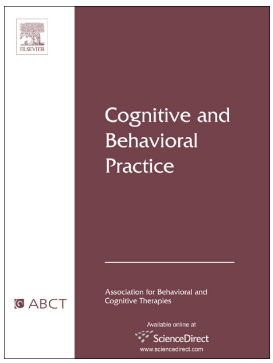

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Cognitive Enhancement Strategies to Augment Cognitive-Behavioral Therapy for Anxiety and Related Disorders: Rationale and Recommendations for Use With Cognitively Healthy Older Adults

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[Abstract]

Cognitive-behavioral therapy (CBT) is widely recognized as an efficacious treatment of anxiety and related disorders—however, recent research suggests that some older adults may derive reduced benefit from CBT as compared to younger adults. Age-related declines in cognition (e.g., memory, attention) may be a contributing factor to the reduced benefit seen in this population. Augmentation strategies for optimizing CBT are now under way (e.g., exercise, medication), and indicate that cognitive support and enhancement strategies can improve both cognitive skills and treatment outcome in anxious older clients. This review discusses the current literature on enhancement strategies that target CBT aptitude directly (e.g., memory aids for therapeutic material) and indirectly (e.g., use of standardized cognitive tasks unrelated to CBT) as methods of augmenting CBT. Recommendations for clinicians and directions for future research are provided.

Keywords: older adults; cognitive-behavioral therapy; CBT augmentation; cognitive enhancement strategies; treatment optimization

Cognitive-behavioral therapy (CBT) is widely recognized as one of the world's leading interventions across mental health problems and age groups (Gaudiano, 2008). Despite CBT's strong empirical roots and global rise in popularity, accumulating evidence has revealed special populations that may experience reduced benefits from the therapy (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012; Nathan & Gorman, 2007). A range of clinical groups may be at risk for poor therapeutic response, including (a) individuals who abuse substances (e.g., Aharonovich, Nunes, & Hasin, 2003); (b) bipolar individuals (e.g., Cuijpers, Smit, Bohlmeijer, Hollon, & Anderson, 2010); (c) patients with traumatic brain injury (e.g., Hsieh, Ponsford, Wong, & McKay, 2012); (d) individuals with learning disabilities (e.g., Hassiotis et al., 2012); and (e) anxious, depressed, or cognitively impaired older adults (e.g., Gould, Coulson, & Howard, 2012; Mohlman & Gorman, 2005; Scogin, Fairchild, Yon, Welsh, & Presnell, 2013).

Despite the many therapeutic advances made by CBT, a comprehensive review of meta-analyses across a range of disorders yielded response rates of 38–82%, which implicates a need for optimization (Hofmann et al., 2012). To address this problem, initial investigations of augmented versions of CBT are under way, with a diverse range of strategies being applied to enhance its potency, such as exercise, mindfulness, and cognitive rehabilitation. Some of these augmentations have a solid theoretical rationale for combining with CBT, while others take a more pragmatic approach. Some combined interventions exert simple additive effects in which two independent strategies lead to a better outcome when combined (e.g., Abdollahi et al., 2017; Gary, Dunbar, Higgins, Musselman, & Smith, 2010), whereas others argue for a potentiating effect in which the augmentation enhances or "liberates" the inherent potency of the original therapy (e.g., Wetherell et al., 2011). The current review focuses on one theoretically

potentiating strategy for optimizing CBT: the addition of a cognitive enhancement or rehabilitation component (e.g., memory aids, executive skills training).

Although there are multiple factors that determine therapeutic response, one plausible hypothesis for disparity in CBT outcome is the presence of malleable cognitive deficits (e.g., memory problems, perseveration, attentional impairment) in the context of psychological disorders or as attributes of certain patient subgroups. These deficits can interfere with the successful learning and implementation of CBT techniques in the short term or the successful maintenance of gains in the long term, which may inhibit a full therapeutic response in adults of all ages (Harvey et al., 2016; Mohlman & Gorman, 2005; Scogin et al., 2013).

