, 2011), and passive observation of expressive faces (S. F. Taylor et al., 2003) or aversive scenes (Burklund et al., 2014). A meta-analysis of amygdala activity across a variety of tasks reported labeling emotions observed within evocative stimuli yields significantly decreased odds of amygdala activity relative to passively viewing those stimuli (Costafreda, Brammer, David, & Fu, 2008). Additionally, patients with brain lesions were significantly impaired in their ability to track the emotional state of a film character using a dial with labels from "extremely negative" to "extremely positive" to the extent they had a damaged right vlPFC (Goodkind et al., 2012), suggesting necessary involvement of vlPFC in the affect-labeling process. Reported negative connectivity between vlPFC and amygdala while participants perform an affect-labeling task (Foland et al., 2008; Hariri et al., 2000; Lieberman et al., 2007; Payer et al., 2012; Payer et al., 2011; S. E. Taylor et al., 2006) suggests the two regions are in close communication during affect labeling. Importantly, using dynamic causal modeling, increased output from vlPFC (and not other prefrontal regions) was identified as the cause of decreased amygdala activity during affect labeling further suggesting the role of vlPFC in the down-regulation of amygdala responsiveness (Torrisi, Lieberman, Bookheimer, & Altshuler, 2013).

Behavioral Consequences of Affect Labeling

Emotions are functional and often prepare us both mentally and physically to take certain actions (Frijda, 1986; Levenson, 1999). If emotional states are altered, then we would expect downstream behavioral effects which arise from these emotions to be altered as well. Affect labeling encouraged greater progress through exposure therapy for patients with a clinical fear of spiders (e.g., moving physically closer to the spider) compared to reappraisal, distraction, or exposure alone (Kircanski et al., 2012); decreased independently rated observations of difficulty describing emotional experience and tension in response to watching an aversive film (Mendolia & Kleck, 1993); decreased observed levels of anxiety by the parents of adolescent girls who used electronic diaries to log their emotional states (Morelen, Jacob, Suveg, Jones, & Thomassin, 2013); and increased test performance for students who wrote about their test-related anxieties before taking a math test (Ramirez & Beilock, 2011).

Affect Labeling as Implicit Emotion Regulation

Affect labeling has demonstrated a profile of regulatory effects that very closely resembles more widely accepted forms of emotion regulation, specifically reappraisal, despite seeming unlikely. In fact, people tend to have a strong lay theory that affect labeling shouldn't work at all. When asked on a trial-by-trial basis how much distress they would feel in response to an aversive image, participants correctly predicted that they would feel *less* distress if they engaged in reappraisal but incorrectly

predicted that they would feel *more* distress if they engaged in affect labeling, even when making these predictions after themselves reporting reduced distress during an actual affect labeling task (Lieberman et al., 2011). Individuals are largely unaware of the regulatory effects of affect labeling and allow these strong lay theories of how emotion regulation *ought* to work countermand their actual experiences with it. This impressive failure to accurately predict the direction of regulatory effects from affect labeling has an interesting implication for its placement within the larger emotion regulation literature. A defining characteristic of implicit emotion regulation is that it does not require conscious supervision or explicit intention, yet still alters an emotional experience (Koole & Rothermund, 2011). Given that individuals seem to believe affect labeling performs precisely the opposite to how it does, intent to regulate one's emotions is not required for affect labeling to be effective and can operate even without a regulatory goal present. However, implicit forms of emotion regulation are also often thought not to require effort to deploy as is the case with habituation, fear extinction, or emotional conflict adaptation (Gyurak, Gross, & Etkin, 2011). Although it does not require intent to regulate an emotional experience for it to be effective, affect labeling is not effortless as it does require a conscious conversion of either the internal emotional experience or the external evocative stimulus into a linguistic symbol. In this way, affect labeling might feel like an explicit process because of the effort required, but its counterintuitive effects as a regulatory process without conscious awareness suggest it is indeed a form of emotion regulation, albeit an implicit one (Gyurak & Etkin, 2014).

Possible Mechanisms of Affect Labeling

A major focus of the work on affect labeling thus far has been to establish if there is indeed a regulatory effect elicited. Mechanisms of affect labeling have not yet been directly investigated and as such our understanding of the critical processes involved remains a matter of speculation. In this section, we will outline a few possible candidates and discuss their merit as underlying mechanisms of affect labeling.

