On the origins of chronic regulatory focus: The role of socioeconomic status

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Abstract

Higgins' Regulatory Focus Theory hypothesizes that chronic regulatory focus develops from caretaker-child interactions. Consistent with this theory, previous studies have found that parenting style during childhood predicts whether one later develops promotion focus (eager strategies to achieve success) or prevention focus (vigilant strategies to avoid failure). The present study revises this hypothesis to assess the impact of broader environmental factors by examining the influence of childhood socioeconomic status (SES) on the development of chronic regulatory focus. In a correlational study, low SES was associated with authoritarian (punitive) parenting style, which was in turn correlated with prevention focus. High SES during childhood was associated with authoritative (nurturing) parenting style, which was correlated with promotion focus. Although the study failed to find a direct effect of SES on regulatory focus in our mediation model, we suggest that the present study is limited by its design. The question of whether environmental factors beyond parenting are significant predictors of regulatory focus merits further research.

Keywords: regulatory focus theory, socioeconomic status, parenting style

On the origins of regulatory focus: The role of socioeconomic status

> "You have to be hard and strict," a parent urged the [charter school] principal. "You can't be soft, because you know how these kids are."
>
> – from "How strict is too strict? The backlash against no-excuses discipline in high school" by Sarah Carr, *The Atlantic Monthly*

Over recent decades, psychological theories of motivation have developed from simple explanations for *why* we are motivated to complex theories of *how* we are motivated (Higgins, 1997). The latter question is becoming increasingly relevant to current debates in education reform. Growing support for the "No Excuses" disciplinary approach at many charter schools, most often adopted in low-income communities, raises the question of whether some students need a different kind of education or behavioral discipline to succeed (Thernstrom & Thernstrom, 2003; Buckley & Schneider, 2005; Angrist et al., 2010; Abdulkadiroglu et al., 2011). Underlying this question is a tacit assumption that low-income students are somehow differentially motivated than their peers from wealthier family backgrounds. The present study examines the veracity of this claim by assessing the relationship between socioeconomic status (SES) and motivational style.

According to Regulatory Focus Theory, our motivation style is defined by the different strategies we employ towards our goals (Higgins, 1997, 1998). To illustrate with an example: assume two students are studying for an exam with the goal of scoring an A grade. Student A attends office hours and completes the extra readings, excited by the opportunity to improve her grade in the course. Student B avoids distractions and chooses to study instead of hanging out

with friends, driven to maintain a good GPA. Higgins' regulatory focus theory characterizes Student A as having *promotion focus* and Student B as having *prevention focus* towards the same desired end goal (Higgins, 1997). More precisely, student A is concerned with growth and nurturance, towards aligning the actual self with the *ideal* self, while student B is concerned with security and responsibility, towards aligning the actual self with the *ought* self (Higgins, 1998). Thus, promotion and prevention focus describe two motivational approaches towards the same goal.

The present study adopts Higgins' *regulatory focus theory* as the basis for understanding motivational style (Higgins, 1997). Chronic regulatory focus – whether we are predominantly motivated to approach success or avoid failure in achieving our goals – is hypothesized to develop during childhood as a function of our interactions with caretakers (Higgins, 1997; Higgins & Silberman, 1998). Subsequent research offers empirical evidence to support a link between parenting style and later development of either chronic promotion or prevention focus (Higgins et al., 1998; Manian et al., 1998; Manian, 2006; Keller, 2008).

At the same time, the sociological literature on child development suggests that there is a strong association between family socioeconomic status and parenting style (Lareau, 2003; Cheadle & Amato, 2010). Lower SES parents tend to adopt an authoritarian (rejecting, punitive) parenting style, which is associated with prevention focus. Higher SES parents tend to adopt an authoritative (warm, nurturing) parenting style, which is associated with promotion focus. In addition to predicting parenting behaviors, socioeconomic status also predicts psychological aspects of child development, including cognitive, behavioral, and socio-emotional outcomes (Bradley & Corwyn, 2002; Bornstein & Bradley, 2003). The broad impact of socioeconomic status on both parenting style and child development suggests that the SES construct may

incorporate more environmental factors that predict later behavioral outcomes than parenting style alone, potentially providing a more robust explanation for the origins of regulatory focus.

