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Theory-Driven Intervention for Changing Personality: Expectancy Value Theory, Behavioral Activation, and Conscientiousness

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Abstract

Considerable evidence suggests that personality traits may be changeable, raising the possibility that personality traits most linked to health problems can be modified with intervention. A growing body of research suggests that problematic personality traits may be altered with behavioral intervention using a bottom-approach. That is, by targeting core behaviors that underlie personality traits with the goal of engendering new, healthier patterns of behavior that over time become automatized and manifest in changes in personality traits. Nevertheless, a bottom-up model for changing personality traits is somewhat diffuse and requires clearer integration of theory and relevant interventions to enable real clinical application. As such, this manuscript proposes a set of guiding principles for theory-driven modification of targeted personality traits using a bottom-up approach, focusing specifically on targeting the trait of conscientiousness using a relevant behavioral intervention, Behavioral Activation (BA), considered within the motivational framework of Expectancy Value Theory (EVT). We conclude with a real case example of the application of BA to alter behaviors counter to conscientiousness in a substance dependent patient, highlighting the EVT principles most relevant to the approach and the importance and viability of a theoretically-driven, bottom-up approach to changing personality traits.

Keywords

Conscientiousness; Expectancy Value Theory; Behavioral Activation; Bottom-Up Approach to Personality Change

Introduction

Dispositional theories largely characterize personality traits as stable patterns of cognition, affect, and behavior that are consistent across contexts, heritable, functionally unchanging, and causal (McCrae & Costa, 2008). However, considerable evidence suggests that personality traits may be dynamic and shift along developmental trajectories (e.g., Johnson, et al., 2007; Roberts et al., 2006; Jackson et al., 2010). Emerging research also indicates that

personality traits can be modified using intervention (e.g., Clark et al., 2003; DeFruyt et al., 2006; Jackson et al., in press; Krasner et al., 2009; Tang et al., 2009).

Arguably, the first time it became clear that psychotherapy could be used to change a personality trait was with the publication of Smith, Glass, and Miller's (1980) seminal review of the effectiveness of psychotherapy in general. Smith, Class and Miller (1980) reported that relatively short-term cognitive-behavioral interventions altered personality traits more than a standard deviation. Building on this initial work, more recent research has demonstrated the changeability of personality traits through direct intervention across a number of domains. As a key example, a 20-week cognitive behavior therapy intervention aimed to treat depression was associated with changes in a number of personality traits, most notably in extraversion and neuroticism (Clark et al., 2003). Another more recent study demonstrated that training medical students in mindfulness resulted in changes in the traits of conscientiousness, agreeableness, empathy, and emotional stability (Krasner et al., 2009). Similarly, a social skill training program for recovering substance abusers led to increases in agreeableness, conscientiousness, and emotional stability (Piedmont, 2001); a cognitive training intervention for older adults (focused on inductive reasoning skills, crossword and Sudoku puzzles) increased participants' levels of openness to experience compared to a control condition (Jackson et al., in press).

A related line of work has examined the combination of psychosocial intervention and medication. For example, DeFruyt and colleagues (2006) found that individuals treated with a combination of either tianeptine or fluoxetine and therapy showed greater extraversion, openness to experience, agreeableness, and conscientiousness following treatment. Similarly, a recent study on the effects of cognitive therapy and medication (SSRIs) on depression found that both were associated with changes in neuroticism and extraversion compared to a control group (Tang et al., 2009). Most importantly, changes in depression were shown to be the result of changes in neuroticism, and long-term relapse in depression was explained by changes in neuroticism, such that people who decreased the most on neuroticism were the least likely to experience a relapse.

Theoretical Framework to Change Personality

Although accumulating evidence suggests personality traits indeed can change, to date there have been few endeavors to target particular personality traits using a theoretically-driven approach. One view that may be particularly relevant to intervention efforts conceptualizes personality traits as relatively enduring, automatic patterns of thoughts, feelings, and behaviors that differentiate people from one another and which are elicited in trait evoking situations (e.g., see the sociogenomic model of personality; Roberts & Jackson, 2008; Roberts, 2009); that is, personality is conceptualized to reflect the often nonconscious, reflexive ways in which people respond to discriminative stimuli in their environment. For instance, extraverts seldom enter a room and say to themselves "now, I'm going to act extraverted!" They enter a room and nonconsciously start acting and interacting. Furthermore, in this view, personality exists not only at the trait level, which reflects the relatively enduring signature of traits, but also at the state level, which reflects moment-to-moment fluctuations in functioning (e.g., see Fleeson, 2001). Although evidence indicates

that states are partially a reflection of traits (Nezleck, 2007), state-level variation also suggests the possibility that variation in thoughts, feelings, and behaviors may occur for other reasons (than those relating to the trait) and can be shaped by environmental contingencies (Roberts, 2009). As such, contingencies may be used to shape states, which in turn may change traits in a bottom-up fashion (Roberts, 2006). That is, healthy patterns of behavior that take hold and persist become "automatic" in largely the same way as did previous unhealthy patterns, thereby leading to lasting change at the trait level (Roberts & Jackson, 2008; Roberts, 2009). Thus, the challenge for any intervention to changing personality traits is not only to overcome the nonconscious nature of personality traits, but to also inculcate a level of change that is so complete it is automatic at a state level and instantiated over time in an enduring way.

We believe that going forward, efforts to change personality would benefit from a systematic, theoretically driven approach that aims to affect changes in personality through targeted behavior changes (i.e., according to a bottom-up model of personality change; also see Chapman, Hampson, & Clarkin, *this issue* for a further discussion of this model). That is, rather than focusing on the personality trait as the clinical target of interest, as would be the intended focus in a "top-down" approach, we instead focus on altering processes that underlie the manifestation of the trait that are most "accessible to monitoring and change" (i.e., behavior; see Chapman et al., *this issue*). Thus, through repeated practice of new behaviors targeted through intervention, the goal is for these new behaviors to become automatic or implicit. The degree to which the intervention can result in new behaviors that are automatized will ultimately manifest in trait-level changes (see Chapman et al., *this issue*).

