

A Longitudinal Examination of Regulatory Focus Theory's
Application to Adolescent Psychopathology

by

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Dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor of Philosophy in the
Department of Psychology and Neuroscience in the Graduate School
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ABSTRACT

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Abstract

Higgins' regulatory focus theory (1997) postulates two cognitive/motivational systems for pursuing desired end states: the promotion and prevention systems. The theory predicts that failure in each system is discriminantly associated with dysphoric and anxious affect respectively; and that significant failure in these systems creates vulnerability to depression and anxiety. This study tested these hypotheses among adolescents who took part in the longitudinal Wisconsin Study of Families and Work. We found partial support for the theory's predictions. Specifically, the original adult Selves Questionnaire (SQ), which was administered at age 13, did not demonstrate the expected discriminant associations with dysphoric and anxious affect and symptoms. However, the Selves Questionnaire – Adolescent Version, which was administered at age 15, yielded partial support for the theory. Ideal self-discrepancy was discriminantly associated with depressive affect but ought self-discrepancy was not discriminantly associated with anxious affect. However, feared self-discrepancy was discriminantly associated with anxious affect, which adds to the literature suggesting that feared self-discrepancy might be a better construct to use in measuring prevention failure among adolescents. The association between self-discrepancy and affect was found cross-sectionally but not longitudinally. The study also tested recently formulated predictions of regulatory focus theory which state that significant failure in one regulatory system is likely to negatively impact the other system (Klenk, Strauman, & Higgins, 2011). No

support for this prediction was found. Implications of the findings, and aspects of the study that may have reduced our ability to test the hypotheses of interest, are discussed.

Contents

Abstract.....	iv
List of Tables	viii
I. Specific Aims	1
II. Background and Significance.....	3
Regulatory focus theory.....	3
Regulatory focus theory and self-discrepancy.....	7
Regulatory focus theory and significant self-regulatory failure	9
The impact of significant failure within the promotion system.....	10
The impact of significant failure within the prevention system	13
Evidence supporting regulatory focus theory’s predictions regarding psychopathology	15
Regulatory focus and depressive/anxious comorbidity	17
Evidence.....	20
Summary.....	21
III. Research Design and Methods.....	23
Recruitment.....	23
Participants.....	24
Procedures.....	25
Measures	25
IV. Analysis	31
Preparatory Analyses	31

Analyses of study dropouts.....	31
Examination of the Selves Questionnaires (Original and Adolescent Version).....	33
Measuring Anxiety and Depression.....	35
Assessment of cross-sectional associations between self-discrepancy and affective experience associated with psychopathology	39
Assessment of the meditational role of promotion and prevention history	41
Assessment of longitudinal predictive associations between self-discrepancy and affective experience associated with psychopathology	43
Assessing the longitudinal predictive association between promotion and prevention failure	45
Regression Diagnostics.....	46
Controlling for Type I Error	46
Estimates of Statistical Power.....	46
V. Discussion	47
Appendix A. MacArthur Health and Behavior Questionnaires	56
Appendix B. Regulatory Focus Questionnaire	58
Appendix C. Age 13 (Grade 7): Selves Questionnaire	59
Appendix D. Selves Questionnaire – Adolescent Version	63
References.....	66
Biography.....	73

List of Tables

Table 1: Comparison of Sample.	32
Table 2: Factor Analysis.	37
Table 3: Statistics for Depressive and Anxious Experience	38

I. Specific Aims

Higgins' regulatory focus theory (1997) postulates two cognitive/motivational systems for pursuing desired end states: the promotion and prevention systems. The theory predicts that failure in each system is discriminantly associated with dysphoric and anxious affect respectively. It also predicts that significant failure in these systems creates vulnerability for depression and generalized anxiety. A number of studies have already demonstrated how failure in the promotion and prevention systems, as measured by self-discrepancy, is associated with symptoms of depression and anxiety, respectively. However, to our knowledge, these cross-sectional associations have yet to be examined among an adolescent population, despite the fact that adolescence is a developmental period during which rates of anxiety and depression are both prevalent and frequently comorbid (Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993; Seligman & Ollendick, 1998). The first aim of the current study is to validate previous cross-sectional findings in an adolescent sample. The second aim of this study is to test associations between promotion and prevention failure and depression and anxiety, respectively, using a longitudinal design.

Recent work has highlighted that regulatory focus theory has relevance for understanding the high degree of comorbidity between generalized anxiety disorder (GAD) and major depressive disorder (MDD) (Klenk, et al., 2011). Specifically, regulatory focus theory posits that the two motivational systems are mutually exclusive

and inhibitory, which suggests that failure in one system frequently leads to failure in the other system. If this is the case, then regulatory focus theory would not only help explain the high level of co-morbidity between depression and anxiety but help identify mechanisms by which one type of psychopathology creates vulnerability for the other. The third aim of this study is to test the proposal that links between prevention system and promotion system functioning are relevant to understanding depressive/anxious comorbidity. Specifically, the study will test whether dysfunction in one system is associated with dysfunction in the other system over time.

II. Background and Significance

Regulatory focus theory

Broadly speaking, self-regulation is a coordinated set of psychological processes guiding goal-directed behavior (Carver & Scheier, 1990; Karoly, 1999). Self-regulation occurs both consciously and unconsciously, involving goals at varying levels of abstraction. Similarly, self-regulation has both reflexive/mechanistic/automatic and intentional/agentic components (Bandura, 2001). While psychological theories of self-regulation acknowledge that human behavior reflects genomic, neural, and physiological influences, they also argue that a core aspect of human behavior is the effort to purposefully regulate behaviors, thoughts, and emotions to achieve desired goals, bring behavior in line with standards, control attention and thoughts, and manage affect (Posner & Rothbart, 2000). These capabilities are thought to have evolved to allow us to deal effectively with challenges that arise in our physical and social environments (Leary & Buttermore, 2003). However, these same capabilities also can render us vulnerable to a range of emotional disorders (Karoly, 1999).

Although there are a number of well-validated models of self-regulation, this study is testing predictions of one specific model known as regulatory focus theory (RFT; Higgins, 1997). RFT is a model of self-regulation that proposes two general motivational systems, referred to as the *promotion* and *prevention* systems. Self-regulation with a *promotion* focus involves advancement and accomplishment. The promotion system is sensitive to the difference between the status quo or neutral state and

a positive deviation from that state. Pursuing promotion goals means “making good things happen;” and this type of goal pursuit engenders an eager, approach-oriented, positive-outcome-focused, motivational state. From a signal detection theory standpoint, a promotion orientation involves focusing on maximizing “hits”, regardless of the number of misses or errors (Higgins, 1998). For this system, the perception of progress toward or attainment of a promotion goal results in happiness and joy, whereas feedback indicating no movement toward the goal results in sadness and disappointment.

Self-regulation with a *prevention* focus also occurs in the service of a desired end-state but it involves concerns with security, protection, and responsibility. The promotion system is sensitive to the difference between the status quo or neutral state and a negative deviation from that state. Pursuing prevention goals means “keeping bad things from happening;” and this type of goal pursuit engenders a vigilant, avoidance-oriented, negative-outcome-focused motivational state. Again using a signal detection theory standpoint, a prevention orientation involves focusing on avoiding errors rather than maximizing “hits”. Thus, stimuli indicating potential threats or dangers are the most salient, and perception of these cues and/or the failure to avoid the undesired outcome results in feelings of anxiety and dread. When an individual in a prevention state is successful in avoiding the undesired outcome, she or he typically experiences feelings of quiescence and calm or relief.

It is important to note that while both systems serve the purpose of pursuing positive end-states, each is associated with specific and distinguishing motivational

states, strategies for goal pursuit, and affective consequences of perceived success and failure. Support for the distinct nature of these systems can be found in recent studies indicating that promotion and prevention goals are associated with discriminable cortical activation patterns (Amodio, Shah, Sigelman, Brazy, & Harmon-Jones, 2004; Eddington, Dolcos, Cabeza, Krishnan, & Strauman, 2007).

With regard to the impact of “success” within each system, it is worth noting that the two systems differ in some important ways (Higgins, 1997). Within the promotion system, a stimulus indicating movement toward the desired goal is read as success feedback, while a stimulus indicating no movement toward the desired goal is read as failure feedback. Within the promotion system, the more progress an individual makes in moving toward a promotion goal, the more success they experience, and the more motivated that individual becomes to continue goal pursuit. In contrast, the nature of the prevention system dictates that a stimulus indicating that a satisfactory state has been maintained is read as success feedback, while a stimulus indicating increased likelihood of no longer maintaining a satisfactory state is read as failure feedback. Success in prevention goal pursuit often is experienced as an “all or nothing” enterprise; either one has avoided all the potential dangers or threats or one has not. Success in the prevention system generally serves to decrease motivation to continue goal pursuit as the success feedback often indicates that the danger has been successfully avoided and thus the goal accomplished. In both systems, perceived failure in goal pursuit results in negative affect

which can serve the adaptive purpose of motivating the individual to continue goal pursuit efforts, alter strategies, or disengage from one goal and initiate pursuit of another.

According to RFT, the two modes of self-regulation (i.e., promotion and prevention) are mutually inhibitory (Higgins, 1998). If one type of goal pursuit is engaged, the other is necessarily disengaged. Similarly, when one mode is blocked, interrupted, or unavailable (due to some dysfunction within that system), the other mode may come on-line as a compensatory mechanism. Since promotion and prevention systems operate in the service of goal pursuit, and goal availability and accessibility change continuously over time, under normal circumstances people with healthy regulatory systems will, at least to some extent, switch systems on a regular basis (Shah, Higgins, & Friedman, 1998). This mutual inhibition, combined with an ability to disengage from specific goals when attainment is unlikely, creates both flexibility and efficiency in goal pursuit (Shah & Higgins, 1987). Which mode of self-regulation an individual is engaged in at any particular time is influenced both by features of particular situations and by individual differences in chronic regulatory orientation (Higgins, 1997).

While all healthy individuals are thought to be capable of both types of goal pursuit, and will switch between systems at least some of the time, the relative chronic strength of orientation toward promotion vs. prevention (and sensitivity to relevant cues) is an individual difference that tends to be stable over time (Strauman, 1996). As predicted by the model itself, a primary developmental determinant of regulatory orientation is socialization (Higgins, 1989). In a prospective longitudinal study, Manian,

Papadakis, Strauman, & Essex (2006) found that differences in characteristic maternal parenting behaviors at age 3 predicted the strength of promotion vs. prevention orientation when children were in first grade. Interestingly, Manian et al. observed that children's approach and avoidance temperaments did not predict individual differences in prevention and promotion orientation, providing evidence that chronic regulatory focus is not biologically based but rather represents a developmentally distinct, socially-mediated mechanism for self-regulation of goal pursuit.

Regulatory focus theory and self-discrepancy

Self-discrepancy theory (SDT; Higgins, Bond, Klein, & Strauman, 1986) is a model of self-regulation focused on the affective consequences of different relations between self-representations of one's behavior and attributes, and important personal standards. The theory distinguishes among three major self-states: the *actual* self (an individual's beliefs about the attributes she or he currently possesses), as well as two kinds of internalized standards or *self-guides*. The *ideal* self represents the kind of person the individual wishes or hopes to be – one's goals for accomplishment or attainment (promotion goals). The *ought* self represents the kind of person the individual believes they should or ought to be – one's representation of one's obligations or responsibilities (prevention goals).

