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Rethinking How We Think About Cognitive Interventions for Depression: An Example From Research on Second-Language Acquisition

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Abstract
One of the primary goals of cognitive therapy for depression is to teach an individual a new, more adaptive way of thinking about stressful life experiences. We argue that this process of supplanting a deeply engrained way of negative thinking with a more adaptive style of thinking is similar to learning a second language. The purpose of this article was to use a second-language acquisition framework to evaluate the strategies typically used in cognitive therapy for changing depressogenic cognitive patterns and to propose new strategies that may make the therapy more effective.

Keywords
cognitive therapy, CBT, language, depression

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The cognitive theories of depression are among the most well-supported models of depression (e.g., Abramson, Metalsky, & Alloy, 1989; Beck, 1967; Nolen-Hoeksema & Morrow, 1991). According to these theories, some individuals have a cognitive vulnerability that interacts with stress to produce depression. Specifically, people are vulnerable to depression because they have a tendency to generate interpretations of stressful life events that have overly negative implications for their future and for their self-worth.

Research to date has provided strong support for the cognitive vulnerability hypothesis (see reviews by Haeffel et al., 2008; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Prospective studies have found that individuals with high levels of cognitive vulnerability are more likely to develop depressive symptoms and depressive disorders than individuals with low levels of cognitive vulnerability. Impressively, these studies (e.g., Abramson et al., 1999; Alloy et al., 2006) have shown that it is possible to take a group of individuals who have never been depressed and predict which of them are at greatest risk for developing a first onset of depression solely on the basis of individual differences in their cognitive style for interpreting life events (i.e., their level of cognitive vulnerability). This research establishes temporal precedence and suggests that cognitive vulnerability may be a causal contributor to depression.

A strength of the cognitive model of depression is the ease with which it lends itself to prevention and treatment interventions. According to the cognitive theories, depression can be prevented and treated if cognitive vulnerability is decreased. Thus, a central goal of many depression interventions is to reduce an individual's cognitive vulnerability, a process typically referred to as *cognitive restructuring*. People are taught to identify negative cognitions, evaluate them, and then generate more adaptive cognitions. Research shows that cognitive interventions (e.g., cognitive behavioral therapy, or CBT) are as effective as any other intervention available (including medication) for preventing and treating depression (Hollon, Stewart, & Strunk, 2006; Hollon, Thase, & Markowitz, 2002). Additionally, CBT (which is time limited) has a relapse-prevention effect

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that is at least as enduring as the continuation of medication (Dobson et al., 2008; Hollon et al., 2006). Thus, cognitive interventions are often considered a first-line treatment of depression and the gold standard comparison for new interventions.

Although CBT is effective, a closer look at the literature reveals that it is not a panacea. Meta-analyses show that whereas effect sizes for CBT (and antidepressant medications) continue to be large, the initial estimates were likely overestimated because of publication bias and the inclusion of lower quality studies (Cuijpers et al., 2013; Cuijpers, Smit, Bohlmeijer, Hollon, & Andersson, 2010; Hollon, 2016). As Hollon (2016) stated, "It is not that they do not work; just that they do not work as well as the published literature would lead one to believe" (p. 295). Research shows that a majority of patients (40%–60%; Vittengl et al., 2016; Waltman, Creed, & Beck, 2016) benefit from CBT, but only one third experience a full remission from depression (Hollon et al., 2002; Waltman et al., 2016). And, of those who experience a full remission, more than one quarter of them will relapse within 2 years (Hollon et al., 2002; Jarrett, Minhajuddin, Gershenfeld, Friedman, & Thase, 2013; Vittengl, Clark, Dunn, & Jarrett, 2007; Vittengl & Jarrett, 2015). Furthermore, a modeling exercise by Andrews, Issakidis, Sanderson, Corry, and Lapsley (2004) found that if every individual with depression received an empirically supported treatment such as CBT, it would avert only 34% of the global burden of the depression (i.e., years lived with disability). Taken together, these results highlight the need to improve interventions for depression, as nearly half of those treated by our best intervention continue to experience depression (Cuijpers, 2015; Cuijpers, Andersson, Donker, & van Straten, 2011; Cuijpers et al., 2013; Hollon, 2016).