Towards this end, the goal of the current manuscript is to propose a set of guiding principles to change personality traits in the context of a bottom-up approach. In doing so, we stress the importance of placing the intervention within a guiding theoretical framework that considers the core characteristics of the personality trait, but that targets the intervention at the level of core behavioral manifestations of the personality trait (as opposed to a top-down approach that would focus more directly on change at the level of the personality trait itself). Thus, we propose a framework that is based upon the notion that personality can be changed by targeting behaviors that characterize specific personality traits. These targeted behavior changes, although initially effortful, over time may become more automatic; it is at the point that the behaviors become ingrained that the new behavior patterns ultimately manifest in trait-level changes (Chapman et al., *this issue*; Roberts, 2006).

To provide an example of how to apply these guiding principles to target the trait of conscientiousness, we illustrate the use of Behavioral Activation (BA; Dimidjian et al., 2011; Hopko, Lejuez, et al., 2003; Jacobson et al., 1996; Lejuez et al., 2001) to target closely relevant behaviors as a means to change conscientiousness over time. BA is considered within a closely relevant theoretical framework, Expectancy Value Theory (EVT; Eccles, 2009; Eccles et al., 1983), which integrates personal motives and personality to demonstrate how identity shapes values, goals, and subsequent behaviors. We conclude with a real case example to provide a clear picture of what the integration of EVT and BA may look like in practice by demonstrating the application of BA to alter behaviors counter

to “conscientiousness” in a substance dependent patient while highlighting the EVT principles most relevant to the approach. Although BA has not previously been considered within the framework of EVT nor applied to change conscientiousness specifically, it is our hope that this paper depicts a bottom-up approach for changing conscientiousness using behavioral intervention, and that this may stimulate efforts for using a theoretically-driven, bottom-up approach to changing personality traits.

Changing Conscientiousness

As the focus of this special series, conscientiousness, defined as the aspect of personality closely related to individual differences in the propensity to be disciplined, goal-oriented, selfcontrolled, responsible to others, hardworking, orderly, and rule following (John & Srivastava, 1999; Roberts et al., 2009), represents one personality trait that has consistently been linked to important health and functioning outcomes across the lifespan, including physical health status (Hampson et al., 2007), longevity (Kern & Friendman, 2008), substance use (Bogg & Roberts, 2004; Walton & Roberts, 2004; Goodwin & Friedman, 2006; Trull et al., 2004), academic achievement (Noftle & Robins, 2007), and occupational functioning (Dudley et al, 2006; Roberts et al., 2007; also see Roberts et al., this issue for a detailed overview of conscientiousness and its clinical correlates). As discussed in the previous papers in this series, efforts to change conscientiousness may hold great public health significance in enabling changes across key outcomes related to health, functioning, and quality of life. Although there have been some interventions that have changed conscientiousness, for example using a mindfulness-based approach (Krasner et al., 2009) and social skills training (Piedmont, 2001), existing efforts to systematically target conscientiousness a priori using a bottom-up behavioral approach have been limited. As indicated above, there is a clear need for theory-driven targeted behavioral interventions to engender meaningful changes in seemingly intractable personality traits, such as conscientiousness, through automized behaviors that reflect the trait of conscientiousness. It may only be through these changes that become so implicit that we see sustained changes in health and functioning outcomes linked to conscientiousness.

Theory-driven Intervention to Change Conscientiousness

This reality sets the stage for developing a theory-driven approach to targeting conscientiousness through behavior change. We begin by considering a theoretical framework to guide a bottom-up approach to changing conscientiousness specifically. We then move to selecting a behavioral intervention that is most appropriate given the core aspects of conscientiousness and the behaviors that may most closely reflect this trait. We conclude with a real case example of the application of BA to alter behaviors counter to “conscientiousness” in a substance dependent patient, highlighting the EVT principles most relevant to the approach.

Selecting a Theoretical Framework Closely Tied to Conscientiousness

As modern personality trait theories do not commonly discuss the process of change and development, or unpack the composition of a trait in such a way as to make it clear just how to change it, alternative formulations may be particularly useful. We believe it is critical to

identify a motivational framework separate from the trait domain to facilitate change in personality (see Roberts & Wood, 2006 for a discussion of the neo-socioanalytic model that argues for the separation of motivation and traits). As noted above, traits are automatic patterns, and are thus unlikely to spontaneously change on their own without some intervention. We believe a successful intervention would work through the motivational system by making people both aware of their proclivities and then motivated to change them.

Given that conscientious is strongly linked to goal setting, commitment to goals (Barrick, Mount, & Strauss, 1993), achievement, persistence, and valuing performance (Chamorro-Premuzic & Furnham, 2003; Denissen et al., 2007; Sansone et al., 1999), we also aimed to identify a theory that focused on context, individual motivation, and achievement to provide a theoretical foundation for changing conscientiousness specifically. Further, a theory focused on motivation and achievement would be most relevant to conscientiousness, particularly to the aspects of conscientiousness most closely associated with healthy behavior.

Expectancy-Value Theory: A Formulation of Personality Closely Linked to Conscientiousness

A key example of a developed theory that focuses on motives, values, and goals, and their context-specific nature is Eccles' Expectancy-Value Theory (EVT; Eccles, 2009; Eccles et al., 1983). This theory incorporates both a consideration of personal motives and personality disposition to demonstrate how identity shapes values, goals, and subsequent behaviors and decisions. Given EVT's unique relevance to numerous aspects of conscientiousness (e.g., persistence, rule following), it may serve as a closely tied framework for theory-driven efforts to change conscientiousness specifically by providing a value-based framework for identifying behaviors core to the trait of conscientiousness.