Given that psychological disorders have the potential to exacerbate age-related cognitive decline (Behnken et al., 2010; Raz, Rodrigue, Williamson, & Acker, 2004; West, 1996), older clients may be an ideal population in which to test the efficacy of augmented CBT (Yochim, Mueller, & Segal, 2013). Furthermore, in a meta-analysis of CBT for generalized anxiety disorder (GAD) that compared adults of working age to older adults, Kishita and Laidlaw (2017) found that although there was no statistical difference in outcome between age groups, studies of late-life GAD yielded moderate effect sizes, whereas the studies of younger adults yielded large effect sizes. Thus, mental health treatment in later life could benefit from effective augmentation.

Research on cognitive enhancement has demonstrated this strategy's effectiveness in nondemented elderly, particularly among those with age-related baseline deficits in cognitive performance (Ballesteros, Kraft, Santana, & Tziraki, 2015; Lenze & Bowie, 2018). These deficits can occur due to normal processes of aging in the absence of neurological compromise due to disease, trauma, or neurotoxic events. Lifestyle factors (i.e., health status, education, occupational status, and activity level), as well as biological processes (i.e., neural atrophy,

decreased neurotransmitter and receptor concentration activity, and the presence of nonpathological senile plaques), contribute to late-life cognitive deficits in various domains of cognition (i.e., memory, attention, and executive functioning [EF]) and have the potential to impede treatment (Balasubramanian, Kawas, Peltz, Brookmeyer, & Corrada, 2012; Wirth, Haase, Villeneuve, Vogel, & Jagust, 2014).

The Current Review

Research on cognitive enhancement as an adjunct to CBT is nascent—thus, the goals of this paper are to (a) familiarize readers with the current status of cognitive enhancement strategies as an augmentation to CBT, (b) discuss the relevant literature specifically targeting geriatric anxiety and related disorders, (c) develop a set of preliminary best-practice guidelines, and (d) outline areas for future work in this specific area.

Methods of Augmenting CBT With Cognitive Enhancement

CBT augmented with cognitive enhancement can be completed through two avenues that can be conducted on their own or in conjunction with each other. The first method is to utilize specific cognitive strategies to enhance understanding and memory for and implementation of CBT techniques. For example, a therapist may utilize repetition to increase patient recall for important components of treatment. Specific memory support strategies have been used in targeting depression in younger (Dong, Lee, & Harvey, 2017; Harvey et al., 2016) and older adults (Scogin et al., 2013) and late-life GAD (Mohlman et al., 2003). See Table 1 for specific strategies that may be implemented to enhance treatment.

The second method is to apply cognitive enhancement more generally by aiming to improve cognitive skills themselves. Therapists can augment CBT with cognitive skills training as poor cognitive skills have been shown to impact CBT outcomes (Mohlman & Gorman, 2005). This nonspecific strategy has been tested in younger adults with unipolar depression (Siegle, Ghinassi, & Thase, 2007), bipolar disorder (BD; Deckersbach et al., 2010), and social anxiety disorder (SAD; McEvoy & Perini, 2009), and in older adults with GAD (Mohlman, 2008; Mohlman & Gorman, 2005), anxiety co-occurring with Parkinson's disease (PD; Mohlman, DeVito, Lauderdale, & Dobkin, 2017), and hoarding disorder (HD; Ayers, Wetherell, Golshan, & Saxena, 2011; Ayers et al., 2009).

Summary of Studies Directly Enhancing Memory for CBT Skills

Cognitive support strategies are direct techniques that have been shown to improve CBT treatment adherence and outcomes through the enhancement of episodic memory encoding and retention of the content covered in therapy sessions (Dong, Zhao, Ong, & Harvey, 2017; Harvey et al., 2014). Approximately 40–80% of patients have been shown to forget important information provided by a clinician (Harvey et al., 2014). Memory for content covered in psychotherapy sessions has been shown to be related to treatment outcomes—therefore, understanding of which memory strategies are most helpful and the utilization of cognitive support strategies throughout treatment is paramount (Harvey et al., 2016, 2017).

Bourgault-Fagnou and Hadjistavropoulos (2013) examined whether health anxiety severity as well as other secondary outcomes (e.g., motivation for therapy and therapeutic alliance) differed between standard CBT (SCBT), enhanced CBT (ECBT), and a wait-list control (WLC) condition in a group of 57 self-referred older adults with subclinical levels of health

anxiety (*M* age = 68.72, *SD* = 6.92). ECBT consisted of CBT augmented with memory aids, such as homework reminders, review of concepts, and summarization of techniques. Individuals in the SCBT (i.e., 66.7%) and ECBT (i.e., 55.6%) conditions demonstrated clinically significant change posttreatment and at 3-month follow-up compared to participants in the WLC condition, although there were no significant differences in outcomes between SCBT and ECBT.