According to SDT, people assess their achievement and progress toward important personal goals by comparing their actual self with their ideal and ought selves. In the language of RFT, an actual:ideal (AI) discrepancy (also referred to as an ideal self-

discrepancy) represents a non-achievement of a promotion goal (in this case, an ideal self-guide). Consistent with self-regulatory theory, this failure to attain or make progress toward a promotion goal induces emotions such as sadness and disappointment. In contrast, an actual:ideal congruency represents attainment of a promotion goal (again, an ideal self-guide) and results in emotions such as happiness and joy. Similarly, an actual:ought (AO) discrepancy (also known as an ought self-discrepancy) represents a non-achievement of a prevention goal (in this case, an ought self-guide) that results in emotions such as fear, anxiety, and worry; while an actual:ought congruency represents attainment of a prevention goal (again, an ought self-guide) and results in emotions such as calmness and relief. In this way, self-discrepancy theory, particularly its emphasis on the critical distinction between ideal and ought guides, provided a way to operationalize and test regulatory focus theory's predictions regarding affective consequences of self-regulatory failure in an idiographically measurable and statistically reliable way.

A number of experimental studies have observed that idiographic goal priming (i.e., incidentally exposing an individual to a stimulus that is relevant to a particular self-guide discrepancy) has the predicted effects on affective states. In particular, priming of a self-guide that is discrepant with the actual self reliably induces the predicted affect: *dysphoric* affect if it is a promotion goal and *anxious* affect if it is a prevention goal (e.g., Higgins, et al., 1986; Strauman, 1989; Strauman & Higgins, 1987). Notably, the stimuli themselves in these priming studies always consist of positively valenced trait attributes which represented desired end-states (such as “intelligent,” “successful,” and

“attractive”) and which were assessed weeks or months prior to the experimental session. Thus, it is the self-regulatory significance of the priming cues – specifically, the relation between the self-guide and the actual self – that determines the impact of priming on affect and motivation, rather than the literal meaning of the priming cues, because positive priming cues induced negative states when they were involved in discrepancy relations for particular individuals.

Regulatory focus theory and significant self-regulatory failure

Regulatory focus theory goes beyond predicting specific types of affective experience in relationship to success and failures in goal pursuit. It also makes predictions regarding the role of self-regulatory failure in creating vulnerability to psychopathology, most notably for major depression and generalized anxiety disorder. In order to understand these predictions, it is crucial to distinguish between typical self-regulatory failure and more serious self-regulatory failure because RFT postulates that the two scenarios have very different consequences (Karoly, 1999; Strauman, McCrudden, & Jones, 2010). Intermittent, routine failure in personal goal pursuit is presumed to be a common and inevitable experience, and the negative affective state which results is likely to serve the adaptive purpose of helping the individual adapt her/his goal pursuit in more effective ways. Chronic self-regulatory failure, on the other hand, increases vulnerability to pathogenic changes in the overall functioning of the two regulatory systems which, in turn, increases risk for psychopathology (Higgins, 1989; Papdakis, Prince, Jones, & Strauman, 2006). Although less highlighted in regulatory

focus theory literature, it is worth noting that a traumatic failure is likely to have the same deleterious effects on the self-regulatory systems as does chronic failure. For instance, a violent attack on an individual represents a failure of an implicit but fundamental prevention goal related to keeping the self safe from harm (Brewin & Vallance, 1997). Similarly, the sudden and unexpected loss of a job or spouse can result in perceived failures in fundamental promotion goals because of the roles that relationships and careers play in enabling people to make good things happen (e.g. provide for their family, achieve intimacy and connection). Since both chronic and traumatic failure have the potential to dysregulate the systems, it is more accurate to refer to clinically important dysregulation of the promotion and prevention systems as resulting from “significant” failure experiences.

The impact of significant failure within the promotion system

Significant failure within the promotion system produces down-regulation of the system (Higgins, 2006). The repeated (or profound) pairing of promotion activities with the negative affect produced by goal pursuit failure reduces the strength with which this system engages. As a result of this weakened engagement, individuals are less likely to evaluate promotion goals as attainable (i.e., reduced optimism) and therefore less likely to pursue them (Miller & Markman, 2007). They may also be less likely to perceive opportunities to pursue promotion goals. As a result, these individuals have reduced opportunities to experience the positive motivational and affective consequences associated with making progress toward a promotion goal, and are much more likely to

experience the negative consequences of failing to advance their promotion goals (Förster, Grant, Idson, & Higgins, 2001). If the weakened engagement in the promotion system is not interrupted in some way, it can become a self-perpetuating cycle that ends in dysphoric affect, decreased incentive motivation, and negative self-evaluation – symptoms of depression that are indicative of a down-regulated state caused by a chronic inability to “make good things happen” (Strauman, 1992). Positively valenced objects and activities related to promotion goals become less attractive, contributing to the characteristic depressive symptom of “having no interest in doing things” (Higgins, 2006). One can understand this aspect of the self-regulation as potentially adaptive in situations in which continued investments of energy are not likely to yield anything for the individual while at the same time depleting her/him of resources (Nesse & Ellsworth, 2009). Along similar lines, it is worth noting that the reduced optimism aspect of this process has much in common with the hopelessness model of depression (Abramson, Metalsky, & Alloy, 1989). The way in which the promotion system becomes less responsive to cues for goal pursuit is also compatible with the classic perspective of Akiskal and McKinney (1973) that described depression as a “reversible functional derangement of the mechanisms of reinforcement” (p.22).

Consistent with this view, there is increasing evidence that depression both results from, and maintains, disruption of the psychological and biological mechanisms of incentive motivation (Dickson & MacLeod, 2004; Sutton & Davidson, 1997; Tomarken & Keener, 1998; Watson, Wiese, Vaidya, & Tellegen, 1999) and that dysfunction in

motivational systems of goal pursuit is associated with depression (Karoly, 1999; Kasch, Rottenberg, Arnow, & Gotlib, 2002). In addition, Eddington and colleagues (2009) recently provided fMRI evidence that individuals with depression show reduced activation in an area of the left orbitofrontal cortex previously associated with priming of promotion goals (Eddington, et al., 2007). Thus, there is evidence which supports the prediction of RFT that significant failure to attain promotion goals can lead to a weakening of the promotion system, and that at least for a subset of individuals this weakened engagement in the promotion system is fundamental to the phenomenology of depression.

An interesting aspect of regulatory focus theory's model of depression is that it is very compatible with current approaches to depression treatment. For example, behavioral activation strategies (Jacobson, Martell, & Dimidjian, 2001) involve getting people to become more active and engaged, with the expectation that in order to become more motivated and successful a person must do things. Although behavioral activation techniques were developed with a conceptual emphasis on the behavioral activation system rather than on cognitive-motivational processes, one could nevertheless interpret these strategies as effectively reversing the dysfunction of the promotion system by providing the individual with pairings between promotion goal pursuit and the positive affective consequences associated with promotion goal success. This success, in turn, would increase the engagement of the promotion system. As another example, cognitive change strategies involve getting people to evaluate and test their beliefs about

themselves and the world, including beliefs about the probability of success regarding promotion goals (e.g., Hollon, Thase, & Markowitz, 2002). A treatment for depression based in regulatory focus theory, Self-System Therapy (SST; Strauman et al., 2006), has also been developed. It was found to be as effective as standard cognitive therapy in treating depression. In addition, it was found to be more efficacious than cognitive therapy for a subset of depressed individuals whose socialization history lacked an emphasis on promotion goal pursuit (Strauman, et al., 2006).

The impact of significant failure within the prevention system

In contrast to the impact of significant failure on promotion system function (down-regulation and weakened engagement), significant failure of prevention system failure leads to increased engagement of the system (Higgins, 2006). Significant prevention failure means that an individual perceives her or himself as failing to “keep bad things from happening.” Under such circumstances, the individual is likely to believe that he/she is at continued risk or in danger from “bad things” and that current strategies are not sufficient to protect against this danger. This results in an increased effort to be vigilant and avoid harm, i.e., an increased engagement of the prevention system. As a result of this up-regulation, the emotional consequences to prevention goal pursuit are likely to be heightened and complex or ambiguous environmental stimuli are more readily interpreted as situations in which danger must be avoided rather than as opportunities to achieve success. In addition to intensifying and generalizing reactions from stimuli related to prevention goals to more broad categories of threat, a mechanism

consistent with cognitive models of hypervigilance (e.g., Leahy & Holland, 2000), increased engagement of the prevention system is also thought to lead to increased prevention failure through the adoption of more global and non-specific prevention goals and through prevention pursuit of goals that are more suited to promotion pursuit (Klenk, et al., 2011).

The idea that hyperactivation of the prevention system leads to increases in failure is consistent with the well-known curvilinear association between anxiety/arousal and task performance – the Yerkes-Dodson law (Yerkes & Dodson, 1908). This motivational principle states that there is an optimal level of arousal for maximum performance (including performance of complex, multi-step tasks such as goal pursuit). At both extremes of low and high levels of arousal, performance is poor. The Yerkes-Dodson law has been validated in a variety of areas including job stress (Bhuiyan, Menguc, & Borsboom, 2005), and academic achievement (Bodas & H., 2005; Keeley, Zayac, & Correia, 2008; Sarid, Anson, Tyaari, & Margalith, 2004). It has also been implicated in the etiology of anxiety disorders (Shankman and Klein, 2003). Notably, in their prospective study of the development of individual differences in regulatory focus, Manian et al. (2006) observed the same curvilinear association between maternal parenting behaviors postulated to convey prevention-focused messages, and individual differences in prevention orientation among children three years later. This finding suggests that even on the level of teaching and modeling prevention, there may be degrees of emphasis on “keeping bad things from happening” that are simply too intense

and that have the paradoxical effect of reducing ability to effectively pursue prevention goals.

The hyperactivation of the prevention system is not only thought to create increased levels of anxiety, but seems likely to create a more specific vulnerability to generalized anxiety disorder. For example, a number of the features hypothesized to indicate a chronically hyperactive prevention system are consistent with GAD symptoms. Increasing amounts of vigilance regarding potential threats is likely to result in symptoms of worry, feeling keyed up, and muscle tension. Similarly, the fatigue associated with GAD would be an expected secondary effect of the effort involved in being in a continuous heightened prevention state where one is constantly on guard. Furthermore, it is plausible that the GAD symptom of having difficulty concentrating results from the challenge of pulling focus away from a scanning of the environment for prevention cues; i.e., constantly checking for potential threats. Although the predictions of the RFT model regarding chronic failure and GAD are logically consistent and have some support from self-discrepancy research, it should be noted that there is not as much evidence available to support those predictions as is available to support the link between promotion system hypoactivation and depression.

Evidence supporting regulatory focus theory's predictions regarding psychopathology

While many of the mechanisms by which significant regulatory failure leads to psychopathology have yet to be empirically tested, there is evidence for the overall

association between regulatory failure and symptoms of psychological disorder. Studies have found positive correlations between the presence of depression symptoms and level of ideal self-discrepancy (promotion failure) and between the presence of anxiety symptoms and level of ought self-discrepancy (prevention failure) (e.g., Strauman, 1992; Strauman & Higgins, 1988). However, it should be noted that some studies have not found the predicted effects; finding no support (Tangney, Niedenthal, Covert, & Barlow, 1999); finding only some of the predicted discriminant effects; or finding general but not discriminant effects (Bruch, Rivet, & Laurenti, 2000; Phillips & Silvia, 2005, 2010).