Distraction

A claim could be made that affect labeling operates via distraction; requiring application of language to an evocative stimulus momentarily distracts us from fully processing and engaging the stimulus as we would have otherwise, thus resulting in diminished effects. This account seems reasonable considering some evidence comparing affect labeling to distraction. Regulatory effects on self-reported distress of affect labeling and distraction did not differ significantly when compared directly (Lieberman et al., 2011). Additionally, successful distraction depends upon a similar profile of neural mechanisms as both reappraisal and affect labeling such as the vlPFC, SMA, and ACC, and yields reduced amygdala activity as well (McRae, Hughes, et al., 2010). However, for several reasons, this account seems unlikely. Many studies have compared affect labeling to gender labeling, another condition which requires a similar amount of attention diverted from the evocative stimulus towards a label choice presented simultaneously. However, gender labeling does not show the same regulatory effects as affect labeling (Burklund et al., 2015; Lieberman et al., 2007; S. E. Taylor et al., 2006), which begins to suggest that simple distraction may not be sufficient explanation. Also, since emotion words have been shown to activate the amygdala (Straube, Sauer, & Miltner, 2011), we might even expect to see increased activation of amygdala in affect-labeling trials instead of the decreased activation that is consistently demonstrated. Further, affect labeling was significantly more effective than distraction during exposure therapy (Kircanski et al., 2012). If affect labeling effects were driven entirely by a distraction-related mechanism, we would not expect them to differ. Moreover, if affect labeling did operate by means of distraction, it becomes especially difficult to explain the time-delayed effects of affect labeling described earlier, especially in clinical studies. Distraction is cited as an impediment in the treatment of anxiety disorders, whereas affect labeling demonstrates long-term benefits in clinical contexts (Craske, Street, & Barlow, 1989; Grayson, Foa, & Steketee, 1982). Rather than considered a distraction, processing words during presentation of an evocative stimulus may be considered by some a kind of interference instead. However, we believe the evidence presented, especially that of the comparing effects of affect labeling to gender labeling, makes interference a similarly unlikely mechanism through which affect labeling fully operates.

Self-Reflection

To put our feelings into words we must first identify what those feelings are, requiring a degree of self-reflection. Being aware of and observing our own experiences, especially emotional experiences, is a primary feature of dispositional mindfulness (Baer, 2004), which has been linked to affect-labeling ability: individuals who exhibit higher levels of dispositional mindfulness also show stronger neural activations during affect labeling in several key areas including vlPFC and dlPFC, as well as greater decreases in amygdala, activations which suggest a more robust and effective neural response to affect labeling as a function of dispositional mindfulness (Creswell, Way, Eisenberger, & Lieberman, 2007). Emotional introspection, without explicit processing through language, has itself been shown to have a neural profile similar to what we would expect from successful emotion regulation: increased activity in vlPFC and decreased activity in amygdala (Herwig, Kaffenberger, Jäncke, & Brühl, 2010). With this evidence in mind, the important component in affect labeling could be self-reflection upon our emotions while the translation of these feelings into language may only serve to initiate the introspection process or as an external indicator that the self-reflection occurred. It might not be about language per se, but the steps required to get there. For example, an interesting line of work investigates the role of self-distancing in emotion regulation through self-reflection (Kross & Ayduk, 2017). This is particularly interesting given the focus of distancing as a major component in reappraisal as well.

It is, however, difficult to explain affect labeling effects through self-referential processes when applied to externally

focused stimuli, for example when we label the emotional expression in a face or the most aversive component within a depicted scene. Focusing on emotions within the self and emotions within others share many common neural substrates (Ochsner et al., 2004) though not all. It is possible that applying affect labels to the self and to others rely upon different underlying processes to operate, however it is also possible that the application of affect labels to external stimuli leans upon understanding of our own emotional experiences. In this way, application of affect labels to external stimuli may activate the same self-referential processes as when applied to internal stimuli. Exploring the dichotomy between internally focused and externally focused affect labeling and the potential overlaps between them remains an important avenue of future exploration, which may shed light upon the role self-referential processes play in affect labeling. If self-referential processes are critically involved, what then might this mean for emotional responses that are naturally more self-focused like shame and embarrassment? We might expect that if affect labeling works by engaging self-referential processes, then emotional events that are already highly self-focused may not see this additional benefit. One study discussed earlier, which looked at both anger and shame, showed affect labeling reduced feelings of anger but not feelings of shame (Kassam & Mendes, 2013). Though it is problematic to extrapolate from a single null finding, corroborating findings may suggest activation of self-referential processes is important to obtaining the regulatory effects we expect from affect labeling.