Mohlman and colleagues (2003) examined the efficacy of ECBT in older adults with GAD. ECBT included learning and memory aids designed to (a) increase homework compliance, (b) strengthen memory for therapeutic techniques, and (c) facilitate the use of techniques. Augmentations included midweek homework reminder/troubleshooting with the therapist, inclusion of a perspective-taking strategy to facilitate evidence generation during cognitive restructuring, and expanding weekly review of the material covered during treatment. Individuals who received ECBT showed lower GAD severity ratings, improvement on two self-report measures, and lower rates of posttreatment GAD compared to those in the WLC condition. Effect sizes were slightly larger for ECBT than for CBT, although these two intervention conditions were not directly compared. Importantly, homework completion was higher in those in the treatment condition in ECBT compared to those in the treatment condition in CBT as usual. Noncompletion of homework has been cited as one of the largest barriers to CBT response with older adults (Kazantzis, Pachana, & Secker, 2003).

Harvey and colleagues (2014, 2016) propose eight strategies drawn from the cognitive psychology literature (i.e., Lee & Harvey, 2015) to enhance learning and memory for material discussed in the therapeutic process: attention recruitment, categorization, evaluation, application, repetition, practice remembering, cue-based reminders, and praise of recall (see Table 1 for summarization of cognitive support strategies discussed in Harvey et al., 2016).

In a sample of 48 depressed adults (*M* age = 43.92), Harvey and colleagues (2016) found that repetition and attention recruitment were the two most commonly used cognitive support strategies by therapists. Attention recruitment in this context refers to the reduction of divided attention and directing attention toward therapy-related information. This can be done in various ways (see Harvey et al., 2014, for more information), such as the therapist explicitly communicating to the patient that this is an important treatment point to remember (e.g., "This is the most important point to remember from today's session"), or can be done by introducing in a unique presentation mode that makes it more likely to capture a patient's attention (e.g., on a whiteboard/through imagery). Results also revealed that the use of cognitive support bundles (i.e., the use of more than one strategy at the same time) yielded better past session and cumulative recall, improvement on measures of global functioning (i.e., Global Assessment of Functioning; Jones, Thornicroft, Coffey, & Dunn, 1995), and less likelihood of relapse. However, no significant effects on measures of depression were found between cognitive therapy (CT) plus enhanced support and CT as usual, perhaps because younger and middle-age adults do not often show deficits in EF, thus the augmentation was not effective in potentiating the intervention. These specific methods have yet to be tested in older adults.

Scogin and colleagues (2013) examined the efficacy of a combined cognitive bibliotherapy and a self-administered memory-training protocol in a sample of 53 depressed older adults (*M* age = 68.4, *SD* = 6.6) that consisted of 24 one-hour study periods that addressed different memory exercises, such as chunking, imagery, mnemonics, and method-of-loci techniques. In contrast to previous studies by Scogin and colleagues (Scogin, Jamison, & Gochneaur, 1989; Scogin, Rickard, Keith, Wilson, & McElreath (1992), objective memory recall and rates of self-reported depression symptoms did not differ between the combined treatment

protocol and the CBT-as-usual condition. The lack of success of the combined intervention may be due to high attrition rates within the study (i.e., 50% at follow-up). During exit interviews, participants reported that the amount of time needed to devote to the combined protocol was excessive, and a reason for terminating treatment early. Therefore, shorter, more focused therapist-driven protocols that employ a variety of cognitive support strategies may be more appropriate in order to keep patients engaged in and benefit from treatment.