Higgins (1999) has argued that this variability is likely due to conceptual and methodological issues, including differences among studies in the assessment of self-discrepancy, overlap between measures, statistical power, accessibility, and issues of comorbidity. In addition, some researchers have proposed that the construct of a feared self is more closely related to the functioning of the prevention system (Carver, Lawrence, & Scheier, 1999). One of the most important current problems in testing the predictions of the theory regarding symptoms of psychopathology, is that current methods of measuring self-discrepancy do not distinguish between significant failure, and typical failure or the natural gaps between goals and achievement that occur as older goals are met or discarded and new ones are developed. Some believe that it is likely that findings will become more consistent as measures are developed to be better able to distinguish between the two (Boldero, Moretti, Bell, & Francis, 2005).

Another major problem with literature addressing the association between regulatory focus theory and psychopathology is that the predictions of the theory have yet to be tested using a longitudinal approach. As mentioned above, one of the aims of the current study is to fill this gap.

Regulatory focus and depressive/anxious comorbidity

As described earlier, according to regulatory focus theory, activation of the promotion system and prevention system constitute mutually exclusive ways of pursuing goals at any given point in time. Since significant failure within either system can lead to dysfunction of that system, and since the systems function in a reciprocally inhibiting manner, RFT has natural extensions to the question of comorbidity between anxiety (especially GAD) and depression.

As discussed above, for at least a subset of individuals, depression is associated with hypoactivation of the promotion system. When the promotion system is impaired in this way, prevention becomes the default option for goal pursuit. The less active (and effective) the promotion system and the longer its attenuated/ineffective state lasts, the more active the prevention system is likely to become. Consistent with this, a recent neuroimaging study observed that depressed individuals not only showed an overall pattern of decreased promotion activation compared to non-depressed controls, but they also showed increased prevention activation compared to controls (Eddington, et al., 2009). As the prevention system becomes more and more the individual's dominant mode of self-regulation due to weakening engagement within the promotion system, the

individual becomes increasingly reliant on prevention if they want to actively pursue goals. However, if they engage in goal pursuit primarily through prevention, they become increasingly at risk for significant prevention failure through the same mechanisms that were described above. Thus, RFT suggests a self-regulatory “pathway” through which an underactive promotion system associated with depression can lead to a hyperactive prevention system and the associated psychopathology of generalized anxiety. This logic (a breakdown of reciprocal inhibition and normal effective function between approach-oriented and avoidance-oriented motivational systems) relates to the highly influential work of Mineka, Watson, and Clark (1998) on the behavioral activation and inhibition systems (BAS and BIS) in emotional disorders, but it should be emphasized that the promotion/prevention systems and BAS/BIS are conceptually, functionally and anatomically distinct (Eddington, et al., 2007; Eddington, et al., 2009).

Regulatory focus theory can also help to explain vulnerability to depression among individuals with GAD. Chronic hyperactivity in the prevention system means that the individual will, on average, spend less time in a promotion-focused state and therefore be less likely to make progress toward important promotion goals, thereby increasing the probability of significant promotion failure. The reduced eagerness from less promotion success and from negative feedback resulting from promotion failure, in turn, further weakens engagement in the promotion system. This weakened engagement not only increases the likelihood of dysphoric symptoms such as anhedonia, sadness, and loss of self-esteem, but also facilitates the hyperactivation of the prevention system and

maintains the individual's GAD symptoms because the promotion system is too weak to effectively inhibit the prevention system.

Both of these general cases illustrate that when one mode of goal pursuit becomes disproportionately active (prevention) or inactive (promotion), it not only impacts the degree of activation of the other system but also the typical adaptive "cross-tuning" of the systems (Higgins, Roney, Crowe, & Hymes, 1994). The adaptive switching of pursuit modes in response to an ever-changing and complex social environment (as well as ongoing feedback regarding progress or lack of progress in goal pursuit) is interrupted and results in heightened risk for the type of psychopathology associated with each of the two regulatory systems.

It also should be noted that there is a natural asymmetry between the two regulatory systems that can be illustrated using the logic of inhibition. Depression involves very low activation of the promotion system, and generalized anxiety involves very high activation of the prevention system. Given hyperactive prevention (generalized anxiety), hypoactive promotion (depression) is very likely because a very strong prevention system will inhibit the promotion system and make it weaker. But given hypoactive promotion (depression), hyperactive prevention (generalized anxiety) need not occur because a weak promotion system could be associated with either a weak or a strong prevention system. And even if reduced eagerness did increase vigilance to some extent – as a compensatory strategy – it need not produce hypervigilance. It could produce a level of vigilance that facilitates effective prevention, and effective prevention

does not produce generalized anxiety disorder. Thus, chronic failure in promotion could, over time, produce generalized anxiety, but it need not. This is consistent with the fact that cases of depression without GAD are more common than cases of GAD without depression (Mineka, et al., 1998).

Evidence

A recent article highlighted some preliminary evidence consistent with the theoretical predictions outlined above using post-hoc analysis of previously gathered data (Klenk, et al., 2011). A group of 92 graduate and professional students were divided into four groups on the following basis: Group 1 was selected to be above the sample median on both kinds of both promotion and prevention failure (as measured by self-discrepancy); Group 2 was above the median on promotion failure but not prevention failure; Group 3 was above the median on prevention failure but not promotion failure; and Group 4 was below the median on both kinds of failure. In addition to the previously established associations between (a) promotion failure and depression symptoms and (b) prevention failure and anxiety symptoms, the analysis showed that failure in one self-regulatory system was associated with higher rates of affective symptoms associated with dysfunction in the other system. That is, individuals with promotion failure not only reported more dysphoric symptoms than the group with neither type of failure, but they also reported a level of anxiety symptoms that was less than those individuals with substantial prevention failure but greater than those experiencing failure in neither system. Similarly, individuals with prevention failure not only showed elevated anxiety

scores, but reported a level of dysphoric symptoms that was less than those individuals with substantial promotion failure but greater than those experiencing failure in neither system. In addition, the results of the analysis were consistent with the kind of asymmetry predicted above. For the anxiety measure, the promotion failure group was about 15% more anxious than the controls, which is in the predicted comorbidity direction of depression producing anxiety but nonetheless is modest in size and certainly allows for depression from promotion failure to occur without anxiety. For the depression measure, on the other hand, the prevention failure group was about 70% more depressed than the controls, which is in the predicted comorbid direction and is a much stronger effect. Here there is much less room for anxiety from prevention failure to occur without depression.

Summary

As illustrated above, regulatory focus theory has important implications not only in terms of the development of depressive and anxious psychopathology, but for the issue of comorbidity as well. While the model outlined above has a variety of attractive features, including its capacity to be studied at multiple levels of analysis, its ready applicability to clinical treatment, and its ability to explain both general trends and exceptions, it awaits empirical validation. This study will provide a test of some of the predictions of regulatory focus theory using longitudinal data. In addition to attempting to replicate previous findings regarding cross-sectional discriminant associations between regulatory failures and symptoms of psychopathology in a different population (an

adolescent sample), this study will also test whether failure in one self-regulatory system predicts associated symptoms of psychopathology over time. It will also test whether failure in one system predicts increased failure in the other system across time.

We chose to test these hypotheses among an adolescent sample gathered from the Wisconsin Study of Families and Work (described below). This research strategy provides a number of advantages. First, by testing the theory in adolescents, we increase the likelihood that participants will not have had prior episodes of major depression or generalized anxiety. This enables us to focus on predicting vulnerability to the disorders with minimal influence of prior pathology. Another advantage of studying adolescents is that they are predictably interacting across multiple contexts in which self-concept and regulatory focus is likely to be relevant (e.g. home, school, with friends). This study uses the Selves Questionnaire –Adolescent Version at one of the assessment time points, which examines self-discrepancy in all three of those domains in order to better measure the construct at this developmental stage. Finally, initial testing of this hypothesis within a broader longitudinal study will allow for subsequent studies examining the link between acquisition of individual differences in regulatory orientation and subsequent regulatory failure and associated psychopathology. Thus, although the study is not primarily developmental in nature, the data to be examined could help to identify important developmental issues (e.g., how individual differences in regulatory focus emerge) which may be of relevance to understanding the etiology of mood and anxiety disorders beginning in adolescence.

III. Research Design and Methods

Recruitment

As mentioned above, this project uses data that was gathered as a part of the Wisconsin Study of Families and Work, which originally began in 1990 as the Wisconsin Maternity Leave and Health (WMLH) Project. Participants were recruited between June 1990 and September 1991 in Milwaukee, WI and Madison, WI metropolitan areas. Participants were recruited through two obstetrics clinics, two clinics of a large HMO, two university hospital clinics, and two hospital clinics that served low-income populations. Patients who were in the second trimester were identified by clinic staff and subsequently screened by a recruiter.

In order to be included, women had to meet the following requirements: (a) between weeks 21 and 25 of pregnancy at time of first contract (b) not a high-risk pregnancy; (c) over the age of 18; (d) not disabled in a way that would significantly alter functioning as a parent; (e) living within standard metropolitan statistical area (SMSA) for Wisconsin or Milwaukee; (f) living with the father of child; (g) either she or father was working for pay or profit; (h) she was either employed or fulltime homemaker (not student or unemployed); (i) have a telephone (for study contact); (j) speak English well enough to understand interviewer; and (k) be sufficiently literate to complete paper-and-pencil questionnaires.

Participants

A total of 1145 potential participants were screened for the study. Of these, 383 (33%) were not eligible for the project. A total of 192 (17%) met inclusion criteria but refused to participate or did not complete the initial assessment. These women were found to be different from women who were eligible and did agree to participate on only two variables. The women who were eligible but did not enroll reported slightly lower number of years of education and slightly higher family income. There were no differences in mother's age, ethnicity, mother's or father's current work status, mother's plan to return to work, or the location of the clinic or city where she was first contacted.

A total of 570 women (50% of those screened, 75% of those eligible) and 550 of their partners agreed to participate in the initial assessment and were included in the study. At time of first assessment, the average age of the mothers was 29.4 years (range 20 to 43) and 95% of the mothers were married to the father. In regard to ethnicity, 93% of the mothers identified as White (non-Hispanic); 2.6% as African American (non-Hispanic); 1.8% as Hispanic; 1.9% as Native American; and 0.7% as Asian American. Although particular effort was made to recruit an ethnically and socioeconomically diverse sample, only 7% of the final sample of mothers identified as of minority ethnicity. Analysis of recruiting data indicated that this was primarily the result of requiring participants be living with the baby's father at time of entry into the study. This criterion was put in place to ensure that fathers were full participants in the study, but had the effect of biasing the sample. Compared to the final sample, women who were

screened out for this reason were more likely to be of minority ethnicity, particularly African American or Hispanic. They were also lower in education, reported a lower family income, were more likely to have been recruited from an inner city clinic, and both the woman and her partner were more likely to be unemployed.

Procedures

Data used in this study was gathered at the 12th, 13th and 15th time points of the study, corresponding to child age 13, age 15, and age 17 respectively. Data provided by mothers was obtained through phone interviews. Data from teachers was obtained by mailing out questionnaires. Data from the teens was gathered during an in-person interview (ages 13 and 15) or phone interview (age 17) in which participants were sent paper-and-pencil questionnaires which they completed while on the phone with a research assistant. Interviews were also audiotaped. Subjects did not receive compensation for their participation. Separate assents and consents were obtained from each participant at each time point.