Reduction of Uncertainty

Emotions can often be nebulous feeling states. By applying a label to those states, or even to evocative but ambiguous stimuli, we may be reducing our uncertainty about them by categorizing them. It has been suggested that reduction of uncertainty may be the process through which affect labeling operates (Lindquist, Gendron, & Satpute, 2016; Lindquist, Satpute, & Gendron, 2015). As the originators of this theory point out, this may also help explain the amygdale-related findings in affect-labeling research, as the amygdala responds to uncertainty of stimuli (Whalen, 2007). However, further research is required to understand what role uncertainty might play in generating signals across the other emotion output domains. For example, are distress ratings or autonomic reactions also indicators of uncertainty in stimuli? If uncertainty is the underlying cause of the emotion being regulated, then we may very well see other channels of emotional output attenuated by reduction of this uncertainty. Uncertainty as the cause of an emotion seems likely for emotions like fear and anxiety, but less likely for other emotions such as anger or sadness (Smith & Ellsworth, 1985), both of which affect labeling has been shown to reduce (Kassam & Mendes, 2013; S. F. Taylor, Liberzon, & Koeppe, 2000).

Symbolic Conversion

Affect labeling may also operate through abstraction by using language to convert stimuli into a symbolic representation. Several studies have shown that when affect labels are replaced with more abstract labels of superordinate categories, we see a similar profile of effects. Participants who applied abstract "content labels" (e.g., "object," "animal," "human," "landscape") to aversive stimuli demonstrated a similar effectiveness in reducing self-reported affect as the affect-labeling condition (Constantinou et al., 2015; Constantinou et al., 2014). When participants classified pictures of aversive and threatening stimuli as either "natural" or "artificial" in origin, vlPFC activity increased, limbic activity in the amygdala decreased (Hariri, Mattay, Tessitore, Fera, & Weinberger, 2003), as did skin conductance responses (Tupak et al., 2014). Additionally, heightened amygdala activity viewing African American faces was reduced when the label "African American" was applied to the images (Lieberman, Hariri, Jarcho, Eisenberger, & Bookheimer, 2005). Interestingly, abstract thinking has been linked to activity in vlPFC (Bunge, Kahn, Wallis, Miller, & Wagner, 2003) and is critical in processing the meaning of abstract words (Hoffman, Jefferies, & Lambon Ralph, 2010). Abstract thinking about the causes of emotional states has also been suggested as an important component of reflecting upon feelings without increasing their negative impact, and as potentially important feature distinguishing harmful rumination from helpful self-reflection (Kross, Ayduk, & Mischel, 2005). It has been previously suggested (Wood, Lupyan, & Niedenthal, 2016) that converting the evocative stimulus to language is an act of categorization, allowing conscious exploration of the stimulus and causes, and signaling that the challenge has been dealt with. One may consider that once the higher processing prefrontal regions of the brain have the emotional information in symbolic format, there is no additional utility in having the alarm (e.g., amygdala) continue to signal for attention.

Symbolic conversion of the eliciting stimulus into affect language is an important component in affect labeling, though we do not rule out that certain nonaffect labels may be similarly effective. Thinking abstractly of one's emotions or of evocative stimuli through language more generally, thus inducing symbolic conversion via language, could also allow individuals to diminish their emotional experiences regardless of specifically processing the affective aspects of the stimulus. Perhaps abstraction of the stimulus through language removes an individual from the details or diminishes the immediate relevance of the evocative stimulus in a way that encourages psychological distancing, which has been shown to reduce negative affect through distancing language (Nook, Schleider, & Somerville, 2017).

Further Considerations

Beyond understanding the mechanisms driving affect-labeling effects, many unanswered questions remain that require attention from future research. As interest and research in affect labeling grows, especially within the clinical domain, it becomes important to understand the limitations of affect labeling as an effective form of emotion regulation and acknowledge possible moderators and boundary conditions beyond which affect labeling may no longer be as effective. Further, understanding under what conditions affect labeling can and cannot operate may help

identify the mechanisms which drive the effects and uncover ways to optimize the paradigm.