These preliminary findings suggest that older adults may benefit more from a structured, therapist-implemented protocol of cognitive support strategies that is relatively brief (e.g., Harvey et al., 2014, 2016; Mohlman et al., 2003) rather than longer self-administered memory-training protocols (Scogin et al., 2013). CBT augmented with therapist-driven cognitive support in younger adults has shown to enhance memory for treatment and may have the potential to lead to better treatment outcomes in older adults. However, as suggested by Harvey and colleagues (2014), the cognitive support strategies that are most useful in improving treatment outcomes may differ between younger and older adults—therefore, future research in this area is needed to examine these potential differences. For example, techniques such as attentional recruitment may be commonly used and effective for clinicians working with younger adults, whereas those working with older adults may benefit more by using strategies such as categorizing multiple therapy points based on common themes and principles (Kessels, 2003). To illustrate, a therapist may aid a patient in creating a cohesive list of methods to manage his or her worry. Ultimately, the cognitive support strategies used should be commensurate with the patient's cognitive profile and should allow for cognitive scaffolding in areas of weakness that will aid older adults in receiving maximum benefit from treatment.

EF as a Transdiagnostic Process and Predictor of CBT Outcome

EF refers to higher-order cognitive functions that have been shown to be involved in emotion regulation (e.g., Miller, Rodriguez, Kim, & McClure, 2014; Ochsner, Bunge, Gross, & Gabrielli, 2002; Sperduti et al., 2017) and when impaired, may serve as a transdiagnostic process for mental health problems (Harvey, Watkins, Mansell, & Shafran, 2004; Snyder, Miyake, & Hankin, 2015). An aspect of EF called cognitive flexibility involves one's ability to shift between rules and take other perspectives, understanding theory of mind. Generative thinking has especially been linked to types of repetitive negative thinking common in anxiety and depressive disorders, such as worry and rumination, respectively (Philippot & Agrigoroaei, 2017; Ehring & Watkins, 2008). Both cognitive flexibility and generative thinking (also termed "fluency" within the literature) have been shown to be impaired in anxious older adults when compared to nonanxious older adults (Johnco, Wuthrich, & Rapee, 2015). An understanding of the underlying cognitive mechanisms of anxiety and comorbid disorders in older adults have important implications for informing evidence-based treatment, such as CBT, in that it provides an additional treatment target to enhance these interventions.

An appreciation of the relationship between anxiety and cognition is also essential in developing a potentiating rather than additive approach to the augmentation of CBT via cognitive enhancement. Given the similarity of CBT exercises to established tasks of cognitive skills (e.g., similarity of evidence generation in cognitive restructuring to word generation on categorical word-naming tasks), it makes intuitive sense that there might be an association between specific CBT skills and performance on measures of EF. Some relevant hypotheses have recently been tested in older samples and suggest that this relationship may exist (see Johnco, Wuthrich, & Rapee, 2013; Mohlman, 2013, for further discussion).

Johnco and colleagues (2013, 2015; Johnco, Wuthrich, & Rapee, 2014) demonstrated in a series of investigations a relation of cognitive flexibility with aspects of cognitive restructuring (CR) acquisition, one of the core components of CBT. The relation of a composite index of cognitive flexibility to CR has been confirmed in both analogue and clinical samples of anxious older adults, and one investigation in this series also found an inverse relation of CR with general cognitive decline. Since each of these investigations was time limited, it is unclear in these early investigations whether a decrement in CR could be minimized with repeated practice on tasks of cognitive flexibility (Johnco et al., 2013). Additionally, the authors make clear that the majority of older adults can use CR successfully with relative ease despite the reduced success shown in those with a more rigid and perseverative cognitive style.

Mohlman (2013) has also argued that EF is likely to be involved in the successful implementation of CR in CBT. A standardized composite index of performance on tests of verbal EF (i.e., Controlled Oral Word Association Test; Benton & Hamsher, 1978; Verbal Paired Associates, Digit Span B; Wechsler, 1997) showed a positive association with the amount of evidence generated in CR, overall effectiveness of CR, and level of CBT homework compliance in a sample of 35 older patients with GAD (Mohlman, 2013). Furthermore, performance on a standardized composite index of nonverbal EF (i.e., Trailmaking Test Part B; Reitan, 1958; Matrix Logic, Digit Symbol; Wechsler, 1997) also showed a relation with CR effectiveness. A negative relation was found between scores of either verbal or nonverbal EF and premature termination of CBT—however, this was only among those with comorbid depressive symptoms.