Socioeconomic status not only influences parenting style, but also the resource constraints and environmental factors that influence child development (Bradley & Corwyn, 2002). The present study extends the previous hypothesis of the origins of regulatory focus beyond parenting style alone by examining the role of socioeconomic status. In the following sections, this paper offers a review of regulatory focus theory and relevant literature, before describing the research design and reporting results of a single experiment.

Overview of Regulatory Focus Theory

For most of history, theories of motivation were built upon the *hedonic principle*: we approach pleasure and avoid pain in order to maximize desirable outcomes (Higgins, 1998). To reach these goals, we are attracted to situations that bring positive outcomes and repelled from situations that yield negative outcomes. However, this simple model of human motivation fails to explain the nuanced strategies we adopt towards our goals, which go beyond a simple dichotomy of approaching good and avoiding bad (Higgins, 1997). Towards the same positive outcome, for example, one could be equally motivated either by a desire to achieve success or a fear of failure.

Regulatory focus theory provides an explanation for why both approach and avoidance strategies could lead to the same end goal (Higgins, 1997). The theory proposes two distinct goal orientations: promotion focus and prevention focus. Promotion focus corresponds to advancement, growth, and accomplishment concerns, while prevention focus corresponds to safety, security, and responsibility concerns (Crowe & Higgins, 1997). Individuals with promotion focus are motivated to achieve success, while individuals with prevention focus are

motivated to avoid failure. These two reference points – gains or losses – characterize promotion and prevention focus, respectively (Higgins, 1998). Regulatory focus theory also describes how each reference point corresponds to different strategies towards achieving the same goal: individuals with promotion focus adopt approach strategies, while individuals with prevention focus adopt avoidance strategies (Higgins et al., 1994).

Regulatory focus also influences how we think and act in everyday life: promotion and prevention focus are associated with different ways of seeing the world (Higgins et al., 1994; Lockwood et al., 2002), accomplishing tasks (Förster et al., 1998), and making decisions (Crowe & Higgins, 1997). The real-life applications of regulatory focus theory are broad, impacting outcomes ranging from how we interpret motivational messages (Sasaki & Hayashi, 2014), engage in various consumer behaviors (Pham & Higgins, 2005), take risks (Hamstra et al., 2011), and exhibit creativity (Baas et al., 2011). In the decades since Higgins first proposed regulatory focus theory, the concept has been used to understand mechanisms leading to various health, education, and behavioral outcomes across disparate fields (Higgins, 2015). However, only a small body of empirical evidence exists to explain the developmental origins of regulatory focus, which remains the focus of the present study.

The origins of regulatory focus: The caretaker-child interactions hypothesis

This paper aims to explore the origins of chronic regulatory focus: why some people orient to promotion focus while others orient to prevention focus in their motivational style. The prevailing hypothesis by Higgins (1997, 1998) proposes that the nature of the caretaker-child interactions experienced during childhood will determine whether one later adopts a promotion or prevention focus. The scope of our study is limited to chronic regulatory focus – that is, the

degree to which one holds lifelong tendencies towards either promotion or prevention focus.[1] Below, we describe the Higgins' caretaker-child hypothesis before presenting an expanded hypothesis for the origins of regulatory focus that forms the basis of the present study.

In their theory on the development of regulatory focus, Higgins and Silberman (1998) define two modes of caretaker-child interactions that correspond to the development of promotion and prevention focus. Parents who engage their children with a *bolstering* mode, such as praising good behavior, generate a promotion focus, while parents who engage their children with a *prudence* mode, such as telling children to mind their manners, generate a prevention focus. The theory proposes that parents transmit self-regulatory knowledge to the child, i.e. expectations of how one should interact with their environment, which informs the development of either promotion or prevention focus (Higgins & Silberman, 1998). Through these caretaker-child interactions, children develop knowledge about their relation to the world, which fosters distinct strategies to fit with either the promotion or prevention motivational system.