EVT argues that individuals' choice and persistence in different domains can be explained by both their beliefs about how well they will do and the extent to which they ascribe value to the activity (Eccles, 2009; Wigfield & Eccles, 1992). According to Eccles' theory, identity can be thought of as composed of three main components: 1) a *value* component that focuses on the salience, centrality, and valence attached to individual characteristics and collective groups of which one is a member; 2) a *content* component that focuses on individual beliefs regarding tasks, behaviors, and activities that are associated with enacting one's identity; and 3) an efficacy or *expectancy* component that focuses on one's specific beliefs related to one's ability to enact these behaviors. These three components are thought to interact to influence experiences and interpretation of those experiences over time, which shape each other and continue to foster identity formation and transformation (Eccles, 2009). According to EVT, individuals with high valuing of, and expectations for, success at a task would then show ambitious goal-setting, persistence, effort, and subsequent achievement (Eccles et al., 1993; Eccles et al., 1984, Fredricks & Eccles, 2002; Wigfield, 1994; Wigfield & Eccles, 2002). Thus, EVT may provide a framework for understanding how to select behaviors that the individual will likely be motivated to practice and persist in

over time. In turn, this increases the likelihood of inculcating a level of change that ultimately becomes automatic at the trait-level.

The theory highlights the malleability of personal identities over time and across situations even at the same point in time, driven by context-specific characteristics that affect the salience of different identities. In particular, the value placed on activities and behaviors are based on context and the salience of identity. Salience of identity may also differ based on individual social and psychological experiences throughout development, the interpretation of these experiences, as well as continued social interactions and influences (Eccles, 2009). Eccles' perspective views behavioral choices as ways in which individuals "validate" their identities, and that personal identity in a context determines behavioral choices (i.e. "motivated action"). Decisions of how to "spend time and energy" are based on expectations of and values placed on behavioral choices, and these behavioral choices may serve to provide further information and experiences to drive identity development (Eccles, 2009). In sum, Eccles' conceptualization of identity formation is that it is malleable over time and across contexts, and that behavioral choices driven by one's identity may serve to further its formation.

Although the "important psychological consequences" of identifying value-driven activities in expectancy value theory have been noted (e.g., Deci & Ryan, 1985), rarely has EVT been tied directly to specific aspects of personality, such as conscientiousness, or to targeted intervention efforts. Numerous researchers have suggested the need for "theoretical integration of the field" (e.g., Eccles & Wigfield, 2002), specifically pointing to the integration of personality theory and clinical intervention. EVT may offer particular relevance to target changes in conscientiousness given the emphasis on context, individual motives, and value-driven behavioral changes that may ultimately affect changes in identity[1].

EVT and Conscientiousness

Conscientiousness is considered to be a personality trait highly relevant to motivation (Colquitt & Simmering, 1998), values (Barrick et al., 1993), achievement (Roccas et al., 2002; Dollinger et al., 1996) and persistence (Sansone et al., 1999). Conscientious individuals identify a greater number of values that are 'important' as well as to succeed at them (Barrick et al., 1993), in line with the goal-directed nature and expectancy for success characteristic of conscientious individuals (Veage et al., 2011; Barrick et al., 1993). Conscientious individuals are more likely to report valuing achievement (Dollinger et al., 1996; Roccas et al., 2002) as well as achievement related to health-related values specifically (Ludke et al., 2009). Studies have pointed to high levels of intrinsic motivation found among conscientious individuals (Furnham, 1995), which is related to lower external pressures to hold values (Veage et al., 2011). Further, conscientiousness is also influenced by ability and perceptions of one's skill (Witt & Ferris, 2003), in line with the third component of EVT (e.g., perceived self-efficacy to enact behavior).

[1]Please also see Eccles et al., *this series* for further detail on EVT.

The links described above are important because they show that EVT and conscientiousness are thematically similar and often correlated. However, there are also important distinctions. That is, EVT pertains to conscious thoughts and motives that can be manipulated and changed in the short run. Meanwhile, conscientiousness comes from the trait domain and reflects automatic manifestations of thoughts, feelings, and behaviors. From our perspective, EVT provides a set of mechanisms that can be manipulated in order to help change the thoughts, feelings, and behaviors that make up conscientiousness, as well as a framework for identifying value-driven behaviors that may be most reflective of the trait of conscientiousness. We foresee using motivational constructs to change trait-related thoughts, feelings, and behaviors until they become automatic. The key question is how to utilize this framework to enact long-term and relatively permanent changes in a personality trait moving form one's value system to their actual actions on a daily basis using a behavioral intervention.

Behavioral Activation: A Bottom-Up Approach to Changing Conscientiousness

Selecting an intervention that would be most likely to affect conscientiousness, specificity of the intervention to the core of conscientiousness and the overarching theoretical framework are important considerations. Although no behavioral interventions to date have sought to specifically target conscientiousness, accumulating evidence suggests an intervention that provides detailed structure, a focus on values, guided action, goal-setting, immediate feedback on progress and challenges, clear accountability, and an opportunity for remediation might be especially useful for building conscientiousness. One closely relevant example of an intervention that centers on structure, accountability, and value- and goal-driven behavior is Behavioral Activation (BA; Dimidjian et al., 2011; Hopko, Lejuez, et al., 2003; Jacobson et al., 1996; Lejuez et al., 2001), which is a practical and structured treatment based on reinforcement theory (Ferster, 1973; Lewinsohn, 1974). In the most straightforward and brief version of BA (i.e., Lejuez et al., 2001; 2011), individuals initially monitor their daily behavior and rate activities on levels of importance and enjoyment. This is meant to illustrate specific times of day or behavior patterns that may be contributing to low mood. The focus of therapy then moves to the identification of values, consideration of daily activities consistent with those values, and a structured plan for engaging in those valued activities, which includes exercises such as creating a hierarchy of potential activities based on perceived difficulty and scheduling activities into specific periods of one's day. The primary goal of BA is to increase engagement in goal-directed activities that are considered important, enjoyable, and in accordance with individual values across numerous domains of one's life. BA was initially developed as a treatment for depression and has since accumulated sufficient evidence to be considered efficacious for treating depression (Sturmey, 2009; Ekers, Richards, & Gilbody, 2008; Cuijpers, Van Straten, & Warmerden, 2007; Mazzuchelli, Kane, & Rees, 2009). Recent evidence suggests that BA can be efficaciously provided as an individual or group approach and condensed into a briefer format (e.g., 5 sessions) as practical barriers necessitate (e.g., Magidson et al., 2011), which are both points that support its broad application across a range of clinical settings.