Measures

Screening questionnaire. Information regarding ethnicity, education, employment, and finances was gathered during screening for eligibility for the study.

Regulatory Focus Questionnaire (RFQ; Higgins et al., 2001). The RFQ is a self-report measure of individual differences in orientation to promotion and prevention goal pursuit consisting of four subscales: (a) Promotion History; (b) Promotion Pride; (c) Prevention History; and (d) Prevention Pride. Pride subscales measure the extent to

which individuals report success in attaining promotion or prevention goals. History subscales measure the extent to which individuals report that they were socialized to value and pursue such goals. There are 22 items, which are answered using a 5 point Likert scale. Higgins et al. (2001) reported that the success scales have been demonstrated to have internal consistency reliability (coefficient alpha) of 0.75 or higher, and a 2 month test-retest reliability (Pearson correlations) of .79 or higher. Psychometric data on the history scales have not yet been published. However, a recent study using the measure found internal consistency values (coefficient alpha) for the Promotion History and Prevention History subscales of .78 and .74, respectively (Strauman, 2006). The RFQ scales are both conceptually and statistically distinguishable from measures of individual differences in dispositional (i.e., temperament-based) approach and avoidance tendencies as well as individual differences in dispositional affectivity. This study uses the history subscales. RFQ was administered at age 13 and age 15 in the Wisconsin Study of Families and Work. Pearson's correlations across the two year time span were .51 for promotion history and .43 for prevention history. This study uses scores from both age 13 and age 15 assessments. Use of contemporaneous scores seemed appropriate given that parental socialization was ongoing and potentially subject to change over time in response to development and other environmental influences.

Selves Questionnaire (SQ; Higgins, et al., 1986). The Selves Questionnaire was administered to children at age 13 to measure discrepancies between the attributes participants believed they had and the attributes they ideally wanted to have and the

attributes they felt they ought to have. Participants generated lists of up to 10 traits for each self-domain: actual self, ideal self, and ought self. Scoring of the Selves Questionnaire was conducted in the standardized fashion described by Higgins and colleagues (1986). Each attribute of the ideal self and the ought self was compared to each attribute on the actual self list using Webster's New World Roget's A-Z Thesaurus (Laird, 1999). Four types of attribute-pair associates were calculated: (a) attributes synonymous with an actual self attribute were coded as *matches*; (b) attributes that were synonymous with an actual self attribute but varied in degree were coded as *mismatches of degree*, (c) attributes that were antonymous with an actual self attribute were coded as *mismatches*, and (d) attributes that were neither synonymous nor antonymous with any actual self attributes were coded as *nonmatches*. Self-discrepancies were calculated by subtracting the number of matches (weighted by a factor of -1) from the number of mismatches of degrees (weighted by a factor of +1) and the number of mismatches (weighted by a factor of +2). Nonmatches were not included in the calculations. Thus positive scores represent higher levels of discrepancy and negative scores represent lower levels of discrepancy. Inter-rater reliability ratings for the types of self-discrepancy ratings have been found to range between 0.84 to 0.97 (Strauman, Vookles, Berenstein, Chaiken, & Higgins, 1991; Tangney, et al., 1999). The validity of this measure has been supported by numerous correlational and experimental studies (Strauman & Higgins, 1993).

Selves Questionnaire – Adolescent Version (SQA). The SQA is an adapted version of the Selves Questionnaire designed specifically for the WSWF. It was administered to the teenagers at age 15. In it, participants are asked to list 3 ideal attributes, 3 ought attributes, and 2 feared attributes in three different social contexts: at school, at home, and with friends. The specification of different contexts was done in recognition of the fact that as children enter adolescence that are able to evaluate themselves in more domains and these evaluations are frequently orthogonal (Harter, 1986; Marsh, Parker, & Barnes, 1985). Participants were then asked to use a Likert rating scale from 1 (not at all) to 7 (extremely) to rate the extent that they currently believed they possessed these various attributes. Participants were also asked to rate how successful they believed they would be in the future in achieving their ideal qualities using the Likert scale. Ideal and ought self-discrepancies were calculated by subtracting the actual rating from 7, and averaging for each domain (home, school, and friend). These values were weighted by the reverse of their expectancy rating (subject's rating of his/her belief that he/she would be successful in achieving ideal selves in each domain) and then summed. Feared self-discrepancies were calculated by summing. For each variable, higher scores represent more discrepancy. This type of discrepancy calculation is based on the calculation of self-discrepancy used by the computerized Selves Questionnaire (Higgins, Shah, & Friedman, 1997). Reliability information is not currently available, but it is expected to be similar to other versions of the Selves Questionnaire.

MacArthur Health and Behavior Questionnaire (HBQ; Armstrong, Goldstein, & The MacArthur Working Group on Outcome Assessment, 2003). The HBQ was used to assess teenager mental health symptoms. Data was gathered from the mother and the teenager at all three time points used in this study (age 13, 15, and 17). Data was gathered from teachers at child age 13 and 15. Mothers and teachers rated either 16 or 18 items for the depression subscale, and either 12 or 14 items for the overanxious (generalized anxiety) subscale, depending on the time point. (For more details about items and changes in items between time points, please see Appendix.) They rated each item on a 3-point scale: 0 (*never or not true*), 1 (*sometimes or somewhat true*), 2 (*often or very true*). Teenagers rated either 13 or 15 items for depression subscale and either 13 or 15 for overanxious subscale, depending on the time point. Teenagers were presented with pairs of statements and asked to choose the statement from each pair that was most like them. They then rated that statement as being “*sort of like me*,” “*mostly like me*,” or “*really like me*.” Responses were coded on a 6 point scale based on which statement was selected (positive or negative) and which rating was selected: “*really like me*,” “*mostly like me*,” “*sort of like me*.” HBQ internal consistency estimates (Cronbach α coefficient) have been found to range between 0.70-0.96 for all reporters for data from this study at age 13 and age 15. Test-retest reliability (Spearman ρ) for mother and teacher report using a time period of 7-10 days ranged between 0.71 and 0.88 for internalizing symptoms. Mother’s assessment has demonstrated moderately high stability over a one year period (0.64 for overanxious and 0.57 for depression), suggesting that the measure is

able to capture change over time. Studies have also found that the HBQ is more sensitive to internalizing problems than the Diagnostic Interview Schedule for Children Version-IV (Shaffer, Fisher, Lucas, & The NIMH DISC Editorial Board, 1998). The HBQ subscales have “core” scores which combine reports of child, teacher, and mother using the Principal Components Analysis (PCA) approach described by Kraemer and colleagues (2003) to create a measure of a “core characteristic.” This method is thought to be more reliable and valid than single reporter scores or simple combinational approaches that do not control for extreme variance. However, due to the high correlations between the overanxious and depression subscales, this study did not use the above described core scores, but used a subset of child self-report items from depression and overanxious scales (see Analysis section for more details.)

IV. Analysis

Preparatory Analyses

Most of the variables were found not to be normally distributed according to examination of the histogram, examination of skewness and kurtosis, the Shapiro-Wilk test, and Kolmogorov-Smirnov test with Lilliefors significance corrections. These variables included: RFQ (age 13 and 15), self-discrepancy at age 15, HBQ depression and overanxious core scores; and subset scales created by factor analysis (described in more detail below). These variables were normalized using square root transformations to correct for skewness and kurtosis. Transformations were successful in moving variables significantly closer to normality, so these transformed variables were used in all analyses. Age 13 self-discrepancies were also not quite normally distributed. However, efforts to transform them moved them further away from a normal distribution. As a result, the original versions of these variables were used in the analyses.

Analyses of study dropouts

A series of t-tests and Chi-square tests were performed in order to identify whether families for which data were available at ages 13, 15, and 17 were significantly different on demographic variables from the families who dropped out of the study before those assessments (See Table 1). Continuing participants and study drop-outs were largely similar. Among the continuing participants, mothers were slightly older

Table 1: Comparison of Sample

Demographic Data reported at Time 1	Continuing Participants N=398	Study Drop-outs N=172	Test Statistic
Average age of mothers	<i>M</i> =29.70	<i>M</i> =28.59	<i>t</i> (568)=2.82, <i>p</i> =.005**
Ethnicity of mothers			χ^2 (4)=5.13, <i>p</i> =.274
Indian/Alaskan Native	2.26% (n=9)	1.16% (n=2)	
Asian/Pacific Islander	0.75% (n=3)	0.58% (n=1)	
Black (non-Hispanic)	2.51% (n=10)	2.91% (n=5)	
White (non-Hispanic)	93.47% (n=372)	91.86% (n=158)	
Hispanic	1.01% (n=4)	3.49% (n=6)	
Other	0.00% (n=0)	0.00% (n=0)	
Education			χ^2 (6)=4.95, <i>p</i> =.550
< HS Degree	1.76% (n=7)	1.74% (n=3)	
HS Degree	14.07% (n=56)	18.60% (n=32)	
Post HS Training	9.80% (n=39)	9.30% (n=16)	
Some College	18.34% (n=73)	23.26% (n=40)	
College Degree	36.68% (n=146)	30.81% (n=53)	
Some Post College	7.79% (n=31)	6.98% (n=12)	
Professional Degree	11.56% (n=46)	9.30% (n=16)	
Family Income	<i>M</i> =\$50,688	<i>M</i> =\$47,836	<i>t</i> (563)=1.33 <i>p</i> =.190
Marital Status			χ^2 (2)=4.72, <i>p</i> =.940
Married	95.98% (n=382)	91.86% (n=158)	
Separated	0.00% (n=0)	0.00% (n=0)	
Divorced	1.01% (n=4)	1.16% (n=2)	
Widowed	0.00% (n=0)	0.00% (n=0)	
Never Married	3.02% (n=12)	6.98% (n=12)	
# of Previous Children	<i>M</i> =1.03	<i>M</i> =1.02	<i>t</i> (568)=.02 <i>p</i> =.990
Sex of child			χ^2 (1)=0.22 <i>p</i> =.637
Male	47.74% (n=190)	50.00% (n=75)	
Female	52.26% (n=208)	50.00% (n=75)	

** = significant at the *p*<.05 level

than study drop-outs. However, the difference was only 1.11 years and thus is unlikely to have a great deal of practical significance in terms of influencing the results or interpreting findings. In Table 1 analyses, for the ethnicity of the mothers and for marital status, more than 20% of the cells had expected cell counts of less than 5, which suggest that the Chi-square results might not be valid. As a follow-up, a Chi-square test was conducted on these items after grouping categories with small cell counts together. For marital status, the continuing study sample was more likely to be married ($X^2(1)=4.09$, $p=.043$), while the drop-out sample was more likely to have never been married ($X^2(1)=4.67$, $p=.031$). There was no difference in terms of white vs. non-white ethnicity of the mothers between continuing participants and drop-out sample, ($X^2(1)=.48$, $p=.491$).