We theorized that cognitive therapy for depression could be made more effective if the strategies used to alter cognitive vulnerability were improved. The general strategies used in individual and group cognitive therapy to alter cognitive vulnerability have remained largely unchanged in the 50 years since their inception (e.g., Barlow, 2014; Beck, 1967; Young, Weinberger, & Beck, 2001). A combination of psychoeducation, thought experiments, and homework (e.g., thought-record worksheets) is used to teach people how to identify and dispute negative thoughts. Using didactic instruction, patients are taught the cognitive model with an emphasis on how one's thoughts can influence one's mood. Patients learn that when negative thoughts are changed, then negative moods, behaviors, and even neurochemistry and brain activation patterns also change. Patients also learn how they may be distorting their interpretations of life events to be consistent with their negative views of their self and future. In light of this model, patients begin the process of trying to alter their cognitive vulnerability with the help of their therapists. Patients are first taught to identify and rate their moods. As patients become adept at monitoring their moods, they then can notice when negative emotional shifts occur. When these shifts take place, patients are taught to attend to their automatic thoughts. Specifically, patients are to identify the accompanying negative automatic thoughts that preceded and accompanied the negative change in mood. These negative automatic thoughts are the focus of cognitive restructuring. The restructuring process is a deliberate process by which patients evaluate and challenge the veracity of their negative automatic thoughts. This is done with thought and behavior experiments. Perhaps the most common technique is for participants to evaluate the evidence for and against their negative automatic thought (this is often done using a thought-record worksheet). After weighing the evidence, they then try to generate a more realistic or less extreme cognitive response. These skills are taught and practiced both in-session with the therapist as well as outside of therapy via homework.

This general approach to altering cognitive vulnerability by identifying, evaluating, and rethinking cognitive responses to life events was developed and popularized by legendary therapists such as Aaron Beck and Albert Ellis via their clinical experiences. The result of their groundbreaking work is a cognitive therapeutic strategy that makes intuitive sense and is easy for patients and therapists to understand. With that said, the existing approach is not based on empirical research regarding the best approaches for altering entrenched cognitive patterns. This raises the following question: If a group of cognitive scientists were asked how best to change a deeply engrained pattern of thinking such as cognitive vulnerability, would they come up with a process similar to that currently used in most forms of cognitive therapy? We believe the answer would be "no." The current strategies to change cognitive vulnerability are not optimal and may, in some contexts, have the potential to backfire (e.g., Baert, De Raedt, Schacht, & Koster, 2010; Daches, Mor, & Hertel, 2015; Haeffel, 2010; Haeffel, Hames, & Technow, 2012). The purpose of the current article was to use research from second-language learning as one example of how basic research in cognitive psychology can be used to improve the efficacy of CBT for depression. We begin with a discussion of the relationship between patterns of language and patterns of thought, which is at the core of cognitive therapy approaches to cognitive vulnerability. We then consider how the acquisition of a second language can provide ideas about improving cognitive therapy to treat depression. Finally, we discuss some limits on how second-language learning can inform our thinking about cognitive therapy.

Language, Thought, and Cognitive Vulnerability

The use of language is a central part of our existence. Hardly a moment goes by when we are not engaged with language in some manner, whether it be having a conversation, reading, writing, or thinking to ourselves. Language is the primary vehicle through which we think about the events of our lives, and the language that we speak has an impact on our conceptualization of, and memory for, those events. The impact of language on thought and memory has been shown in a number of domains: eyewitness memory (e.g., Loftus & Palmer, 1974), categorization and memory for color (e.g., Winawer et al., 2007), the conceptualization of space (e.g., Levinson, 1996) and time (e.g., Boroditsky & Gaby, 2010), and the perception of emotion (e.g., Barrett, Lindquist, & Gendron, 2007). Consider the experiments reported by Fausey and Boroditsky (2011) as one example of this work. Participants watched videos depicting events that occurred intentionally (a person is playing with a balloon and purposely pops it) or by accident (a person is playing with a balloon, and it pops spontaneously). English speakers are likely to describe both events as, "The person popped the balloon"; in other words, an agent is coded regardless of the intention behind the act. Spanish speakers code the intentional popping of the balloon as, "The person popped the balloon," but they describe the accidental popping of the balloon as, "The balloon broke itself." That is, Spanish speakers code the event differently on the basis of the intention of the actor. In a subsequent test of the participants' memory for the pairing of actors and events, Spanish speakers were less likely than English speakers to remember the actor when the balloon popped by accident. Thus, different conceptualizations of the balloon-popping event caused by the differences between English and Spanish affect what is later remembered about the event.