A randomized control trial (RCT) of Internet-administered modular, transdiagnostic CBT for treating any late-life anxiety disorder (with comorbid depression allowed) in a sample of 66 older adults yielded a strong association of baseline cognitive flexibility as measured by the

Wisconsin Card Sorting Task-64 card version (WCST-64; Greve, 2001) and outcome (Silfvernagel et al., 2017). The relation was not found when a self-report measure of cognitive functioning was tested, indicating the importance of neuropsychological testing in assessing predictors of CBT outcome. The role of cognitive skills may prove to be particularly important in self-directed therapies, such as Internet CBT (ICBT), which relied upon the client's application of e-mailed material for interactive sessions, homework assignments, and the provision of feedback by the therapist.

Emerging research (Gallagher Thompson et al., 2015) using functional magnetic resonance imaging in late-life unipolar depression showed that activation patterns underlying the WCST (Heaton, Chelune, Talley, Kay, & Curtiss, 2003) predicted response to CBT as indicated by a diagnostic interview and score change on the Beck Depression Inventory (Beck & Steer, 1987). Brain regions that were differentially activated included bilateral inferior, middle, and superior frontal regions believed to be involved in sustained attention, self-monitoring, and inhibitory control. Tests of other components of CBT, such as self-guided exposure, problem solving, and thought stopping, have yet to be investigated relative to specific EF.

Summary of Studies Indirectly Enhancing CBT Skills by Targeting General EF Anxiety Disorder Studies

CBT for anxiety has sometimes been shown to be less efficacious in older adults when compared to younger populations (Mohlman, 2008). The current literature presents mixed findings regarding the role of pretreatment EF in the successful use of many CBT exercises (e.g., cognitive restructuring) and CBT outcomes. For example, Johnco and colleagues (2014) found that pretreatment EF skills were unrelated to the quality of cognitive restructuring at

posttreatment and posttreatment outcomes in a sample of 40 older adults. However, studies by Mohlman and Gorman (2005; Mohlman et al., 2017) found relationships between pretreatment EF and posttreatment outcomes. Mohlman and Gorman tested the hypothesis of pretreatment in a sample of 32 older adults with GAD (*M* age = 68.75, *SD* = 5.61) who had either weak or intact EF. The participants with weak and intact EF were randomly assigned to either CBT or WLC conditions.

Mohlman and Gorman (2005) found that individuals with weak EF did not respond well to CBT, and quality of homework was significantly lower when compared to the intact EF group that underwent the same intervention. Interestingly, treatment response on mood measures was best in a third subgroup that showed considerable post-CBT improvement in EF. Based on these findings, it appears that EF skills may be an important predictor of CBT outcomes. Further, this study demonstrates that EF skills may provide a potential target for intervention in those who demonstrate reduced benefit from CBT (Mohlman, 2008).

In a follow-up open-trial study, Mohlman (2008) tested the hypothesis that CBT augmented with an EF training program (Attention Process Training [APT]) would be associated with significantly greater improvement in EF than standard CBT in a small sample (*n* = 8) of older adults with GAD and EF that fell into the "low average" or lower range. Individuals who were characterized with "low average" EF typically had scores that were 1 standard deviation below age- and education-adjusted mean scores, which is indicative of mild, nonpathological executive dysfunction. Results demonstrated that those older adults who received the augmented CBT treatment experienced greater improvement in EF and better outcomes on measures of worry and anxiety than those who received CBT as usual, although the small sample precludes generalization of findings.

Similarly, in a sample of anxious older adults with PD and self-reported problems in EF (n = 10), Mohlman and colleagues (2017) examined the effects of the combined CBT and APT open-trial intervention on EF and anxiety. Anxiety is one of the most common psychiatric symptoms of PD, which negatively impacts social and occupational functioning in individuals with PD and is linked to physiological symptoms, including tremors, falls, unstable posture, and freezing of gait (Mohlman et al., 2017). Further, although cognitive impairment is highly prevalent in individuals with PD, those with comorbid PD and anxiety are at particular risk for poor EF and cognitive decline (Mohlman et al., 2017).