Examination of the Selves Questionnaires (Original and Adolescent Version)

The age 13 original Selves Questionnaire ideal discrepancy had a range of -6 to 6, a mean of 0.69, and a standard deviation of 2.21. Ought discrepancy had a range of -5 to 7, a mean of -0.31, and a standard deviation of 1.81. A discrepancy score of zero indicates, approximately speaking, a relative balance of congruency vs. discrepancy. These means indicate that, on average, adolescents had some ideal self-discrepancy but little ought self discrepancy. These means and standard deviations were comparable to those found in prior studies using undergraduate samples, which also tended to find that participants reported less ought discrepancy than ideal discrepancy. Prior to variable transformation, the age 15 Selves Questionnaire-Adolescent Version ideal discrepancy

had a range of 0-27.33, a mean of 6.64, and a standard deviation of 5.38. Ought self-discrepancy had a range of 0-35.33, a mean of 6.25, and a standard deviation of 5.91. Feared self-discrepancy had a range of 6-29, a mean of 12.81, and a standard deviation of 4.38. Since this questionnaire was developed specifically for the present study, no comparison data were available from prior samples.

In order to explore the associations among types of self-discrepancy, Pearson correlations were determined. At age 13, ideal self-discrepancy and ought self-discrepancy were moderately correlated, Spearman's $r=.38$, $p<.001$. However, at age 15, ideal self-discrepancy and ought self discrepancy were highly correlated, Pearson's $r=.81$, $p<.001$. Also at age 15, feared self-discrepancy was moderately correlated with both ought self-discrepancy (Pearson's $r=.45$, $p<.001$) and ideal self-discrepancy (Pearson's $r=.44$, $p<.001$). While the feared self-discrepancy correlations are mostly consistent with previous research, the correlations between ought and ideal self-discrepancies at age 15 are much higher than expected (Carver, Lawrence, & Scheler, 1999; Rodebaugh & Donahue, 2007; Strauman & Higgins, 1988). Such a high level of correlation presented a serious statistical challenge to our ability to test study hypotheses, making it much more difficult to detect discriminant associations between different types of self-discrepancy and depressive vs. anxious affect.

Our hope was that the two different measures of self-discrepancy, the Selves Questionnaire, which was administered at age 13, and the Selves Questionnaire – Adolescent Version, which was administered at age 15, would be equivalent. In order to

test this, we calculated self-discrepancy correlations across time points. Ought self-discrepancy at age 13 was correlated with ought self-discrepancy at age 15, Spearman's $r=.17, p<.003$. Ideal self-discrepancy at age 13 was correlated with ideal self-discrepancy at age 15, Spearman's $r=.19, p=.001$. These correlations are smaller than expected. Prior research has found substantial correlation over a 3 year period using college students (age $M=19.2, SD=2.4$); for actual-ideal discrepancy, $r=.42, p<.010$; for actual-ought discrepancy, $r=.45, p<.010$. (Strauman, 1989, 1996). This suggests that either self-discrepancies are more unstable at younger ages and/or the two measures are not conceptually and statistically equivalent. These relatively low correlations also raised the possibility that the original Selves Questionnaire may not have been functioning as expected among this age group.

Measuring Anxiety and Depression

Given the high rates of comorbidity between anxiety and depression, the relationship between the core scores for HBQ Depression and Overanxious subscales was examined. We found them to be highly correlated: at age 13, Pearson's $r = 0.73, p <.001$; at age 15, Pearson's $r = 0.81, p <.001$; and at age 17 Pearson's $r = 0.81, p <.001$. While a correlation of these types of symptoms is not terribly surprising given rates of comorbidity discussed earlier, it posed problems for testing the hypotheses outlined above. Specifically, it created problems in terms of using self-discrepancy to discriminantly predict symptoms over time.

As a result, we conducted an exploratory factor analysis (EFA) to determine whether there were two separable, less highly correlated factors to serve as proxies for the experiences of dejection/sadness and anxiety/worry that could be used to test the hypotheses of interest. We used child-self report HBQ items in this factor analysis because all previous studies of regulatory focus theory have used individual self-report and there was no reason to believe that parent or teacher report would increase validity of the assessment of a primarily internal experience. The EFA was computed using SPSS v. 19 using principal components analysis and varimax rotation. Varimax rotation was used in order to create factors with limited correlation. The number of factors was determined using four criteria: 1) eigenvalues greater than one, 2) examination of the scree plot, 3) only interpretable factors were included, and 4) only items that made conceptual sense within their cluster were included. Two factors were suggested and explained 40.66% of the total item variance. The cutoff value for the loading of the factors was set to .50 to produce strongly related factors. Factor 1 was composed of 7 items and accounted for 32.53% of the variance. All items were from the HBQ depression subscale. These items were conceptualized as measuring *depressive experience*. Table 2 shows factor items. Factor 2 was composed of a total of 5 items and accounted for 8.13% of the variance. Of the 5 items, 4 were from the overanxious subscale and 1 was from the depression subscale (“Things bother me a lot”). These items were conceptualized as measure of *anxious experience*. Internal consistency was examined for each of the three factors using alpha reliability coefficients. Results found

high internal consistency for depressive experience ($\alpha = .89$) and anxious experience ($\alpha = .79$). This procedure was successful in identifying factors that were less highly correlated than the total subscale scores, although they were still clearly related: at age 13 Pearson's $r = .56, p < .001$; at age 15 Pearson's $r = .54, p < .001$; and at age 17 Pearson's $r = .53, p < .001$.

Table 2: Factor Analysis

Factor 1: Depressive Experience HBQ Child/Adolescent Items	Factor 2: Anxious Experience HBQ Child/Adolescent Items
I'm not a happy kid/person. I am a happy kid/person.	I worry about things I've done. I don't worry about the things I've done.
I feel like crying most days. I don't feel like crying most days.	When I'm worried about something, it's hard for me to stop worrying about it. When I'm worried about something, it's not hard for me to stop worrying about it.
I don't like myself. I like myself.	I don't worry bad things are going to happen. I worry bad things are going to happen.
I'm a lonely kid/person. I'm not a lonely kid/person.	I don't worry a lot. I worry a lot.
Nothing will ever work out for me. Things will work out for me O.K.	Things bother me a lot. Things don't bother me a lot.
I'm a sad kid/person. I'm not a sad kid/person.	
I have fun in many things. I don't have fun in anything.	

The preliminary factors were verified by conducting the same factor analysis for age 15 and age 17. At these ages, almost all the items selected above loaded in the same

way above the same .50 threshold. The one exception was that the “Things bother me a lot” item dropped slightly below the threshold to .48 at age 15. Since the item would meet threshold if rounding were used, this item was kept. Internal consistency remained high across the time points. At age 15, $\alpha = .86$ for depressive experience and $\alpha = .81$ for anxious experience. At age 17, $\alpha = .89$ for anxious experience and $\alpha = .82$ for anxious experience.

Depressive experience had a possible score range of 7-42, while anxious experience had a possible range of 5-30. Means and standard deviations for these two factors were fairly stable across time points (See Table 3). Mean depressive experience at age 17 was slightly higher than at age 13 ($t(1,335)=3.19, p=.002$) and age 15 ($t(1,345)=2.08, p=.040$), but the difference is negligible in size. No other differences

Table 3: Statistics for Depressive and Anxious Experience

Factor	Age 13	Age 15	Age 17
Depressive Experience	$M=11.80$ $SD=5.09$	$M=12.09$ $SD=4.81$	$M=12.67$ $SD=5.05$
Anxious Experience	$M=14.67$ $SD=4.83$	$M=15.09$ $SD=5.16$	$M=15.14$ $SD=5.06$

were statistically significant. Scores were not normally distributed and so were transformed using a square root transformation, which brought distribution closer to normal but also reduced range and standard deviation. For transformed depressive

experience factor, actual range of scores was 1-5.66, means ranged from 2.21-2.40, and standard deviations ranged from .94-.98. For transformed anxious experience factor, actual range of score was 1-5.00, means ranged from 2.99-3.09, and standard deviations ranged from .81-.84. The low level of depressive and anxious experience reported by the participants, in addition to the limited range of the scales (especially after transformation) also served to increase the difficulty of finding discriminant relationships between types of self-discrepancy and affective experience.

Assessment of cross-sectional associations between self-discrepancy and affective experience associated with psychopathology

In order to assess the cross-sectional associations between self-discrepancy and affective experience, a pair of hierarchical multiple regression analyses were conducted. These analyses were performed in an attempt to replicate previous findings regarding discriminant associations between ideal self-discrepancy and depressive affect and ought self-discrepancy and anxious affect. For age 13 variables (using the original Selves Questionnaire), the expected discriminant associations between variables were not found. Specifically, when controlling for ought self-discrepancy, ideal self-discrepancy did not predict depressive experience ($F(1, 330) = 2.04, \beta = .09, p = .150$). Similarly, when controlling for ideal self-discrepancy, ought self-discrepancy did not predict anxious experience ($F(1, 330) = .79, \beta = .05, p = .370$).

These relationships were assessed at age 15 as well (using the Selves Questionnaire – Adolescent Version), and partial support was found for this hypothesis.

When controlling for ought self-discrepancy, ideal self-discrepancy predicted depressive experience ($F(1, 375) = 11.67, \beta = .27, p = .001$). Individuals who had higher levels of ideal self-discrepancy had higher levels of depression. After controlling for ought self-discrepancy, ideal self-discrepancy explained 2.6% of the variance in depressive experience. Total variance explained by the model was 16.4%. However, when controlling for ideal self-discrepancy, ought self-discrepancy did not predict anxious experience ($F(1, 374) = 1.54, \beta = .10, p = .220$).

Since feared self-discrepancy has been proposed by some investigators as being more directly related to anxious affect and representation of prevention failure than ought discrepancy (Carver, Lawrence, & Scheier, 1999), and the feared self-discrepancy was assessed in the SQA, the relationship between feared self-discrepancy and anxious experience was examined as a supplementary analysis. When controlling for ideal and ought self-discrepancy, feared self-discrepancy at age 15 predicted anxious experience ($F(1, 372) = 8.42, \beta = .16, p = .004$). Individuals who believed they were closer to their feared self had higher levels of anxiety. After controlling for ought and ideal self-discrepancies, the feared self-discrepancy explained 2.0% of the variance in anxious experience. Total variance explained by the model was 9.1%.

As it appeared that feared self was serving as a better proxy for prevention failure, the previous analysis examining the connection between ideal self-discrepancy and depressive experience was repeated, controlling for feared self-discrepancy in addition to ought self-discrepancy. It did not substantially change the results ($F(1, 373) = 9.78, \beta =$

.25, $p=.002$). Similarly, controlling for feared self-discrepancy did not substantially change the results of the analysis examining the relationship between ought self-discrepancy and anxious experience ($F(1, 372) = .50, \beta = .06, p=.480$).

Assessment of the meditational role of promotion and prevention history

As discussed above, we hypothesized that the impact of ideal self discrepancy on depressive symptoms would be moderated by promotion history, such that those with a weak promotion system would be more vulnerable to depression in the wake of promotion failure. This hypothesis was tested using a hierarchical regression. The criterion variable was depressive experience at age 13, step 1 was ought discrepancy at age 13, step 2 was ideal discrepancy at age 13, step 3 was promotion history at age 13, and step 4 was the interaction of promotion history and ideal discrepancy. This model was not significant, ($F(1, 327) = 1.52, \beta=.06, p=.220$). However, promotion history was a significant predictor, with $\beta = -.37, p<.001$), indicating that individuals with a stronger promotion history had lower levels of depressive experience. After controlling for ought and ideal discrepancy, the addition of promotion history explained 13.0% in the variability of depressive experience.