Slobin's (1996, 2003) thinking-for-speaking hypothesis provides an explanation for how languages shape memory and thought. Languages differ in the nature and amount of information that is needed to describe events and relationships in the world (e.g., English and Spanish differ in the need to code the actor for an accidental event; Fausey & Boroditsky, 2011). As languages are acquired, speakers must learn to attend to particular information in order to communicate about actions and events in an appropriate way. By repeatedly attending to particular elements of an event when preparing to speak about that event (i.e., by thinking for speaking), the speaker develops deeply engrained, habitual ways of observing, remembering, and communicating about the world.

Like the patterns of thought created by repeatedly expressing ideas in a given language, cognitive vulnerability is a deeply engrained pattern of thinking. We propose that cognitive vulnerability can be conceptualized as one's "native language" for interpreting life stress, in the sense that habitual patterns of describing events (e.g., coding events to focus on the negative) lead to downstream consequences in terms of how subsequent events are conceptualized and remembered. Similar to one's native language, early social contexts have a strong influence on the development of cognitive vulnerability. Many researchers have converged on the idea that early exposure to negative interpersonal contexts is a particularly influential antecedent of cognitive vulnerability. Both negative parenting practices (e.g., emotional abuse) and direct inferential feedback from significant others (e.g., teachers, peers, and parents) predict future cognitive vulnerability levels (e.g., Alloy et al., 2001; Cole, Jacquez, & Maschman, 2001; Dweck, Davidson, Nelson, & Enna, 1978; Garber & Flynn, 2001; Lau, Belli, Gregory, Napolitano, & Eley, 2012; Murray, Woolgar, Cooper, & Hipwell, 2001). By early adolescence, it is possible to detect meaningful and stable individual differences in how individuals think about stressful life events (Cole et al., 2008; Nolen-Hoeksema, Girgus, & Seligman, 1992). Once an individual's "language" forms and stabilizes, it confers risk for depression throughout the life span (for a review, see Romens, Abramson, & Alloy, 2009). Research shows that cognitive vulnerability exhibits moderate to high stability during high school (Hankin & Abramson, 2002), college (Alloy et al., 2000), and the rest of adulthood (Burns & Seligman, 1989; Haeffel et al., 2005).

Given the environmental influences during early development and trait-like stability throughout the life span, cognitive vulnerability can be thought of as one's native language for interpreting life stress, particularly with regard to giving individuals habitual patterns of thought that shape their conceptualization of their world. Thus, the challenge faced by cognitive therapists becomes apparent: How can someone effectively learn a second, more adaptive language for thinking about life stress?

Second-Language Acquisition

Our proposal is that cognitive vulnerability functions as a sort of native language for individuals at risk for depression and that successful CBT for depression might be viewed as being akin to the acquisition of a second language. In other words, CBT can be seen as the acquisition of a new, habitual way of coding the events of one's life (or, in Slobin's, 1996, terms, a new way of *thinking for speaking*). It is well documented

that adults struggle to acquire second languages (e.g., Flege, 1999; Johnson & Newport, 1989). Part of the struggle arises from the fact that the second-language learner must acquire new conventions for communication (e.g., new speech sounds, words, and syntactic forms), and the learner may experience negative transfer between his or her native language (L1) and the second language (L2; e.g., MacWhinney, 2005). Another part of the struggle arises from the fact that L1 is active and competing with L2 during the acquisition process (e.g., Kroll, Sumutka, & Schwartz, 2005). Thus, even when the learner is using L2, his or her knowledge of L1 may be active and interfering with the learning and processing of L2.