Although CBT is an efficacious treatment for the psychiatric symptoms associated with PD, it does not directly target cognitive deficits and EF, which may also interfere with the successful use of the treatment (Mohlman et al., 2017). Using the combined CBT/APT intervention, Mohlman and colleagues simultaneously targeted EF skills and treatment response to CBT in 10 anxious older adults with PD and self-reported problems in EF. Pre–post analyses revealed clinically meaningful improvement in mood for 50% of the sample, as well as clinically meaningful improvement in cognition in 40% of the sample. As a point of comparison, posttreatment response rates for CBT in older adults have been demonstrated to vary widely, ranging from 19.2% to upward of approximately 83.3% response (Hall, Kellet, Berrios, Bains, & Scott, 2016)—however, the aforementioned findings are typically consistent with or better than response rates demonstrated in larger RCTs for GAD (e.g., Stanley et al., 2009) and depression (Serfaty et al., 2009).

HD Studies

HD is a common condition related to anxiety disorders, with rates that are proposed to be three times higher in older populations compared to younger populations (Ayers & Dozier, 2015). HD is highly comorbid with anxiety and depressive disorders (Ayers et al., 2009). Standard CBT for late-life HD has shown minimal effectiveness (Ayers et al., 2009). Potential underlying neurocognitive impairment and EF deficits associated with HD populations are known to maintain HD symptoms and contribute to functional impairment (Ayers, Dozier, Wetherell, Twamley, & Schiehser, 2016). These deficits may limit responsiveness to standard CBT approaches (Ayers et al., 2011). For example, Ayers and colleagues (2016) examined the relationship between EF and daily functioning in a sample of 113 older adults and found that older adults with deficits in cognitive flexibility demonstrated increased difficulty maintaining organizational systems for their belongings.

Given these findings, Ayers, Saxena, Espejo, Twamley, Granholm& Wetherell, (2014) tested this hypothesis in a sample of 11 older adults with HD (*M* age = 66, *SD* = 7) in an open trial using a manualized intervention including behavioral therapy for discarding and acquiring possessions augmented with cognitive rehabilitation of EF skills. Results revealed that HD treatment response (approximately 38–41%) doubled relative to previous trials of using CBT for HD in geriatric patients (approximately 18–20%).

Conclusions and Future Research

Decreases in cognition common in aging have been shown to impede psychological treatment (Silfvernagel et al., 2017). A few preliminary studies have observed that deficits in memory and EF may contribute to lower psychosocial functioning, cognitive abilities, and treatment response in adults with anxiety and comorbid disorders (e.g., Johnco et al., 2013;

Mohlman, 2008). Therefore, cognitive enhancement and remediation strategies that target EF and enhance activity in areas of the brain involved in emotion regulation have the potential to facilitate improvements in symptomatology.

However, despite the strong theoretical rationale for augmenting CBT with cognitive enhancement, the current state of the literature presents mixed findings regarding the usefulness of cognitive enhancement and remediation interventions as adjuncts to CBT for a range of psychological disorders in older adults. The current state of the literature has given rise to intriguing questions regarding the potential efficacy of these combined interventions and rationale for augmenting CBT with cognitive enhancement. One of the first questions is whether researchers to date have examined appropriate treatment targets.

Although the link between EF deficits and late-life depression is fairly well understood (e.g., Alexopoulos, Kiosses, Klimstra, Kalayam, & Bruce, 2002; Mast, Yochim, McNeill, & Lichtenberg, 2004), our understanding of the relation of EF to anxiety is not yet as robust. Recent research suggests that the cognitive aspects of anxiety (i.e., worry), rather than depression and the somatic aspects of anxiety, may demonstrate stronger relationships with cognitive performance in certain domains, such as memory, and certain aspects of EF, such as inhibition and switching (Beaudreau & O'Hara, 2009; DeVito, Calamia, Roye, & Greening, 2017; Mella et al., 2018). However, other studies have found that depression may impact areas of cognition not affected by anxiety (Basso et al., 2007).