BA vs. Other Motivation-Based Approaches—BA under the EVT framework shares similarities with other motivation-based approaches, such as Miller's Motivational

Interviewing (MI; Miller & Rollinck, 1991; Miller & Rose, 2009) and Oyserman's Possible Selves' identity intervention (PSII, Oyserman, Terry & Bybee, 2002) in eliciting behavior change from the client; however, these approaches differ in important ways. For example, the motivation to change agent in MI is conceptualized as originating intrinsically by the client's exploration and resolution of ambivalence, whereas in BA, this motivation is driven first by the client's success in completing scheduled, valued activities and is later internalized as a sense of achievement, which further promotes a positive cycle of change. Further, the bulk of change in MI is believed to occur within the therapeutic context, through change talk. Contrasting this notion, in BA, a greater focus is placed on structuring clients' schedules to foster engagement in goal-directed activities in a way that will promote their success in changing behavior; therefore, change occurs through action. BA and the PSII correspond in their goals to make contextual shifts that result in a value-driven life. However, a defining feature of BA is that in the therapy, the client is oriented toward identifying different values in various life domains, such as relationships, wellness, career/education, among others, increasing the scope of change relative to the PSII, which was designed to promote youths' connection with their school by specifically targeting this area. An additional important difference between the two approaches is the time-orientation of the discussion of client values. In the PSII, the possible selves as discussed in terms of the future. In BA, these discussions may be present-focused, through identifying activities that clients are already completing and in which they find value, future-focused through identifying changes they want to see occur and scheduling additional, positive activities, or past-focused, through clients indicating which activities they could decrease that have resulted in negative consequences in the past. Although it is important to contrast BA with other approaches for our purposes here, it is not meant to suggest that these approaches are contradictory. In fact, several ongoing studies are attempting to combine these approaches to capitalize on their potential synergy.

Relevance of BA to Conscientiousness within the EVT Framework

Although BA has not yet been tested as an intervention to change personality traits, or conscientiousness specifically, there are important conceptual links given the strong focus on individual values, structure, and accountability. In BA, individuals monitor their daily activities and subsequently identify alternative activities to introduce in one's life that align activities with values. This process requires individuals to attend closely to existing schedules, plan their days, set goals, and persist in an effort to achieve behavior change. These components of BA— monitoring of behavior and progress, goal setting, planning, value alignment, and persistence— map onto the core of EVT and the trait domain of conscientiousness. By applying behavioral techniques to conscientiousness-related goal structures and working with individuals long enough to routinize the changes in thoughts, feelings, and behaviors relevant to conscientiousness, we believe BA satisfies the requirements of an intervention that could change behaviors otherwise considered to be the result of traits and instantiate them as the product of newly-formed traits. That is, as the behavioral changes targeted in BA that map on closely to the trait of conscientiousness are practiced and continued over time, we would expect that they ultimately reach a level of automaticity that is more reflective of trait-level changes.

Beyond the conceptual relevance, the link between BA and conscientiousness also is indicated by the application of BA beyond depression and to disorders that are in essence the antithesis of conscientiousness. Indeed, BA has demonstrated preliminary effectiveness in reducing alcohol use (Reynolds et al., 2011), smoking (MacPherson et al., 2010), and improving substance use treatment outcomes (Daughters et al., 2008; Magidson et al., 2011), as well as obesity-related treatment outcomes (Pagoto et al., 2008). Further, case studies have highlighted the application of BA in preventing suicidal behaviors in patients with borderline personality disorder (Hopko, Sanchez, et al., 2003) and improving HIV medication nonadherence among individuals with HIV and substance use disorders (Daughters et al., 2010).

Despite the potential connections among EVT, BA, and conscientiousness, rarely have these connections been made or utilized to inform practical applications and may serve as a particularly helpful example of how theory can drive intervention efforts as a means to change personality, and conscientiousness specifically in a bottom-up fashion. Highlighting the links between BA, EVT, and conscientiousness may not only enhance the practical implications of utilizing EVT to intervene to change this specific personality trait, but it may also inform our delivery of BA by more closely targeting changes in conscientiousness. It is the hope that these efforts ultimately increase our understanding of how a bottom-up behavioral intervention may affect changes at the level of personality traits, as well as how trait-level changes may be associated with sustained healthy behavior following BA.

BA Case Study

Although we know of no existing efforts to guide clinical interventions using the framework of EVT, we believe the execution of BA inherently involves attention to the very principles that underlie EVT. Specifically, the link between values and motivation for activity engagement as implied in EVT distinguishes BA from other behavior therapies that focus on increasing pleasant events without necessarily grounding this in values (Lewinsohn, 1974); rather, BA, with a core focus on linking one's personal values directly with their commitment to daily activities, maps on closely with this central focus on values in EVT.

To illustrate the application of such an intervention and what it would look like in a real-world setting, we can draw from a clinical example of BA used to change behavior typical of individuals low in conscientiousness—in this case specific to the treatment of a cocaine dependent patient. It is our hope that this case example will spur interest in EVT for guiding clinical intervention and the importance of specifically targeting and assessing personality traits such as conscientiousness with therapies closely tied to these traits for relevant clinical problems.

Case overview

Mr. M was a 45-year old African American male who was in outpatient substance abuse treatment for cocaine dependence. He was court-referred to treatment and demonstrated numerous symptoms of cocaine dependence: in the year prior to entering treatment, he spent significant time trying to obtain and use cocaine, and as such neglected other areas of his life (work, family, daily responsibilities). He would often skip work, not return home to feed his

child or see his wife, and often missed bills he had to pay and legal appointments. He also suffered numerous psychological and health consequences as a result of his use; however, he continued to use despite these consequences. He met full criteria for cocaine dependence in the past year prior to treatment. He did not meet any other psychiatric diagnoses upon entry. Although we did not utilize any formal assessment of personality traits, the clinical presentation clearly indicated the patient was living a life quite inconsistent with the defining features of conscientiousness, particularly accountability across numerous life areas.