It may be difficult for adults to acquire a second language with a high degree of proficiency, but there are factors that lead to more successful outcomes. One of these factors is taking part in an immersion experience, in which the learner is put in a context that requires the learner to rely heavily (if not exclusively) on his or her L2 (e.g., Freed, 1995; Freed, Segalowitz, & Dewey, 2004). Immersion experiences lead to better outcomes than other modes of second-language instruction (e.g., classroom instruction, study abroad programs; Freed et al., 2004) for at least two reasons. First, immersion experiences limit the time that the learner spends using L1. It has been demonstrated that limiting use of L1 is associated with better L2 outcomes (e.g., Flege, 1999; Flege, Frieda, & Nozawa, 1997; Piske, MacKay, & Flege, 2001). Furthermore, Linck, Kroll, and Sunderman (2009) suggested that immersion experiences may reduce the learner's access to L1 during processing. By limiting access to L1 (both in terms of use and in terms of activation during processing), immersion experiences provide a context for acquiring L2 in which interference from L1 is minimized. Second, immersion experiences provide the learner with a greater opportunity to produce his or her L2 in a variety of contexts. The additional time spent practicing L2 is an important factor in the successful acquisition of the language (e.g., Freed et al., 2004), just as having the opportunity to practice a new skill is a well-known predictor of the development of skilled and expert performance in a number of other domains (such as sports or music; see Ericsson, 2008).

Improving Cognitive Therapy for Depression

The study of second-language acquisition (SLA) demonstrates that the most successful outcomes in learning an L2 are associated with (a) immersive experiences that (b) restrict the learner's use of L1 and (c) provide ample opportunity to practice L2. Avoiding the use of L1 reduces access to the native language and promotes the learning of L2 by reducing interference from L1 (and reducing the need to translate from L1 to L2). This is the opposite of what occurs in cognitive therapy. Cognitive therapy teaches a deliberate and effortful process by which patients continually activate and explicitly evaluate their well-established native language/negative style (L1) while trying to learn the new, more adaptive language (L2).

Thus, one strategy for improving cognitive therapy is to limit the activation of the existing negative way of thinking and focus solely on generating adaptive cognitions. When people are asked to identify negative automatic thoughts, those negative cognitions are activated and strengthened in memory. This is counterproductive. When negative cognitions are strengthened, they become more accessible and require greater levels of cognitive control to suppress. Research on learning and cognitive change in domains as diverse as neurorehabilitation (e.g., Taub, Crago, & Uswatte, 1998) and problem solving (e.g., McNeil, Fyfe, Petersen, Dunwiddie, & Brletic-Shipley, 2011) suggests that the most effective way to promote cognitive change is to strengthen to-be-learned ideas without activating well-established, competing ideas. Thus, cognitive interventions should have patients practice generating adaptive cognitions without first identifying (and activating) negative cognitions. In other words, cognitive interventions should stop teaching participants to translate L1 (negative cognitions) to L2 (adaptive cognitions). The focus should be solely on learning L2.

Preliminary support for the claim that a focus on L2 might improve the results of CBT comes from a cognitive workbook intervention study reported by Haeffel (2010). The study tested the hypothesis that teaching people to generate adaptive cognitions without first activating negative cognitions would be more effective in preventing depressive symptoms than would traditional cognitive restructuring (i.e., identify negative thoughts, provide evidence for and against the negative thoughts, generate more adaptive thoughts). Undergraduates with high levels of cognitive vulnerability were randomly assigned to one of three cognitive workbook conditions (Haeffel, 2010). The first workbook taught traditional CBT skills with a focus on cognitive restructuring. In this workbook condition, participants were taught the typical sequence of activating L1 (negative cognitions) and then translating to L2 (adaptive cognitions). The second workbook was identical to the traditional workbook except that it did not require participants to identify and dispute negative cognitions. Instead, it had participants generate adaptive cognitions without first identifying (and activating) negative cognitions and, thus, was focused solely on learning L2 (with

no activation of L1). The third workbook was an active control condition in which participants were taught academic skills. Results showed that participants completing the nontraditional workbook (focused solely on L2) exhibited lower levels of depressive symptoms than participants completing the traditional workbook (translating L1 to L2). This pattern of results held post-intervention and 4 months later. These results are preliminary—replication is still needed, as is extension to samples with clinically significant depression—but they nonetheless hint at the possibility that a focus solely on adaptive cognitions (L2) can improve standard CBT approaches.