The same type of regression was used to test this relationship at age 15, only with the addition of controlling for the feared self-discrepancy in step 1 and using promotion history score from age 15. This model was not significant, ($F(1, 371) = .86, \beta=.04, p=.350$). As in the age 13 analysis, promotion history alone was a significant predictor, with $\beta = -.24, p<.001$, again indicating that individuals with a stronger promotion history

had lower levels of depressive experience. The addition of promotion history explained 4.3% in the variability of depressive experience. This is lower than at age 13 because at age 15, other elements in the model had already explained some of the variance in depressive experience (e.g. ideal discrepancy).

We had also predicted that the impact of ought self discrepancy on anxiety symptoms would be moderated by prevention history, such that those with a *strong* prevention system would be more vulnerable to anxiety in the wake of prevention failure. Despite the fact that at age 13 and 15 ought discrepancy did not show an association with anxious experience in earlier analyses, we nevertheless tested this hypothesis with hierarchical regression. For the first analysis, Step 1: ideal discrepancy at age 13, step 2: ought discrepancy at age 13, step 3: prevention history at age 13, and step 4: interaction of prevention history and ought discrepancy. This model was not significant, ($F(1, 326) = 1.24, \beta = -.06, p = .270$). Prevention history alone was not a significant predictor ($\beta = .01, p = .900$). This analysis was repeated with age 15 data with the addition of controlling for feared self-discrepancy in the first step of the model. This model was not significant, ($F(1, 369) = 3.48, \beta = .09, p = .060$). Prevention history alone was not a significant predictor ($\beta = -.00, p = .970$).

Since earlier analysis suggested that feared self-discrepancy might be a better construct to serve as proxy for significant prevention failure, we also used this variable to assess for potential moderating relationship of prevention history. We again used a hierarchical regression: Step 1: ideal and ought discrepancy at age 15, step 2: feared

discrepancy at age 15, step 3: prevention history at age 15, and step 4: interaction of prevention history and feared discrepancy. This model was not significant, ($F(1, 369) = .97, \beta = .05, p = .330$). Prevention history alone was not a significant predictor ($\beta = -.10, p = .840$).

Assessment of longitudinal predictive associations between self-discrepancy and affective experience associated with psychopathology

In order to assess the predictive associations over time between self-discrepancy and affective experience associated with psychopathology, another series of hierarchical multiple regression analyses were conducted. Since self-discrepancy is postulated to not only have a discriminative but a causal relationship to depressive and anxious symptoms, we had originally predicted that ideal self-discrepancy would predict depressive experience over time and ought self-discrepancy would predict anxious experience over time. Since age 13 self-discrepancies had not predicted depressive or anxious experience cross-sectionally, we did not use them to test this hypothesis. Instead we restricted ourselves to testing this using age 15 self-discrepancy data. Similarly, in light of the lack of association between ought self-discrepancy and anxious experience at age 15, we did not use ought self-discrepancy to predict anxious affect over time. Instead, we tested whether feared self-discrepancy would predict anxious affect over time.

After controlling for depressive experience at age 15 (step 1), and feared and ought self-discrepancy at age 15 (step 2), ideal self-discrepancy at age 15 did not predict depressive experience at age 17 ($F(1, 335) = .08, \beta = .02, p = .780$). As would be

expected, depressive experience at age 15 was a significant predictor of depressive experience at age 17 ($\beta = .60, p < .001$) with an adjusted R squared of .36. We noted that the age 15 ideal self-discrepancy could be predicting the same variance in depressive experience at age 17 that was being predicted by depressive experience at age 15. In order to assess this, we ran the regression without controlling for age 15 depressive experience. This model was not significant, ($F(1, 338) = 3.25, \beta = .15, p = .070$).

After controlling for anxious experience at age 15 (step 1) and ideal and ought self-discrepancy at age 15 (step 2), feared self-discrepancy at age 15 did not predict anxious experience at age 17 ($F(1, 334) = .82, \beta = -.05, p = .370$). As would be expected, anxious experience at age 15 was a significant predictor of anxious experience at age 17 ($\beta = .56, p < .001$), accounting for 30.8% of the variance. Since the age 15 feared self-discrepancy could be predicting the same variance in anxious experience at age 17 that was being predicted by anxious experience at age 15, we ran the regression without controlling for age 15 anxious experience. However, this model was not significant, ($F(1, 338) = .59, \beta = .05, p = .450$).

Since we were aware of the problems presented by the high correlations between ideal and ought self-discrepancy in testing for discriminate relationships, we also assessed whether combined self-discrepancy at age 15 (ideal, ought, and feared), predicted combined anxious and depressive experience at age 17 after controlling for the latter at age 15. The model was significant, ($F(1, 336) = 4.27, \beta = .10, p = .040$). Change in R squared for this step was only .008 and it should be noted that after controlling for

the running of multiple regressions this result does not remain significant (see section on Type I Error below). However, the fact that combined self-discrepancy at age 15 appeared to have predictive power over and above distress at age 15 in predicting distress at age 17 is notable and certainly in line with the RFT's predictions regarding causality.

Assessing the longitudinal predictive association between promotion and prevention failure

According to the proposed extensions of regulatory focus theory discussed above, significant failure in one system should predict significant failure in the other system at a subsequent time. As operationalized in this study, this would mean that ideal self-discrepancy at age 13 should predict ought self-discrepancy at age 15 and ought self-discrepancy at age 13 should predict ideal self-discrepancy at age 15. However, the fact that at age 13 neither one of the discrepancies showed the expected affective association raises questions about whether they were reliable proxies for significant promotion and prevention failure. Nevertheless, since using those measures was the only way possible to test this particular hypothesis in the present sample, we ran the planned hierarchical analyses. In order to assess whether ought self-discrepancy at age 13 predicted ideal self-discrepancy at age 15, we conducted a hierarchical regression with ideal self-discrepancy at age 15 as the criterion variable: step 1: ideal self-discrepancy at age 13, step 2: ought self-discrepancy at age 13. The model was not significant, ($F(1, 306) = 1.85, \beta = .08, p = .170$). In order to assess whether ideal self-discrepancy at age 13 predicted ought self-discrepancy at age 15, we conducted a similar hierarchical regression

with ought discrepancy at age 15 as the criterion variable: step 1: ought self-discrepancy at age 13, step 2: ideal self-discrepancy at age 13. The model was not significant, ($F(1, 305) = 1.29, \beta = .07, p = .260$).

Regression Diagnostics

The results of the regression analyses summarized above were examined to evaluate assumptions of independent errors, multicollinearity, normality of residuals, and homoscedasticity. No assumptions were violated, suggesting that earlier transformations of variables which were not normally distributed were sufficiently effective. The lack of violated assumptions also suggested that the lack of support for certain hypotheses could not be accounted for by those types of statistical considerations.

Controlling for Type I Error

A total of 19 regressions were run in the course of the analyses. The running of multiple analyses raises the chances of Type I error. Therefore a Šidák correction for multiple comparisons was run. According to this correction strategy, in order to maintain significance at the .05 level, all p s must not exceed .0029. All statistically significant findings remained significant, except for the combined self-discrepancies at time 15 predicting combined distress at age 17, as noted above.

Estimates of Statistical Power

We had a minimum sample size of 331 for our hierarchical regressions with 4 predictors. We had a minimum sample size of 375 for our hierarchical regressions with 5

predictors. (Differences in sample sizes were the result of some subjects missing Selves Questionnaire data from age 13.) This results in power of .86 and .88, respectively, to detect the recommended minimum effect size (RMES), which represents the minimum finding for a “practically” significant effect in social science data (Ferguson, 2009).

V. Discussion

The hypotheses regarding cross-sectional associations between ideal self-discrepancy and depressive affect and between ought self-discrepancy and anxious affect were not supported in the age 13 analyses, which used the original Selves Questionnaire. This is notable, since this association has been found numerous times in the literature (Higgins, 1987; Higgins, et al., 1986; Higgins, et al., 1997). There are a number of possible factors that might be relevant in understanding this failure to find the expected relationships at age 13. A number of researchers have argued that the Selves Questionnaire, especially when used alone, is limited in its ability to capture self-discrepancy and that studies of self-discrepancy and related theories would benefit from the use of alternate instruments which have additional structure and specificity as well as different psychometric characteristics (Rodebaugh & Donahue, 2007). In addition, the original Selves Questionnaire was formulated for use with adults and older adolescents. This is the first use of the standard Selves Questionnaire we are aware of in a younger population. It is possible that the average 13 year old lacks the conceptual skills and insight necessary to accurately communicate about self concepts and personal attributes in the way required by the instrument. It is also possible that 13 year olds have self-

beliefs and self-concepts that are relatively unstable and thus capturing a discrepancy at a given moment in time is not necessarily an accurate assessment of overall sense of self. This issue of how to capture an accurate sense of self when that sense of self is in flux is one of the reasons that the Selves Questionnaire –Adolescent Version purposefully assessed across multiple domains and included queries about likelihood of success.

Consistent with the idea that age appropriateness of the original Selves Questionnaire measure might have been an issue, more support for regulatory focus theory was found at age 15, when the Selves Questionnaire-Adolescent Version was used. In those cross-sectional analyses, ideal self-discrepancy was a significant predictor of depressive experience. However, ought self-discrepancy was not a significant predictor of anxious experience. Although this is contrary to predictions, it is somewhat consistent with the literature in that the association between ought discrepancy and agitation tends to be weaker and more difficult to find than that between ideal discrepancy and dejection (Boldero & Francis, 2000; Higgins, Klein, & Strauman, 1985). Another factor is that the correlation between the ideal and ought self-discrepancies at age 15 were extremely high ($r=.81$), which creates a very difficult statistical scenario in which to find discriminant effects. The fact that the expected relationship between ideal and depressive experience was found despite this challenge, is notable. Unlike ought self-discrepancy, feared self-discrepancy was a significant predictor of anxious experience at age 15, lending support to those who argue that the feared self might be a better way to operationalize prevention goals, because it is more strongly linked to

prevention related affect (anxiety) and strategies (avoidance) (Carver, Lawrence, & Scheier, 1999). It is also likely relevant that feared self-discrepancies at age 15 were much less highly correlated with ideal and ought self-discrepancies at age 15 than ideal and ought self-discrepancies were with each other.

We had also expected that promotion and prevention history (the degree to which the children were socialized to have a promotion and prevention focus) would interact with ideal and ought self-discrepancy to predict anxious and depressive experience. We did not find any such interactions. However, we did find that promotion history was a significant predictor of depressive experience, such that reporting a history of weak socialization towards promotion goal pursuit was associated with having higher levels of depressive experience at both age 13 and age 15. This suggests that, consistent with our hypothesis, having a weak orientation towards promotion may serve as a vulnerability factor for depressive experience. This finding is reminiscent of results from a trial of Self-System Therapy (SST) which showed that depressed patients who lacked strong socialization towards promotion goal pursuit showed significantly greater improvement with SST (Strauman, et al., 2006), which specifically targets self-regulation via promotion and prevention goals, compared to standard cognitive therapy . Together, these findings not only demonstrate that low promotion orientation is associated with depression (at least for some), but also suggest that such an orientation plays an integral role in causing or maintaining some people's depression. Finding this association between lack of promotion socialization and depressive experience again among a

community sample suggests that it might be useful to investigate self-reported low promotion history as a risk factor in the development of depression.