Furthermore, while it is intuitive to assume EF, memory, and overall cognitive functions are impaired in the context of anxiety in older adults, evidence is mixed. For example, Bierman, Comijs, Jonker, & Beekman, (2005) found improved cognitive performance in mild anxiety, but weak performance on tests of delayed recall and learning ability in more severe cases. In a large

Norwegian epidemiological study of nondemented, community-dwelling older adults, Biringer and colleagues (2005) found that anxiety bore no relation whatsoever to cognitive abilities when comorbid depressive symptoms were controlled. Additionally, whereas Beaudreau and O'Hara (2009) argue for decrements in various cognitive performance domains (e.g., attentional and inhibitory control) in the context of normal and pathological worry in later life, Price and Mohlman (2007) have found positive relations of worry severity and inhibitory control and verbal EF. Based on these discordant findings, it is necessary to further elucidate the relation of cognitive functioning, anxiety, and how disorder comorbidity affects these relationships to best understand how to target potential deficits and enhance treatment outcomes.

Future evaluations of the effectiveness of augmented CBT with cognitive enhancement should take the aforementioned points into consideration when evaluating outcomes. Given that EF is often not assessed in geriatric mental health clinics, it is currently unknown whether anxiety-related symptoms are caused by deficits in EF, EF deficits are caused by untreated anxiety, or both. Additionally, it is unclear whether EF skills improve posttreatment and whether improvements in EF at posttreatment are caused by the intervention or external factors. As highlighted by Mohlman (2008), an explanation for the significant improvements in EF in older adults with GAD is that anxiety causes or contributes to EF deficits, and that improvement in anxiety will lead to improvements in skills regardless of cognitive training. However, Johnco and colleagues (2015) propose a different argument that suggests that underlying EF deficits may contribute to anxious and depressive symptomatology and that these deficits are maintained even with treatment. Therefore, outstanding questions are (a) whether the EF/anxiety relationship is directional with regard to geriatric anxiety and related disorder, (b) whether interventions that target EF in anxious older adults will also reduce anxiety-related symptoms, and (c) whether

modifications to the current interventions for anxiety and related disorders will reduce anxiety and improve EF, simultaneously.

The various methods and content used in cognitive enhancement is another question that needs to be addressed in this area of research. It is not yet known whether CBT-specific or general cognitive aids are most effective. If nonspecific stimuli are used, however, it is recommended to bridge exercises of cognitive enhancement in the laboratory setting to real-world settings with naturally occurring stimuli (Wykes & Huddy, 2009). For example, one component of the APT package used by Mohlman (2008; Mohlman et al., 2017) involves visual search in which the client identifies a target among a field of distractors. This task was translated to (a) a supermarket search task in which clients are asked to go to a section of the supermarket and rapidly search for a specific brand-name product among many different options; and (b) a search in which pairs of socks were separated, scrambled, then paired with mates under time constraint (Mohlman et al., 2017).

In summary, augmenting CBT with direct and indirect cognitive support strategies for older adults may enhance treatment efficacy in this population. Importantly, the main findings of the research reviewed herein may apply to interventions other than CBT. A small number of studies have shown that the ability to switch between targets to accomplish a task predicted outcome in pharmacological and psychosocial treatment of depression in an older sample regardless of whether participants received problem-solving therapy, supportive therapy, paroxetine, or nortriptyline (Beaudreau, Rideaux, O'Hara, & Arean, 2015). Specifically, participants who demonstrated the ability to complete the Trailmaking B Test in 82 seconds or less also showed at least a 50% decrease on the Hamilton Scales for Depression at posttreatment in all four treated groups. In a separate study, Mackin and colleagues (2016) found evidence for

the predictive role of Stroop Color Word performance in outcome across the two psychosocial interventions mentioned above, and strength of the prediction was greater than type of therapy. However, to truly examine the potential efficacy of these interventions, further research is needed to better determine which methods, alone or combined, are most effective in enhancing memory for treatment and boosting compliance (e.g., the successful implementation of CBT techniques). Future studies should also include larger RCTs that examine the efficacy of ECBT compared to CBT as usual to provide a clearer picture of best-practice and treatment recommendations.

An important limitation of this research pertains to proper control groups for various augmented designs, as many of the reviewed studies did not implement controls or used minimal WLC groups. The ideal deconstruction would include larger RCTs that would include various conditions, such as CBT plus cognitive techniques, CBT plus sham cognitive techniques, CBT as usual, cognitive techniques alone, and no treatment groups. Once better established, decomposition studies need to be completed on augmented interventions to reveal the most effective modules. At that point, it may be possible to condense the intervention to its most therapeutically active elements. This would address some of the barriers to treatment cited by older participants (e.g., Scogin et al., 2013).