A second strategy from SLA research to be applied to cognitive therapy is the idea of immersion. Immersion benefits the learner by limiting access to L1 (as discussed above) and by providing ample opportunity to practice L2 skills. One strategy for helping with this is to surround the person with people who can provide adaptive thoughts for the person (similar to visiting a foreign country where everyone speaks L2). Doing so would reduce access to L1 (as the individual would not be hearing maladaptive thoughts as frequently) and would also provide the opportunity to practice using L2 through interaction with people who have a more adaptive approach to life events. Indeed, because cognitive vulnerability can be influenced by a social contagion effect (Haeffel & Hames, 2014), CBT for depression could capitalize on this by evaluating the patient's interpersonal context, including family, friends, and perhaps even the patient's social media network. The therapist could assess whether people in the patient's life are modeling and providing adaptive cognitive feedback about stress and negative life events. The therapist could then provide those in the patient's social circle with information about the contagion effect along with training that would provide examples of more adaptive ways of thinking (for an example of a program designed to train partners in adaptive cognitive feedback, see Dobkin et al., 2007). Surrounding a person with others who exhibit an adaptive cognitive style should help to facilitate cognitive change in therapy.

The immersion hypothesis has been tested in one study (Haeffel & Hames, 2014). In this study, changes in cognitive vulnerability levels were examined in a sample of randomly assigned freshman roommate pairs. It was hypothesized that moving to college would be similar to a second-language immersion experience. This is because the student is moving away from the environment in which his or her cognitive vulnerability developed and stabilized (i.e., the social context in which the first language was learned and supported) and immersing himself or herself into a new social context with people who speak differently about stress (i.e., L2). Results supported the immersion hypothesis. Participants who were randomly assigned to a roommate with low levels of cognitive vulnerability were likely to "learn" their roommate's cognitive style and develop lower levels of cognitive vulnerability. Moreover, those who experienced decreases in cognitive vulnerability had significantly lower levels of depressive symptoms over the prospective interval than those who did not.

Limitations

Whereas we argued that the perspectives offered by research on SLA have the potential to benefit CBT, we acknowledge that there are important differences between the two domains. For example, CBT involves a change in language behavior at the level of conceptualization (i.e., using the patient's existing language, but in a novel way), but SLA involves an entirely new system of communication (i.e., from speech sounds up through conceptualization). Some of the obstacles faced in SLA are therefore not present in CBT and vice versa. For example, in SLA, learning the new language typically means learning a new word for existing and familiar concepts (e.g., an English speaker learning the Spanish word for *tree*). However, in CBT, the person is using existing linguistic conventions to acquire new conceptualizations of the world (e.g., I am loved), including conceptualizations that contradict existing views of the world (e.g., one failure does not mean that I am a flawed human). Another difference between SLA and CBT is that processing in an L2 is often associated with a blunted emotional response (e.g., Costa et al., 2014), whereas the object of CBT is not to blunt emotional responses but rather to change them. Finally, immersion experiences will be different in SLA and CBT. Immersion in a second language works best when the immersion is as complete as possible; the learner spends the entire day using (and practicing) L2. Such total immersion would be difficult to accomplish in CBT, as it is unlikely that a person would be able to entirely avoid contact with contexts that relate to L1 (e.g., contact with friends or family members who reinforce patterns of cognitive vulnerability). Nonetheless, total immersion may not be necessary in order to improve outcomes from CBT. Here, we consider that the L2 of CBT would be relevant only at specific points during the day, and the learner's skill would consist, in part, of knowing when it is relevant to use L2.