BA Treatment

As part of his treatment plan for relapse prevention following treatment, BA was employed not as an intervention to target substance use directly per se, but rather to instill a more positive and regular pattern of behaviors to address some of the other symptoms of cocaine dependence, particularly the neglect of other areas of his life—in essence increasing behaviors that reflected the core aspects of the trait of conscientiousness. The treatment rationale, guided by the main principles of EVT, was that through an exploration of the Mr. M's values, goal setting within those values, and scheduling of valued activities unrelated to substance use that he believed he could succeed in, this would enhance his personal motivation and persistence related to living a sober life. If he was able to find a sense of achievement and effort in pursuing activities outside of substance use, this would enhance his ability to remain sober.

The specific treatment strategies employed in this case reflect core components of EVT (Eccles & Wigfield, 2002), including a consideration of "attainment value" (the importance of a given task), "intrinsic value" (the enjoyment one gains from doing a given task), the "utility value" (the degree to which a task fits into an individual's future plans), and "cost" (how much effort will be needed to accomplish the activity) in order to understand motivation related to activity engagement. First, Mr. M monitored his daily behavior including activities he was engaging in every day hour by hour, and rated these activities on subjective levels of "importance" and "enjoyment." This strategy was utilized to highlight the amount of time Mr. M had spent using cocaine, as well as other activities including those that might be further developed as good alternatives to cocaine use. Although Mr. M's substance use had lessened after entering treatment, he was still engaging in frequent cocaine use. Particularly on those days, the monitoring provided a clear illustration of how his substance use was clearly consuming most of his day, interfering with other important activities and his ability to be responsible to others in his life (e.g., picking up his daughter from school, going to work, and coming home to his wife). Importantly, these are core behaviors counter to the trait of conscientiousness. Regarding his cocaine use, he consistently rated it as "enjoyable" in the first few hours while high, and then the enjoyment rating lessened significantly over time; cocaine use was never rated highly on importance on any day. Interestingly, across the days of monitoring he also started to rate cocaine less enjoyable. His "important" activities included picking up his daughter at school, going to work, and paying bills, all which reflected accountability and responsibility, which he valued. His "enjoyable" activities besides substance use were playing games with his daughter, spending time with his wife, including cooking together, and watching TV. The

realizations provided with the monitoring exercise map on closely with the main principle of EVT. Specifically, spending significant time in activities that are ascribed little value or potential for mastery contributes to low mood and motivation for behavior change (Denissen et al., 2007; Wigfield & Eccles, 2002). This is precisely the focus of behavior monitoring in BA, to identify these patterns in which time is inadequately distributed to activities that are meaningless or bring little potential for reward.

Following three weeks of behavior monitoring, the therapy then turned to an identification of values, consideration of daily activities consistent with those values, and a structured plan for engaging in those valued activities, which included creating a hierarchy of potential activities based on perceived difficulty and scheduling activities into specific periods of Mr. M's day. Mr. M noted five core values that were most highly valued to him at this time, including being 1) a trustworthy father; 2) a dedicated employee (he worked full-time in landscaping before getting laid off due to missed work days); 3) a loyal and loving husband; 4) an accomplished citizen (to fulfill not only familial daily responsibilities but also things like paying bills, his taxes, and voting); and 5) living a sober life. In each case, these values reflect his underlying desire to behave in a more conscientious manner.

After identifying values, the treatment strategy involved identifying specific activities that he could do to live a life according to these values. With the therapist, he was guided in breaking down activities into small enough pieces that would promote success and diminish likelihood of failure. Further, he was asked to rate both the importance and enjoyment of these activities, as an attempt to differentiate between feelings of pleasure and mastery and incorporate activities that are likely to increase a balance of both (Lejuez et al., 2011). This is directly in line with the principles of EVT that the main factors that influence *value* ascribed to an activity that may predict actual engagement in that activity include both importance and enjoyment (i.e., the principles of "attainment," "intrinsic value," and "utility value" in EVT; Eccles & Wigfield, 2002). Next, across each of these values and value-based activities, Mr. M was asked to create a hierarchy in which he listed these activities in order of difficulty (i.e., similar to a hierarchy common in the treatment of anxiety disorders; Barlow & Craske, 2006) in order to guide the plan for increasing his engagement in this activities in a way that would be meaningful yet also manageable. This strategy of creating a hierarchy also maps onto the other core EVT principles, including assessing the "cost" of an activity (i.e., how much effort will be needed to accomplish the activity). At the bottom of his hierarchy, Mr. M listed activities that he was already occasionally doing that were in line with his values, such as picking up his daughter from school, cooking with his wife, and paying bills. At the top of his hierarchy were mostly activities related to his value of living a sober life, such as going to substance abuse treatment at least three times per week, not calling friends that were triggers for his use, giving his money to his wife after he got paid, and going to NA/AA meetings. He rated these as the most important activities to him, although some had little enjoyment and very high perceived difficulty.

Following the activity hierarchy, the treatment moved to actually scheduling the listed activities into Mr. M's days and monitoring his accomplishment of these scheduled activities over five weeks. This created a sense of accountability, a set plan, and a way to monitor progress, all which align with the core components of EVT to increase expectancy of self-

efficacy for truly valued activities. Mr. M was able to successfully accomplish many of the activities at the bottom of his hierarchy relatively quickly, and he found that on those days, he was more likely to be able to complete some substance use related activities. However, accomplishment of these activities took more time. By the end of treatment, he had significantly reduced his cocaine use (to one time per month) and reported living a much more fulfilling, enjoyable life, which included being employed again, managing his legal responsibilities, and continuing to develop a loving relationship with his wife and daughter. He did continue to note concerns regarding relapse, but that he was committed to maintaining his attendance at substance abuse treatment, NA/AA meetings, and activity scheduling even after the final BA session.