Guidelines for CBT Augmented With Cognitive Enhancement

Based on the current literature, we provide preliminary guidelines for using cognitive enhancement as an augmentation to CBT:

Guidelines for Patient Considerations

- Cognitive screening to rule out dementia is the first step in revealing cognitive abilities in CBT clients. This is particularly important when clients are older, given common age-related changes in cognition and brain function.
- Clinicians who do not typically administer neuropsychological batteries may choose to start with a brief cognitive screener such as the Montreal Cognitive Assessment (MoCA; Nasreddine et al., 2005), which is publicly available, can be easily administered in 5–10 minutes, and has been shown to be superior to other cognitive screeners (e.g., Pinto et al., 2018). A cut-off score of 23 is indicative of mild cognitive impairment, whereas a score of 18 is indicative of mild dementia. More information, including online training on how to administer the MoCA, can be found at https://www.mocatest.org/.
- Poor cognitive flexibility has been shown to be a common underlying factor in anxiety and comorbid disorders (McEvoy, Watson, Watkins, & Nathan, 2013) and has been linked to poorer treatment outcomes (Johnco et al., 2013; Mohlman, 2008). To determine whether CBT augmented with executive skills training may be appropriate, clinicians can administer EF measures that assess cognitive flexibility.
- Cognitive support strategies used in treatment should be commensurate with the patient's cognitive profile and should allow for cognitive scaffolding in areas of weakness that will aid older adults in receiving the most benefit from treatment. For example, if a patient demonstrates poor recall memory but good recognition memory, cue-based reminders rather than practicing to remember may be more beneficial.

Guidelines for Implementation of Cognitive Support Strategies

- Brief, focused, therapist-driven protocols appear to be more effective than longer self-administered bibliotherapy cognitive support in older adults (Harvey et al., 2014, 2016; Mohlman et al., 2003; Scogin et al., 2013).
- The clinician should consider presenting cognitive rehabilitation skills to participants in concrete, manualized workbook format to ensure easy access to readings, homework assignments, and at-home behavioral practice of these skills.
- The practice should start at an easy level and a comfortable pace, with the clinician aiming for the 80% success rate before increasing the difficulty of the training (Cella & Wykes, 2019).
- Massed practice should be implemented in the early stages, and spaced practice in the later stages of training (Fiszdon, Choi, Bell, Choi, & Silverstein, 2016).
- It is recommended to include bridging exercises using real-world stimuli. In other words, the cognitive training should be translated from the clinical setting to the client's daily life (Wykes & Huddy, 2009). For example, to increase sustained attention, therapists could have patients read a chapter in their CBT workbook in a busy/noisy place for homework (see Mohlman, 2008, for further examples).
- There is some evidence that the use of more cognitive support strategies during treatment leads to better global functioning outcomes (Dong, Lee, et al., 2017). Therefore, clinicians should utilize more than one strategy so that patients can receive the maximum benefit possible from treatment.

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The authors have no potential conflicts of interest to disclose.

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Table 1

Strategies	*Description of Strategy*
Attention Recruitment	Reduction of divided attention during encoding of therapy-related material and developing methods to direct attention towards important therapy concepts
Categorization	Categorize multiple therapy points based on

	common themes/principles
Evaluation	Facilitate deeper processing of thoughts, feelings, and behaviors such as weighing advantages and disadvantages of thoughts
Application	Tying abstract therapy concept to concrete experiences in a patient's life
Repetition	Restating, rephrasing, and summarization of important therapy concepts by therapist
Practice Remembering	Frequent practice and restatement/summarization of therapy concepts by the client
Cue-based Reminders	Implementation of specific cues that can serve as facilitate learning and memory of important therapy points (e.g., mnemonics)
Praising Recall	Praise by the therapist of client's successful recall of information covered during therapy

[Highlights]

- There is a need to augment cognitive-behavioral therapy (CBT) in older adult samples to optimize treatment outcomes.
- Cognitive support strategies may enhance cognitive skills and treatment outcome.
- Strategies can seek to improve memory and implementation of CBT skills per se, or they may target executive functions and prefrontal areas more generally.
- The use of multiple cognitive support strategies may lead to better treatment outcomes.
- Future research is needed to determine how to best augment CBT with these methods.