It is important to note that further conceptual and empirical work is necessary to determine how best to apply the SLA hypothesis to CBT. For example, it may be necessary to create new therapeutic techniques to

implement the proposed changes to CBT. Although it may be effective to simply remove the component of CBT regarding identification of negative cognitions, this change may have downstream consequences. In traditional CBT, patients identify their negative cognitions, evaluate the evidence for and against the thoughts, and finally, generate a more adaptive cognitive response. This weighing of evidence may facilitate the generation of adaptive cognitions, and thus, additional scaffolding may be necessary for patients receiving a modified CBT. This might be accomplished, for instance, by having patients practice generating adaptive cognitions for hypothetical scenarios. Similarly, it may be possible to have patients list multiple adaptive cognitions and then weigh the evidence for and against these cognitions to determine which of them are most likely to be acceptable responses to future events. These different techniques, as well as the SLA/CBT hypothesis more generally, can be empirically tested using a component analysis approach to determine which techniques are most effective in reducing cognitive vulnerability and depression.

Conclusion

The primary purpose of this article was to put forth the novel idea that cognitive vulnerability should be conceptualized as a native language and to make recommendations for improving cognitive interventions on the basis of the SLA literature. The example used in this article also highlights the importance of evaluating how the skills and strategies used in clinical interventions were developed. Were the strategies derived from clinical experience and intuition or were they based on findings from basic psychological research? Most interventions have ignored research on the most effective ways to motivate, teach, and change cognitive and behavioral tendencies in humans (an exception would be exposure-based therapies for anxiety, which use work on basic learning principles and fear extinction).

Indeed, there are a number of other areas of cognitive psychology that could be used to improve CBT (as well as other clinical interventions). For example, Gordon Logan's (1988, 2002) work on automaticity and skill learning could be used to help people transition from a deliberately taught "correct" cognitive process to an automatic attention-driven memory process. Developing automaticity in generating adaptive cognitions is important because those at high risk for depression have lower levels of cognitive control and, thus, may not be able to use deliberate strategies when stressed (i.e., when they are most needed). Along these same lines, work on deliberate practice (Ericsson, 2008) could be applied to CBT. This highly effective form of practice is hypothesized to lead to, for example, world-class gymnasts and chess grandmasters. Deliberate practice could also be used to help cognitively vulnerable individuals become experts at generating more adaptive interpretations of stress. These are just a few examples from a large and nuanced cognitive psychology literature that could be applied to improving interventions for depression.

It may seem unlikely that small changes to an intervention (e.g., eliminating the activation of negative cognitions in CBT) could affect its efficacy. However, research shows that it is possible for ostensibly small changes to interventions to have profound effects on what participants gain from those interventions. For example, research on children's learning of mathematics shows that simply changing the format in which problems are presented during arithmetic practice can lead to large differences in children's understanding of foundational pre-algebra concepts (McNeil et al., 2011). Specifically, children who practice arithmetic problems written with operations on the right side of the equals sign (e.g., ____ = 9 + 8) construct a better understanding of mathematical equivalence than children who practice the same problems written in the traditional way with operations on the left side of the equals sign (e.g., 9 + 8 = ____), and these benefits last for at least 6 months (McNeil, Fyfe, & Dunwiddie, 2015). This example demonstrates that a small, targeted change to an existing intervention can increase its efficacy. Thus, it is feasible that simply changing how one identifies and evaluates negative thoughts in CBT could have clinically significant and lasting effects on patient outcomes.

In conclusion, one of the primary goals of cognitive therapy is to teach an individual with a depressogenic thinking style (i.e., a cognitive vulnerability) a new way of thinking about life stress. We compared this process with learning a second language. Like learning a new language, cognitive therapy requires patients to supplant a deeply engrained pattern of thinking with a new pattern of thinking (in the same domain). They must suppress their prepotent tendency to generate negative cognitions (L1) so that they can generate a more adaptive cognition (L2). The purpose of this article was to use an SLA framework to evaluate the strategies typically used in cognitive therapy and to propose improvements. The translation of basic research findings from cognitive psychology to clinical contexts can improve existing interventions as well as foster cross-area collaborations in psychology.

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Author Contributions

Both authors contributed to the conceptualization as well as the text of the manuscript. G. J. Haeffel drafted the original version of the manuscript, and M. P. Kaschak provided critical revisions. Both authors approved the final manuscript for submission.

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