Case summary

The case example illustrates how BA may offer a set of empirically supported techniques that map directly onto the core components of an expectancy-value perspective of achievement motivation and its link to conscientiousness. Together, EVT and BA may provide a useful value-driven framework for pursuing behaviors that may be most reflective of conscientiousness that can be artfully subsumed through defining the patient's values and motivations according to this framework. Importantly, taking this approach allowed Mr. M to tackle the daunting task of addressing values with more concrete and achievable small steps that comprised his value-directed activities. In Mr. M's case, the target was purely bottom up aiming to change patterns of behaviors that would be more "conscientious," but the goal was sobriety and not necessarily personality change. However, this does not mean that personality change did not occur. BA may have led to personality trait change, as it does in association with other forms of psychotherapy (Smith, Glass, & Miller, 1980). Nonetheless, there is currently no empirical test of this conjecture. The next step in testing this approach as an intervention to change personality would be to examine to what extent the intervention can inculcate a level of behavior change that ultimately becomes automatic at the trait-level beyond any targeted psychopathology, which would in turn lead to changes in the relevant traits (i.e., conscientiousness).

Conclusions and Future Directions

Recent work suggests the dynamic, potentially changeable nature of personality (e.g., Johnson et al., 2007; Roberts et al., 2006; Jackson et al., 2010). This perspective has important public health implications, specifically raising the possibility that personality traits highly associated with health behaviors can be modified with intervention through targeted changes in behavior that become automatic over time. However, to date, there have been few efforts in this domain, and even fewer that target specific personality traits a priori and select an intervention within the context of relevant personality theory. Towards this end, the current manuscript aimed to present a bottom-up framework for behavioral intervention to produce consistent change in behavior and subsequent change personality that begins with consideration of a theoretical framework for behavioral change that is closely relevant to the core characteristics of the trait of interest. From this, one can identify a behavioral intervention in line with this theoretical framework to target behavioral changes closely relevant to the trait and emphasize routinized practice of these behaviors over time.

We provided a specific example to illustrate how a theoretically-driven framework may guide intervention efforts to change conscientiousness in a bottom-up fashion. In identifying a closely related theory, we focused on an alternate motivational theoretical framework, EVT, which highlights how identity shapes values, goals, and subsequent behaviors in a manner that may produce lasting change. Moreover, we utilized EVT as a theoretical framework to guide selection of an empirically supported intervention, BA; although BA has not yet been tested as an intervention to change personality, it has at its core the goal of building lasting behavioral change patterns in line with the overarching theory of EVT and the trait of conscientiousness.

Future directions from this work should examine the most appropriate dose (i.e., number of sessions) and format (i.e., group vs. individual) that are needed to slowly change the most intractable of personality traits. Specific to conscientiousness, future directions may include further explicit links between the principles of EVT and BA delivery, particularly the components of EVT that are most relevant to conscientiousness, as well as using EVT to drive the measurement of changes in conscientiousness following BA. Moreover, future research must test the extent to which intervention effects truly occur as a bottom-up process. This could be facilitated by using assessment measures during and after treatment to demonstrate that the intended behavioral changes occurred, and that these changes then led to longer-term, sustained personality changes. In addition to measures of the personality trait itself, this may also involve assessment of potential mediators which might include measures of motivation (Miller & Rose, 2009), activation or reward-based measures used to evaluate behavioral changes in BA (e.g., the Behavioral Activation for Depression Scale; Kanter et al., 2007 or the Reward Probability Index; Carvalho et al., 2011), or measures developed to assess EVT-related constructs (e.g., see Wigfield & Eccles, 2000 for example items to assess ability beliefs and subjective task values).

In summary, although we have focused specifically on EVT, conscientiousness, and BA, the overarching aim of the manuscript is less about the specificity of a particular trait, theory, or intervention, but rather the depiction of a theoretically-driven systematic approach for intervening to change personality using a carefully selected bottom-up approach. This approach may be applicable also to a range of personality traits, such as those previously tested in depression trials (neuroticism, extraversion; Tang et al., 2009). Lastly, although we utilize an existing empirically supported intervention with close relevance as our example, future work may consider developing a novel intervention, a priori, that is derived closely from personality theory. Whether adapting an existing intervention or formulating a new approach, an underlying theory should be used to guide the efforts going forward to change aspects of personality closely related to healthy behavior.

References

Barlow, DH.; Craske, MG. Mastery of your anxiety and panic: Client workbook. 4th ed. Oxford University Press; New York, NY: 2006.

Barrick MR, Mount MK, Strauss J. Conscientiousness and performance among sales representatives: Test of the mediating effects of goal setting. Journal of Applied Psychology. 1993; 78:715–722.

Bogg T, Roberts BW. Conscientiousness and health behaviors: A metaanalysis. Psychological Bulletin. 2004; 130:887–919. [PubMed: 15535742]

Carvalho JP, Gawrysiak MJ, Hellmuth JC, McNulty JK, Magidson JF, Lejuez CW, Hopko DR. The Reward Probability Index (RPI): Design and validation of a scale measuring access to environmental reward. Behavior Therapy. 2011; 42:249–262. [PubMed: 21496510]

Chamorro-Premuzic T, Furnham A. Personality predicts academic performance: evidence from two longitudinal studies on British University students. Journal of Research in Personality. 2003; 37:319–338.

Clark DM, Ehlers A, McManus F, Hackmann A, Fennell M, Campbell H, Louis B. Cognitive Therapy Versus Fluoxetine in Generalized Social Phobia: A Randomized Placebo-Controlled Trial. Journal of Consulting and Clinical Psychology. 2003; 71(6):1058–1067. [PubMed: 14622081]

Colquitt JA, Simmering MJ. Conscientiousness, goal orientation, and motivation to learn during the learning process: A longitudinal study. Journal Of Applied Psychology. 1998; 83(4):654–665.