Self-discrepancy did not discriminantly predict associated affect over a two year time span, in contrast to our hypotheses. Self-regulatory theory holds that significant promotion and prevention failure can lead, respectively, to depressive and anxious affect and related pathology. The conceptualized causality is clear, and so the failure to find a longitudinally predictive relationship between age 15 self-discrepancy and age 17 affective experience raises some questions. Although priming studies do strongly support a causal relationship between activation of self-discrepancy and short-term dysphoric and anxious affect, it may be that the relationship is more bi-directional in nature when assessed longitudinally. Alternately, the relationship could be strongly causal but the 2 year lapse between assessments was too long a period of time to capture this, especially during adolescence, as it is typically a time of frequent and significant change and growth. In discussing this interpretation of the results, we again must note that the high correlation between the ideal and ought self-discrepancy at age 15 makes the finding of discriminate associations over time more difficult, although this does not explain the failure to find this association with the feared self-discrepancy which was less highly correlated. In addition, across all three time points reports of anxious and depressive experience were relatively low which also would have made the finding of the expected relationship more difficult. The fact that there was a trend toward combined self-discrepancies at age 15 predicting combined anxious and depressive experience at age 17,

even after controlling for combined anxious and depressive experience at age 15, is also in line with RFT's conception of causality. Together, this suggests that in order to more fully assess this relationship it would be helpful to use a study design with much shorter time lapses between assessments, using at least one other operationalization of self-regulatory functioning in addition to the one based on participant reports of ideal, ought, and feared self-discrepancy, and use a higher risk or more distressed sample.

Also contrary to the hypotheses, significant failure in one system (as measured by self-discrepancy) did not predict increasing levels of dysfunction in the other system (as measured by self-discrepancy). Ideal self-discrepancy at age 13 did not predict ought self-discrepancy at age 15, and ought self-discrepancy at age 13 did not predict ideal self-discrepancy at age 15. It is difficult to assess the meaning of this finding. On the most simplistic level, it raises doubts about the prediction that significant failure in one system will tend to lead to significant failure in the other system. However, it is important to note again the various factors that likely interfered with our ability to find such a relationship including: the likelihood that the self-discrepancy assessment at age 13 was not performing as expected, the extremely high correlation between ideal and ought self-discrepancy at time 15, and the inability to assess these relationships using the feared self (as it was only available at age 15). Given these issues it seems premature to dismiss this hypothesis - especially since doing so would raise important questions about regulatory focus theory, specifically the assertion that the systems are mutually inhibitory under

normal circumstances and that dysfunction in one system can increase the likelihood of dysfunction in the other.

This study has a number of limitations, many of which have already been mentioned above. The inclusion criteria resulted in a sample with limited participants of low income and minority ethnicity, and exclusion of single parent households, which necessarily limits the generalizability of the findings. The sample also was not at unusually high risk for mood or anxiety disorders and levels of distress were low. Self-discrepancy levels were relatively low as well. Correlations between ideal and ought self-discrepancies were unexpectedly high at age 15. In addition, self-discrepancy data was only available at two points and each time point used a different version of the Selves Questionnaire, which was not optimal from either a methodological or a conceptual standpoint. The original Selves Questionnaire has not yet been validated for adolescents of age 13, which limits confidence in its appropriateness for use in testing study hypotheses. While we believe change from the original Selves Questionnaire to the Selves Questionnaire-Adolescent Version was a methodological improvement, it nevertheless complicates attempts to assess self-discrepancy over time. The two year time lapse between assessments of self-discrepancy also limits the conclusions that we can draw. For instance, does a lack of association reflect the absence of a relationship (which would indicate an interesting difference between adolescents and young adults) or does is this relationship simply obscured by the impact of other important factors during the two year period?

The high correlations between the HBQ depression and overanxious subscales also presented a challenge in testing hypotheses and led to the use of subsets of HBQ items to form ad-hoc measures of dysphoric and anxious affect. It should be noted that those ad-hoc measures have not been validated for such use and had a limited range and small standard deviation after transformation, which also may have hampered our ability to find the predicted relationships. And even the ad-hoc measures were substantially intercorrelated, which in combination with the intercorrelations among self-discrepancy scores created a statistical scenario in which it was difficult to detect significant and discriminant associations either cross-sectionally or over time. Finally, the fact that we used RFQs which were administered contemporaneously with measures of psychopathology raises the possibility that depressive and/or anxious symptoms present at the time may have influenced recollection and reporting of those socialization patterns and practices to which the adolescents were exposed.

Despite these limitations, we believe that the study findings are helpful in adding to the literature on self-regulatory theory. The finding of cross-sectional relationships at age 15 between ideal discrepancy and depressive affect/experience and between feared self-discrepancy and anxious affect/experience suggests that self-discrepancy becomes an important construct during adolescence. Even if those predicted associations are not present at earlier points in development, establishing that they coalesce around that age would have important implications for developmental theory as well as for our understanding of the etiology of mood and anxiety disorders. The finding that low

promotion history predicted depressive symptoms at age 13 and age 15 suggests that assessing promotion and prevention strength and orientation in childhood may help us better understand developmental pathways of vulnerability for depression and identify it as a possible area for preventive interventions. As far as the impact of significant failure in one system on the other system, and the possibility of the relative strength and function of the two systems playing a role in explaining depressive/anxious comorbidity, this remains a largely open question. Although this study did not yield evidence in support of such a relationship, the limitations discussed above are also likely to have hampered our ability to detect it. Further investigation, which addresses the issues raised by this study in terms of assessment and methodology, will be needed to more definitively answer the question of how significant failure in one self-regulatory system affects the functioning of the other system.

The present study raises a number of additional questions for future exploration including: (a) when does self-discrepancy become a stable and reliable construct during development, (b) what is the nature of the association between self-discrepancy and psychopathological symptoms during adolescence – is it predominantly causal (as RFT argues) or is it primarily bi-directional, (c) is self-discrepancy equally associated with depressive and anxious symptoms across all adolescents or are there additional mediating factors in terms of personality, parenting, or experience, (d) is there a threshold at which low promotion orientation has a negative effect or is the relationship strictly linear? Study findings also suggest that additional work on the issue of measurement is necessary

to develop and determine the most appropriate and effective ways to assess self-discrepancy and other RFT constructs, such as orientation and strength of regulatory focus, during adolescence. Finally, the study also highlights the need for a longitudinal design with short time intervals in order to more closely track change in variables of interest and further discover the relationships between regulatory focus and adolescent psychopathology.

Appendix A. MacArthur Health and Behavior Questionnaires

MacArthur Health and Behavior Questionnaire – Child Version

Depression subscale items

Child Age 13 / Time 12 13 items	Child Age 15 / Time 13 and beyond 15 items
I'm not a sad kid. I am a sad kid.	I'm not a sad <u>person</u> . I am a sad <u>person</u> .
I'm not a happy kid. I am a happy kid.	I'm not a happy <u>person</u> . I am a happy <u>person</u> .
I have fun in many things. I don't have fun in anything.	I have fun in many <u>thing</u> . I don't have fun in anything.
I feel like crying most days. I don't feel like crying most days.	I feel like crying most days. I don't feel like crying most days.
Things bother me a lot. Things don't bother me a lot.	Things bother me a lot. Things don't bother me a lot.
I don't like myself. I like myself.	I don't like myself. I like myself.
I'm a lonely kid. I'm not a lonely kid.	I'm a lonely <u>person</u> . I'm not a lonely <u>person</u> .
I have lots of energy. I don't have lots of energy.	I have lots of energy. I don't have lots of energy.
I'm not tired a lot. I'm tired a lot.	I'm not tired a lot. I'm tired a lot.
I am not as good as other kids. I am just as good as other kids.	I am not as good as other kids. I am just as good as other kids.
Nothing will ever work out for me. Things will work out for me O.K.	Nothing will ever work out for me. Things will work out for me O.K.
I don't feel too guilty. I feel too guilty.	I don't feel too guilty. I feel too guilty.
I'm not cranky. I am cranky.	I'm not cranky. I am cranky.
	I'm indecisive and unable to make up my mind. I'm not indecisive – I'm able to make up my mind.
	I have not lost interest in things that I usually enjoy. I have lost interest in things that I usually enjoy.

Children chose one statement from each pair as most like them. They then rated whether the response was “*really like me*” (scored a 6 if positive, 1 if negative); “*mostly like me*” (scored a 5 if positive, 2 if negative); or “*sort of like me*” (4 if positive, 3 if negative).

Underlining indicates word change from previous version.

MacArthur Health and Behavior Questionnaire – Child Version
Overanxious subscale items

Child Age 13 / Time 12 13 items	Child Age 15 / Time 13 and beyond 15 items
I get nervous when my teacher asks me a question. I don't get nervous when my teacher asks me a question.	I get nervous when my teacher asks me a question. I don't get nervous when my teacher asks me a question.
I feel nervous or tense most days. I don't feel nervous or tense most days.	I feel nervous or tense most days. I don't feel nervous or tense most days.
I worry about the things I've done. I don't worry about the things I've done.	I worry about the things I've done. I don't worry about the things I've done.
I don't get headaches a lot. I do get headaches a lot.	I don't get headaches a lot. I do get headaches a lot.
I don't worry bad things are going to happen. I worry bad things are going to happen.	I don't worry bad things are going to happen. I worry bad things are going to happen.
I don't get stomach-aches a lot. I do get stomach-aches a lot.	I don't get stomach-aches a lot. I do get stomach-aches a lot.
	My mind seems to go blank. My mind doesn't seem to go blank.
I don't worry a lot. I worry a lot.	I don't worry a lot. I worry a lot.
I don't have lots of bad dreams. I have lots of bad dreams.	I don't have lots of bad dreams. I have lots of bad dreams.
I am self-conscious or easily embarrassed. I am not self-conscious or easily embarrassed.	I am self-conscious or easily embarrassed. I am not self-conscious or easily embarrassed.
I have trouble sleeping. I don't have trouble sleeping.	I have trouble sleeping. I don't have trouble sleeping.
I have lots of aches or pains. I don't have lots of aches or pains.	I have lots of aches or pains. I don't have lots of aches or pains.
I feel nauseous or sick a lot. I don't feel nauseous or sick a lot.	I feel nauseous or sick a lot. I don't feel nauseous or sick a lot.
When I'm worried about something, it's hard for me to stop worrying about it. When I'm worried about something, it's not hard for me to stop worrying about it.	When I'm worried about something, it's hard for me to stop worrying about it. When I'm worries about something, it's not hard for me to stop worrying about it.
	I don't get tired or fatigued easily. I get tired or fatigued easily.

Children chose one statement from each pair as most like them. They then rated whether the response was "really like me" (scored a 6 if positive, 1 if negative); "mostly like me" (scored a 5 if positive, 2 if negative); or "sort of like me" (4 if positive, 3 if negative).

Appendix B. Regulatory Focus Questionnaire

Regulatory Focus Questionnaire – History Subscales

Please indicate how true each statement is by circling the appropriate number below it. There are no right or wrong answers, you cannot make a mistake.