Subsequent empirical studies have generally supported Higgins' hypothesis that the nature of caretaker-child interaction is key to the development of regulatory focus. Manian and colleagues (1998, 2006) first operationalized caretaker-child interaction using measures of parenting style, establishing an association between parenting style and later chronic regulatory focus. In one study, Manian et al. (1998) examined the respective contributions of environmental (parenting style) and psychological (child temperament) factors towards the development of

[1] Excluded from this discussion is experimentally-induced, or situational, regulatory focus. As promotion focus and prevention focus are two separate and independent self-regulatory orientations, an individual's momentary tendency towards promotion or prevention focus depends on both personality and immediate context. The focus of the present study is chronic regulatory focus, which is determined by childhood environmental factors and individual personality.

regulatory focus. Warm and nurturing parenting, as well as positive temperament, were correlated with higher promotion focus scores. Rejecting and punitive parenting style, as well as negative temperament, were correlated with higher prevention focus scores. These findings suggest that environmental factors interact with innate psychological factors in the development of regulatory focus.

Keller (2008) conducted a correlational study of parenting style and regulatory focus. The experiment used a measure of parenting style based on Baumrind's (1971) tri-partite model, which includes independently measured *authoritarian*, *permissive*, and *authoritative* parenting styles. The *authoritarian* parent provides strict rules for behavior and discourages independence through parental control and punishment. Authoritarian parenting is hypothesized to correlate with prevention focus. The *permissive* parent imposes little to no demands and remains unresponsive to the child's impulses. Keller (2008) finds that the permissive parenting style yields minimal influence on the child's regulatory focus and excludes this dimension from the analysis. Lastly, the *authoritative* parent, often considered the Western ideal, rationalizes parenting actions and solicits child input (Steinberg, 1990). Authoritative parenting is hypothesized to contribute to the development of promotion focus.

The Baumrind (1971) tri-partite model of parenting styles has been widely adopted in research on parenting, and captures the many dimensions of control and nurturance that differentiate between Higgins' conception of *bolstering* and *prudence* in caretaker-child interactions (Higgins & Silberman, 1998). Keller (2008) finds significant correlations between *authoritarian* parenting and prevention focus, as well as between *authoritative* parenting and promotion focus. Although the study was correlational, these results strongly support Higgins' hypothesis. For the remainder of this paper, the theoretical modes of caretaker-child interaction

are operationalized as the corresponding parenting styles for the sake of consistency: *authoritative* parenting encompasses Higgins' *bolstering* mode, while *authoritarian* parenting encompasses Higgins' *prudence* mode.

To date, a small body of empirical research supports Higgins' hypothesis that parent-child interactions are instrumental to the development of chronic regulatory focus. The literature suggests that authoritative parenting is associated with promotion focus, while authoritarian parenting is associated with prevention focus. However, we propose that parenting style alone cannot capture the robust environmental and psychological factors that forge the development of chronic regulatory focus. Below, we turn to examine whether socioeconomic status can inform both parenting style and regulatory focus.

Socioeconomic status and parenting: Broader explanations for the origins of regulatory focus

There is a substantial body of literature describing the role of socioeconomic status in child development. Childhood socioeconomic status affects later developmental outcomes in a range of domains, including health, cognitive, and socio-emotional outcomes (Bradley & Corwyn, 2002; Bornstein & Bradley, 2003). Little is known, however, about the psychological mechanisms through which SES influences personality and behavioral tendencies. The present hypothesis proposes that regulatory focus is one such mechanism: SES is associated with parenting style, which in turn influences regulatory focus, which goes on to predict behavioral outcomes that are known to be associated with SES. Our study examines one portion of this posited pathway, assessing whether there is an association between childhood SES and later chronic regulatory focus, and if so, whether parenting style mediates this relationship. In doing so, we aim to bridge (1) the sociological literature on socioeconomic disparities in parenting

style and (2) the psychological literature on the origins and implications of regulatory focus theory.

Much of the sociological literature relating SES to child outcomes focuses on the role of parenting. Annette Lareau's (2003) *Unequal Childhoods* is a landmark qualitative study of the relationship between social class and parenting approaches. Through fieldwork observing family interactions, Lareau finds that poor and working class parents are more likely to exhibit *authoritarian* parenting style, while middle and upper class parents are more likely to exhibit *authoritative* parenting style. These findings have been corroborated in quantitative studies, which support the claim that lower childhood SES is correlated with authoritarian parenting style, and higher childhood SES is correlated with authoritative parenting style (Cheadle & Amato, 2010). As Lareau (2003) argues, the environmental factors encompassed in measures of socioeconomic status are the strongest predictors of parenting style, even when controlling for race, ethnicity, and other demographic characteristics.