Cuijpers P, van Straten A, Warmerdam L. Behavioral activation treatments of depression: A meta-analysis. Clinical Psychology Review. 2007; 27:318–326. [PubMed: 17184887]

Daughters SB, Braun AR, Sargeant MN, Reynolds EK, Hopko DR, Blanco C, Lejuez CW. Effectiveness of a brief behavioral treatment for inner-city illicit drug users with elevated depressive symptoms: The Life Enhancement Treatment for Substance Use. Journal of Clinical Psychiatry. 2008; 69:122–129. [PubMed: 18312046]

Daughters SB, Magidson JF, Schuster RM, Safren SA. ACT HEALTHY: A combined cognitive-behavioral depression and medication adherence treatment for HIV-infected substance users. Cognitive and Behavioral Practice. 2010; 17(3):309–321. [PubMed: 21709737]

Deci, EL.; Ryan, RM. Intrinsic motivation and self-determination in human behavior. Plenum; New York: 1985.

Denissen JA, Zarrett NR, Eccles JS. I like to do it, I'm able, and I know I am: Longitudinal couplings between domain-specific achievement, self-concept, and interest. Child Development. 2007; 78(2):430–447. [PubMed: 17381782]

Dimidjian S, Barrera M, Martell C, Muñoz RF, Lewinsohn PM. The origins and current status of behavioral activation treatments for depression. Annual Review Of Clinical Psychology. 2011; 7:1–38.

Dollinger SJ, Leong FTL, Ulicni SK. On traits and values: With special reference to openness to experience. Journal of Research in Personality. 1996; 30:23–41.

Dudley NM, Orvis KA, Lebiecki JE, Cortina JM. A meta-analytic investigation of conscientiousness in the prediction of job performance: Examining the intercorrelations and the incremental validity of narrow traits. Journal Of Applied Psychology. 2006; 91(1):40–57. [PubMed: 16435937]

Eccles J. Who am I and what am I going to do with my life? Personal and collective identities as motivators of action. Educational Psychologist. 2009; 44(2):78–89.

Eccles, J.; Midgley, C.; Adler, T. Grade-related Changes in the School Environment: Effects on Achievement Motivation. In: Nicholls, JG., editor. In *The Development of Achievement Motivation*. JAI; Greenwich, Conn.: 1984.

Eccles, JS.; Adler, TF.; Futterman, R.; Goff, SB.; Kaczala, CM.; Meece, JL.; Midgley, C. Expectancies, values, and academic behaviors. In: Spence, JT., editor. Achievement and achievement motivation. Freeman; San Francisco, CA: 1983. p. 75-146.

Eccles JS, Wigfield A. Motivational beliefs, values, and goals. Annual Review of Psychology. 2002; 53:109–132.

Ekers D, Richards D, Gilbody S. A meta-analysis of randomized trials of behavioural treatment of depression. Psychological Medicine: A Journal of Research in Psychiatry and the Allied Sciences. 2008; 38:611–623.

Ferster CB. A functional analysis of depression. American Psychologist. 1973; 28:857–870. [PubMed: 4753644]

Fleeson W. Toward a structure- and process-integrated view of personality: Traits as density distributions of states. Journal of Personality & Social Psychology. 2001; 80:1011–1027. [PubMed: 11414368]

Fredricks JA, Eccles JS. Children's competence and value beliefs from childhood to adolescence: Growth trajectories in two "male-typed" domains. Developmental Psychology. 2002; 38:519–533. [PubMed: 12090482]

Furnham, A. The relationship of personality and intelligence to cognitive thinking style and achievement. In: Saklofske, D.; Zeidner, M., editors. International handbook of personality and intelligence. Plenum; New York: 1995. p. 397-413.

Goodwin RD, Friedman HS. Health Status and the Five-factor Personality Traits in a Nationally Representative Sample. Journal Of Health Psychology. 2006; 11(5):643–654. [PubMed: 16908463]

Hampson SE, Goldberg LR, Vogt TM, Dubanoski JP. Mechanisms by which childhood personality traits influence adult health status: Educational attainment, healthy eating habits, and smoking. Health Psychology. 2007; 26:121–125. [PubMed: 17209705]

Hopko DR, Lejuez CW, Ruggiero KJ, Eifert GH. Contemporary behavioral activation treatments for depression: Procedures, principles and progress. Clinical Psychology Review. 2003; 23(5):699–717. [PubMed: 12971906]

Hopko DR, Sanchez L, Hopko SD, Dvir S, Lejuez CW. Behavioral activation and the prevention of suicidal behaviours in patients with borderline personality disorders. Journal Of Personality Disorders. 2003; 17(5):460–478. [PubMed: 14632378]

Jacobson N, Dobson K, Truax P, Addis M, Koerner K, Gollan J, et al. A component analysis of cognitive-behavioral treatment for depression. Journal of Consulting and Clinical Psychology. 1996; 64(2):295–304. [PubMed: 8871414]

Jackson JJ, Hill PL, Payne BR, Roberts BW, Stine-Morrow EAL. Can an old dog learn (and want to experience) new tricks? Cognitive training increases openness to experience in older adults. Psychology and Aging. in press.

Jackson JJ, Hill PL, Roberts BW. Interactionism in personality and social psychology: A whole that is less than the sum of its parts. European Journal of Personality. 2010; 24(5):495–497.

John, OP.; Srivastava, S. The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In: Pervin, LA.; John, OP., editors. Handbook of personality: Theory and research. 2nd ed. Guilford; New York: 1999. p. 102-138.

Kern ML, Friedman HS. Do conscientious individuals live longer? A quantitative review. Health Psychology. 2008; 27(5):505–512. [PubMed: 18823176]

Johnson W, Hicks BM, McGue M, Iacono WG. Most of the girls are alright, but some aren't: Personality trajectory groups from ages 14 to 24 and some associations with outcomes. Journal of Personality and Social Psychology. 2007; 93(2):266–284. [PubMed: 17645399]

Kanter JW, Mulick PS, Busch AM, Berlin KS, Martell CR. The Behavioral Activation for Depression Scale (BADS): Psychometric properties and factor structure. Journal of Psychopathology and Behavioral Assessment. 2007; 29:191–202.