- | | |
|--|--|
| <p>1. My parents kept order in our house by having a lot of rules and regulations for me.</p> <p>1 2 3 4 5
certainly certainly
false true</p> | <p>6. When I was growing up, my parents didn't seem to notice those times when I was well-behaved.</p> <p>1 2 3 4 5
certainly certainly
false true</p> |
| <p>2. When I lived at home, my parents would celebrate my important accomplishments with me.</p> <p>1 2 3 4 5
certainly certainly
false true</p> | <p>7. My parents often cautioned me about things that were not safe or that could otherwise lead to trouble.</p> <p>1 2 3 4 5
certainly certainly
false true</p> |
| <p>3. If I broke a rule, my parents would make that I heard about it.</p> <p>1 2 3 4 5
certainly certainly
false true</p> | <p>8. If I did something wrong when I was sure growing up, my parents might scold or criticize me.</p> <p>1 2 3 4 5
certainly certainly
false true</p> |
| <p>4. My parents encouraged me to try new things.</p> <p>1 2 3 4 5
certainly certainly
false true</p> | <p>9. My parents used to encourage me when I felt inadequate.</p> <p>1 2 3 4 5
certainly certainly
false true</p> |
| <p>5. My parents made sure that I knew what kind of behavior was objectionable.</p> <p>1 2 3 4 5
certainly certainly
false true</p> | <p>10. My parents felt that it was important to "set me straight" when I misbehaved.</p> <p>1 2 3 4 5
certainly certainly
false true</p> |

Appendix C. Age 13 (Grade 7): Selves Questionnaire

TIME 12 (Grade 7): SELVES INTERVIEW

NOTES RE: SELVES INTERVIEW

- 1) If child **speaks very quietly** when giving responses, you should repeat them to be sure that they can be heard on the videotape's audio track.
- 2) Simple **conversational affirmations** like "Okay," "Uh-huh," and "That's 4" are useful during the interview as the child lists descriptive words. The interviewer should **not** give responses that suggest some answers are "good," e.g., "That's a good answer" is a potentially biasing and therefore unacceptable response.
- 3) If child seems to be thinking about question but says he/she **can't think of any answers**, offer encouragement and re-ask question before giving up. (See sample for "ideal self" on page 24B.)



Begin Selves Interview by saying to the child **EXACTLY AS WORDED** (be sure to read slowly enough!):

"Now I am going to ask you to list words that describe yourself. I am also going to ask you to list words that describe the type of person you want to be and think that you ought to be. I may ask you some questions if I get confused about things along the way. If you are not sure about how to answer the question, please let me know, and I'll try to make the question clearer. Let's see if there are at least 6 things about yourself that you can tell me for each question I have.

ACTUAL SELF:

Say to the child **EXACTLY AS WORDED:**

“First I want you to list words that describe the type of person you believe you actually are now. Use adjectives or describing words, not famous people’s names. For example, if a person believes they are a little bit thoughtful and very lazy, they would say “a little bit thoughtful” and “very lazy.” Notice that you can use words like “a little bit” and “very” so that the words you use best describe you.

Now, tell me what words describe you. (Get at least 6 attributes.)

Sample prompts to use as needed:

! That’s X things – tell me Y more words that describe you.
(where X is # given and Y is number still needed)

! What are some other words that describe you?

!What are some more words that describe the type of person you believe you actually are now?

! For use only after child has given at least 6: Are there any others you can think of?

After obtaining 6 or more answers, move on to the next page as long as the child listed one or more negative attributes. However, ask the following if only positive attributes were given, or if the only negative attribute is “lazy” (with qualifier or not). Say **EXACTLY AS WORDED:**

You’ve told me some nice things about you. Are there any not so nice things about you too?

IDEAL SELF:

Say to the child EXACTLY AS WORDED:

“Now, I want you to list words that describe the type of person you would ideally like to be. That is, I would like to know what type of person you wish, desire, or hope to be.

What words describe who you would ideally like to be? (Get at least 6 attributes.)

Sample prompts to use as needed:

! That’s X things – tell me Y more words that describe who you would ideally like to be. (where X is # given and Y is number still needed)

! What are some other words that describe who you would ideally like to be?

! What are some more words that describe the type of person you wish, desire, or hope to be?

! For use only after child has given at least 6: Are there any others you can think of?

- ▼ If child says, **“There’s nothing I need to change about myself,”** say:

This question isn’t about changing – we just want you to describe the kind of person you would ideally like to be. If some of that is like the person you actually are, that’s fine. We’d still like you list at least 6 words that describe who you would ideally like to be.

- ▼ If child says, **“I’m okay with how I am”** or **“The same as the last one,”** say:

It’s okay if what you say for this question includes some of the things that you said before about the kind of person you actually are – we’d still like you list at least 6 words that describe who you would ideally like to be.

- ▼ If child says, **“I can’t think of any,”** say:

Well, I know these questions can be kind of hard, and I can see that you’re really trying to think about this. We’d like to see if you can come up with at least a few answers here, so let me read the question again for you. We’d like you to list words that describe the type of person you would ideally like to be. So, what are some words that describe the type of person you wish, desire, or hope to be.

After obtaining 6 or more answers, move on to the next question.

OUGHT SELF:

Say to the child **EXACTLY AS WORDED:**

Now I want you to list words that describe the type of person you think that you ought to be. That is, I would like to know what type of person you believe it is your duty or responsibility to be.

What words describe who you think you ought to be? (Get at least 6 attributes.)

Sample prompts to use as needed:

! That's X things – tell me Y more words that describe who you think you ought to be. (where X is # given and Y is number still needed)

! What are some other words that describe who you think you ought to be?

!What are some more words that describe the type of person you believe it is your duty or responsibility to be?

! For use only after child has given at least 6: Are there any others you can think of?

After obtaining 6 or more answers, conclude Selves Interview by thanking child for answering those questions.

Appendix D. Selves Questionnaire – Adolescent Version

Selves Questionnaire – Adolescent Version

ID# _____

You won't need to fill anything out for the next activity. Instead, I'll be asking you some questions and writing down your answers as we go. First I am going to ask you to describe the type of person you **want to be** in different situations. I am looking for the type of person that you would be **pleased and happy** to be.

A. Picture yourself **at school**. What are **three** qualities that describe the type of person you **want to be at school**?

- A1) _____
- A2) _____
- A3) _____

(And) what is one quality that describes the type of person you **do not want to be at school**?

- A4) _____

B. Now picture yourself **at home**. What are **three** qualities that describe the type of person you **want to be at home**?

- B1) _____
- B2) _____
- B3) _____

(And) what is one quality that describes the type of person you **do not want to be at home**?

- B4) _____

C. Now picture yourself **with your friends**. What are **three** qualities that describe the type of person you **want to be with friends**?

- C1) _____
- C2) _____
- C3) _____

(And) what is one quality that describes the type of person you **do not want to be with friends**?

- C4) _____

D. Now think about all three of these areas. Which one is **most** important to you – the type of person you **want to be at school, at home, or with friends**? (CIRCLE ONE)

1. At school 2. At home 3. With friends

(BEFORE ASKING Q.F BELOW, ASK Q.E IN RIGHT COLUMN)

E. Now open **Packet #12**. Using the 1-to-7 rating scale, tell me to what extent you think you **actually are** these things. (READ EACH ANSWER BACK TO IC AND RECORD SCORE BELOW.)

At school, to what extent are you **actually**: (REPEAT AS NEEDED)

- _____ A1 rating
- _____ A2 rating
- _____ A3 rating

- _____ A4 rating

At home, to what extent are you **actually**: (REPEAT AS NEEDED)

- _____ B1 rating
- _____ B2 rating
- _____ B3 rating

- _____ B4 rating

With friends, to what extent are you **actually**: (REPEAT AS NEEDED)

- _____ C1 rating
- _____ C2 rating
- _____ C3 rating

- _____ C4 rating

(ASK Q.F BELOW BEFORE PROCEEDING TO NEXT PAGE)

F. Still using the 1-to-7 rating scale, how **successful** do you think you will be **in the future** in achieving the qualities you **want to be** ... (RECORD #)

- F1) **at school**: _____ F2) **at home**: _____ F3) **with friends**: _____

We won't use the rating scale for a little while. Now I am going to ask you to describe the type of person you **should be** in different situations. I am looking for the type of person that you think it is your obligation or responsibility to be.

A. Picture yourself at school. What are three qualities that describe the type of person you **should be at school**?

A1) _____

A2) _____

A3) _____

(And) what is one quality that describes the type of person you **should not be at school**?

A4) _____

B. Now picture yourself at home. What are three qualities that describe the type of person you **should be at home**?

B1) _____

B2) _____

B3) _____

(And) what is one quality that describes the type of person you **should not be at home**?

B4) _____

C. Now picture yourself with your friends. What are three qualities that describe the type of person you **should be with friends**?

C1) _____

C2) _____

C3) _____

(And) what is one quality that describes the type of person you **should not be with friends**?

C4) _____

D. Now think about all three of these areas. Which one is most important to you – the type of person you **should be at school, at home, or with friends**? (CIRCLE ONE)

1. At school 2. At home 3. With friends

(BEFORE ASKING Q.F BELOW, ASK Q.E IN RIGHT COLUMN)

E. Using the 1-to-7 rating scale again, tell me to what extent you think you **actually are** these things. (READ EACH ANSWER BACK TO IC AND RECORD SCORE BELOW.)

At school, to what extent are you **actually**:
(REPEAT AS NEEDED)

_____ A1 rating

_____ A2 rating

_____ A3 rating

_____ A4 rating

At home, to what extent are you **actually**:
(REPEAT AS NEEDED)

_____ B1 rating

_____ B2 rating

_____ B3 rating

_____ B4 rating

With friends, to what extent are you **actually**:
(REPEAT AS NEEDED)

_____ C1 rating

_____ C2 rating

_____ C3 rating

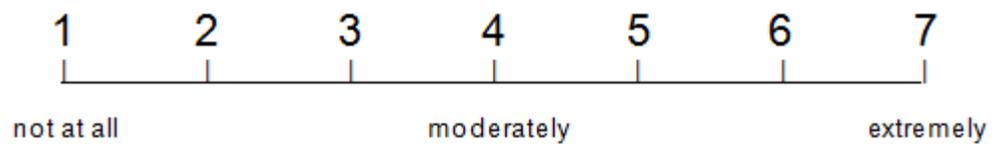
_____ C4 rating

(FINISH BY ASKING Q.F BELOW)

F. Still using the 1-to-7 rating scale, how **successful** do you think you will be in the future in achieving the qualities you **should be** . . . (RECORD #)

F1) at school: _____ F2) at home: _____ F3) with friends: _____

Rating Scale:



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Biography

Megan McCrudden Klenk was born Megan Clark McCrudden on June 7, 1974, in Princeton, NJ. She received her Bachelor of Arts degree from Brown University in 1998. She went on to receive her Master of Arts in 2002 from the Teacher's College at Columbia University. In 2008, in preparation for her doctoral work, she received her Master of Arts in Clinical Psychology from Duke. While at Duke, Megan was an NIMH Institutional Predoctoral Training Grant (T32) Fellow from 2006-2009. She was also awarded a James B. Duke Fellowship, a James B. Duke 100th Anniversary Fund Fellowship, and two Vertical Integration Program Summer Fellowships. Megan was selected to serve as Clinic Co-Coordinator for the Duke Psychology Training Clinic from 2008-2010. Her publications include:

Strauman, T. J., Klenk, M. M., & Eddington, K. M. (in press). Self-regulation as a mediator of change in psychotherapy. In Hermans, D., Rimé, B., & Mesquita, B. (Eds.), *Changing Emotions*. London, UK: Psychology Press.

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