At the same time, the far-reaching effects of socioeconomic status also match some of those predicted by chronic regulatory focus. Research on the influence of resource constraints during childhood suggest that having low socioeconomic status, compared to high socioeconomic status, is associated with more conservative risk-taking, spending, and time-discounting behaviors (Haushofer & Fehr, 2014). Incidentally, these same patterns of behavior can be predicted by chronic prevention focus, as compared to promotion focus (Crowe & Higgins, 1997; Pennington & Roese, 2003; Hamstra et al., 2011). Taken together, the overlapping behavioral consequences of childhood SES and regulatory focus suggest that there may be some direct association between socioeconomic status and chronic regulatory focus, independent of any mediating effects of parenting style.

Broadly, the impact of childhood poverty on development can be characterized as cumulative environmental risk exposure that significantly impacts a child's self-regulation, towards the concerns of safety and security that characterize prevention focus (Evans, 2004). The literature on childhood poverty further suggests that the environmental factors such as social and material resource constraints have substantial impacts on child development, including both self-regulation and behavioral outcomes (Bradley & Corwyn, 2002). Poverty have been shown to result in ego depletion, a phenomenon that occurs when repeated high-stakes decisions, common to families living in poverty, deplete behavioral control (Baumeister et al., 1998). Empirical studies demonstrating ego depletion and lower levels of self-control in low SES environments have helped to debunk the folk myth of the "undeserving poor," offering evidence that poverty actually causes the behaviors and tendencies towards reduced self-control that are often framed as intentionally myopic (Spears, 2011). Insofar as the research on poverty and ego depletion is grounded in theories of self-regulation, these findings support the proposed hypothesis that socioeconomic status predicts self-regulatory orientation, operationalized as chronic regulatory focus (Baumeister & Vohs, 2007). Other studies on childhood SES find significant associations between SES and various concepts related to self-regulatory processes, including effortful control (Lengua et al., 2013), delayed gratification behavior (Evans & Kimberly, 2002), stigmatized identity (Johnson et al., 2011), and chronic cumulative stressors (Evans & Kim, 2013). Together, this body of literature forms the basis for our proposal to extend the hypothesized origins of regulatory focus from parenting style alone to socioeconomic status, which encompasses a multitude of environmental factors and processes central to child development.

We hypothesize that SES has a direct relationship with chronic regulatory focus, independent of any indirect effects through parenting style. In other words, there is a direct relationship between socioeconomic status and chronic regulatory focus. The literature on SES and child development offers many proposed mechanisms to explain how SES influences the aforementioned socioemotional, cognitive, and behavioral outcomes. While parenting style is one mechanism through which SES affects the development of self-regulatory focus, it seems likely that broader environmental factors including resource availability, environmental risk factors, material deprivation, and peer interactions also play a significant role (Bornstein & Bradley, 2002; Bornstein & Bradley, 2003). As these aspects of socioeconomic status also influence parenting behaviors, it is plausible that the childhood SES can predict both the parenting style experienced during childhood and the chronic regulatory focus developed later in life. The broader environmental factors discussed above are more readily captured by metrics of socioeconomic status than the measures of parenting behavior utilized in assessments of previous hypotheses. The present study assesses whether there is an association between childhood SES and chronic regulatory focus, and if so, whether parenting style significantly mediates this relationship.

Overview of the present research

Given the established theoretical and empirical associations between socioeconomic status and parenting style, as well as between parenting style and regulatory focus, it is plausible that parenting style might mediate any relationships between socioeconomic status and chronic regulatory focus. Accordingly, the present study employs a correlational design with subsequent mediation analysis. In the single experiment conducted on Amazon's Mechanical Turk platform,

three variables are measured: recalled childhood socioeconomic status, recalled parenting style, and regulatory focus.