Krasner MS, Epstein RM, Beckman H, Suchman AL, Chapman B, Mooney CJ, Quill TE. Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. Journal of the American Medical Association. 2009; 302:1284–1293. [PubMed: 19773563]

Lejuez CW, Hopko DR, Acierno R, Daughters SB, Pagoto SL. Ten year revision of the brief behavioral activation treatment for depression: Revised treatment manual. Behavior Modification. 2011; 35:111–161. [PubMed: 21324944]

Lejuez CW, Hopko D, Hopko S. A brief behavioral activation treatment for depression: Treatment manual. Behavior Modification. 2001; 25:255–286. [PubMed: 11317637]

Lewinsohn, PM. A behavioral approach to depression. In: Friedmann, RM.; Katz, MM., editors. The psychology of depression: Contemporary theory and research. Wiley; New York: 1974.

MacPherson L, Tull M, Matusiewicz AK, Rodman S, Strong DR, Kahler CW, Hopko D, Zvolensky MJ, Brown RA, Lejuez CW. Randomized controlled trial of behavioral activation smoking cessation treatment for smokers with elevated depressive symptoms. Journal of Consulting and Clinical Psychology. 2010; 78(1):55–61. [PubMed: 20099950]

Magidson JF, Gorka SM, MacPherson L, Hopko DR, Blanco C, Lejuez CW, Daughters SB. Examining the effect of the Life Enhancement Treatment for Substance Use (LETS ACT) on residential substance abuse treatment retention. Addictive Behaviors. 2011; 36(6):615–623. [PubMed: 21310539]

Martell, CR.; Dimidjian, S.; Herman-Dunn, R. Behavioral activation for depression: A clinician's guide. Guilford Press; New York, NY US: 2010.

Mazzucchelli T, Kane R, Rees C. Behavioral activation treatments for depression in adults: A metaanalysis and review. Clinical Psychology: Science and Practice. 2009; 16:383–411.

McCrae, RR.; Costa, PT, Jr.. The Five-Factor Theory of personality. In: John, OP.; Robins, RW.; Pervin, LA., editors. Handbook of personality: Theory and research. 3rd ed. Guilford; New York: 2008.

Miller, WA.; Rollnick, S. Motivational Interviewing: Preparing people to change addictive behavior. Guilford Press; New York: 1991.

Noftle EE, Robins RW. Personality predictors of academic outcomes: Big Five correlates of GPA and SAT scores. Journal of Personality and Social Psychology. 2007; 93:116–130. [PubMed: 17605593]

Oyserman D, Terry K, Bybee D. A possible selves intervention to enhance school involvement. Journal of Adolescence. 2002; 25:313–326. [PubMed: 12128042]

Pagoto S, Bodenlos JS, Schneider KL, Olendzki B, Spates C, Ma Y. Initial investigation of behavioral activation therapy for co-morbid major depressive disorder and obesity. Psychotherapy: Theory, Research, Practice, Training. 2008; 45(3):410–415.

Piedmont RL. Cracking the plaster cast: Big five personality change during intensive outpatient counseling. Journal of Research in Personality. 2001; 35:500–520.

Reynolds EK, MacPherson L, Tull MT, Baruch DE, Lejuez CW. Integration of the brief behavioral activation treatment for depression (BATD) into a college orientation program: Depression and alcohol outcomes. Journal of Counseling Psychology. 2011; 58(4):555–564. [PubMed: 21787070]

Roccas S, Sagiv L, Schwartz SH, Knafo A. The Big Five personality factors and personal values. Personality and Social Psychology Bulletin. 2002; 28:789–801.

Roberts BW. Back to the future: Personality and Assessment and personality development. Journal of Research in Personality. 2009; 43(2):137–145. [PubMed: 20161194]

Roberts BW, Jackson JJ. Sociogenomic personality psychology. Journal of Personality. 2008; 76(6): 1523–1544. [PubMed: 19012657]

Roberts BW, Kuncel N, Shiner R, N. Caspi A, Goldberg LR. The power of personality: The comparative validity of personality traits, socio-economic status, and cognitive ability for predicting important life outcomes. Perspectives in Psychological Science. 2007; 2:313–345.

Roberts BW, Walton KE, Viechtbauer W. Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. Psychological Bulletin. 2006; 132:3–27.

Sansone C, Wiebe DJ, Morgan C. Self-regulating interest: The moderating role of hardiness and conscientiousness. Journal of Personality. 1999; 67(4):701–733. [PubMed: 10444855]

Smith, ML.; Glass, GV.; Miller, TI. The benefits of psychotherapy. Johns Hopkins University Press; Baltimore, MD: 1980.

Sturmey P. Behavioral activation is an evidence-based treatment for depression. Behavior Modification. 2009; 33:818–829. [PubMed: 19933444]

Tang TZ, DeRubeis RJ, Hollon SD, Amsterdam J, Shelton R, Schalet B. Personality change during depression treatment: A placebo-controlled trial. Archives of General Psychiatry. 2009; 66:1322–1330. [PubMed: 19996037]

Trull TJ, Waudby CJ, Sher KJ. Alcohol, tobacco, and drug use disorders and personality disorder symptoms. Experimental and Clinical Psychopharmacology. 2004; 12:65–75. [PubMed: 14769101]

Veage S, Ciarrochi J, Heaven PL. Importance, pressure, and success: Dimensions of values and their links to personality. Personality and Individual Differences. 2011; 50(8):1180–1185.

Walton K, Roberts BW. On the relationship between substance use and personality traits: Abstainers are not maladjusted. Journal of Research in Personality. 2004; 38:515–535.

Wigfield A. Expectancy-value theory of achievement motivation: A developmental perspective. Educational Psychology Review. 1994; 6:49–78.

Wigfield A, Eccles J. The development of achievement task values: A theoretical analysis. Developmental Review. 1992; 12:265–310.

Wigfield, A.; Eccles, JS. Students' motivation during the middle school years. In: Aronson, J., editor. Improving Academic Achievement: Impact of Psychological Factors on Education. Academic Press; Amsterdam: 2002. p. 159-184.

Witt LA, Ferris GR. Social skill as moderator of the conscientiousness-performance relationship: Convergent results across four studies. Journal of Applied Psychology. 2003; 88(5):809–821. [PubMed: 14516246]