As described in the section on Autonomic Consequences of Affect Labeling, some paradigms of affect-labeling tasks report delayed longer term effect without immediate reductions in affect-related signal, while other single-session paradigms did show immediate reductions. Interestingly, nearly all studies reporting only delayed effects required participants to self-generate the affect labels themselves rather than have them provided (e.g., describing felt emotions as they occur compared to selecting provided affect labels from word choices on a screen), while none of the studies reporting immediate decreases did. In fact, the only reported case where affect labeling significantly *increased* self-reported affect or autonomic arousal during the initial exposure also required participants to self-generate and verbalize their emotional experiences (Mendolia & Kleck, 1993; Ortner, 2015). Similarly, expressive writing, which often involves participants writing about emotions surrounding negative past events with relatively little instruction otherwise, also demonstrates long-term benefits up to months later, though it may also leave individuals feeling more negative affect immediately after writing sessions (Baikie & Wilhelm, 2005; Esterling et al., 1999). Seemingly, when participants are provided affect labels to use, emotion regulation effects from affect labeling are observed immediately; however, when participants are required to self-generate the affect labels, emotion regulation effects are delayed and may even serve to temporarily increase reaction to the emotionally evocative stimulus. But the reason for this dichotomy remains unknown and, as of yet, untested. It could be that being provided labels is simply easier, reducing the choice space, making the labels more accessible, or even reducing need for introspection, any of which could possibly allow for individuals to more easily regulate their emotional responses in the moment. It is also possible that having labels provided encourages a kind of interpersonal emotion regulation process (Zaki & Williams, 2013) as the labels were provided by another individual (in these cases, the experimenter) and act as tacit signal of support or validation of the choices being made. It may also be that while self-generating labels may be more difficult and less effective in the immediate situation, those labels are ultimately more relevant to the individual generating them and lead to longer lasting effects as seen in expressive writing paradigms.

As with any new topic of inquiry, a host of similar questions remain unanswered about affect labeling. Earlier it was mentioned that affect labeling describes applying labels to our own feelings, the feelings of others, or emotionally evocative objects. Differences among these kinds of affect labeling are largely unknown as to date and investigation of these differences presents a significant opportunity to understand more about affect labeling. In fact, we know of only one study which has attempted to identify differences among any of these types of affect labeling (McRae, Taitano, et al., 2010), which found that under certain conditions, such as duration of exposure and type of stimulus, labeling the object is more effective at reducing autonomic response than labeling one's own feelings. Given the number of variables within this study, it is obvious that there may be many more important dimensions to affect labeling than have been studied and understood thus far.

Additionally, some evidence suggests that using more affect-labeling words leads to better outcomes (Kircanski et al., 2012), yet other research demonstrated a curvilinear relationship suggesting that some usage of affect labels is beneficial but using none or using too many may be detrimental (Niles, Byrne Haltom, Lieberman, Hur, & Stanton, 2016). Is there such thing as an overusage of affect labeling? Or perhaps the issue is with the intensity of the emotion in question and a failure to regulate through affect labeling no matter how frequently it is applied.

It has been shown in reappraisal that at higher levels of intensity, individuals prefer to engage in alternate regulation strategies like distraction (Shafir, Thiruchselvam, Suri, Gross, & Sheppes, 2016; Sheppes, Scheibe, Suri, & Gross, 2011). How does the intensity of affect impact affect-labeling success? Several of the delayed time effects discussed earlier were found in clinical populations. By the very definition of a phobia, targeting the specific phobias of clinical patients may induce a higher intensity affective response than is typically seen in everyday life. Might this also help explain why immediate reductions were not seen? What role does choice have in affect labeling as an emotion regulation strategy when lay theories suggest it shouldn't be effective?

Are some individuals better suited to using affect labeling than others? Emotional granularity is our ability to distinguish and understand our emotional states at a higher level (Barrett, Mesquita, Ochsner, & Gross, 2007; Smidt & Suvak, 2015). Because some forms of affect labeling rely on awareness of internal emotional states, would individuals who are better able to identify the specifics of their emotions, including perhaps what caused them, benefit more from affect labeling? Or would individuals with less understanding and awareness of their emotional states benefit more? If aiding the conscious appraisal and understanding of an emotional state is how affect labeling operates, then perhaps provided affect labels may be more advantageous to individuals with less emotional granularity.

Throughout this review, we have demonstrated the number of effects that affect labeling has on primary domains of emotional responding, a profile shared by more explicit forms of emotion regulation, reappraisal in particular. We have discussed research in which affect labeling demonstrates reduced self-reported affect; reduced autonomic activity; activation of a nearly identical profile of neural regions such as increased activity in prefrontal control regions (especially vlPFC) along with decreased emotion-generative activity in the amygdala; and reduced emotion-related behavioral effects. We then considered how, despite the effort involved in converting perception of an emotion state or aversive stimulus into language, the regulatory effects of affect labeling are counterintuitive and unexpected and seem to operate outside awareness marking it as a form of implicit emotion regulation. Finally, we speculated on a number of possible mechanisms through which affect labeling may operate. Research on affect labeling as a form of implicit

emotion regulation is still in its nascent stages; as research moves away from the basic finding that affect labeling can reduce emotional experiences, we will begin to see a clearer picture of how and why affect labeling works.

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