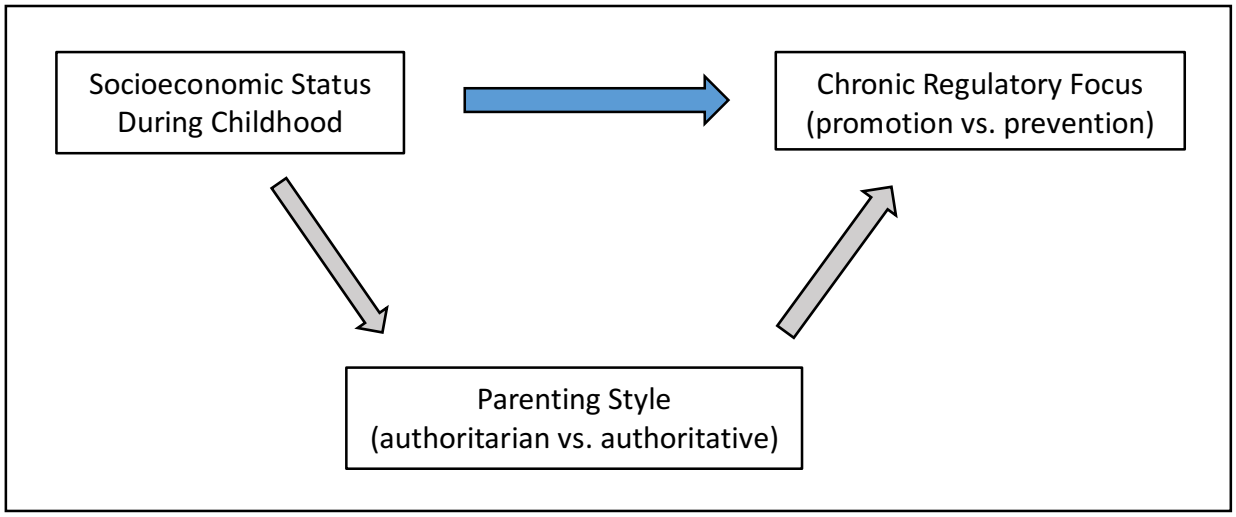


Fig. 1. The effect of childhood socioeconomic status on regulator focus via parenting style

We are interested in exploring the relationship between childhood socioeconomic status and regulatory focus, and assessing the direct and indirect effects of SES on regulatory focus via parenting style (Fig. 1). Based on the past research reviewed above, we predict that individuals with higher childhood socioeconomic status will be more likely to experience authoritative parenting, which in turn predicts higher promotion focus. Participants reporting lower SES backgrounds are predicted to be more likely to report authoritarian parenting, which in turn predicts higher prevention focus. Since the development of regulatory focus is likely dependent on environmental factors outside the parent-child relationship, such as neighborhood effects, resource constraints, and peer effects, we hypothesize that childhood socioeconomic status will also have some unmediated direct effect on regulatory focus. To our knowledge, this is the first study to propose socioeconomic status as a predictor of chronic regulatory focus.

Methods

Participants

We collected data from a one hundred and one adult workers (n = 101) on Amazon's Mechanical Turk (mTurk) platform participated in this study. Participation was limited to mTurk workers who live in the United States and whose work had previously been accepted in 95% of Human Intelligence Tasks (HITs). Respondents were paid at the completion of the survey task. The median and modal participant age range was 35-44. Of the participants, 42 responded as women, 57 as men, and 2 did not report gender. All participants completed a significant majority of the survey questions.

Procedure

Workers on mTurk who accepted the HIT were directed to an online questionnaire created using the Qualtrics survey software. The questionnaire consisted of three separate scales presented in the following order: (1) retrospective measure socioeconomic status during participant's childhood, (2) parenting style during participant's childhood, and (3) chronic regulatory focus. After completing these scales, participants were given a short attention check and asked to indicate their age range and gender. The three scales are included in the appendices.

Assessment of Childhood Socioeconomic Status. We measured childhood socioeconomic status using a 3-item scale created by Griskevicius et al. (2010), which measures perceived social class and relative resource constraints. This subjective scale is able to better incorporate indicators of resource constraint and material deprivation, dimensions of SES which we hypothesize to influence regulatory focus, as compared to absolute measures of SES, such as income or occupation. Although life history theory differs considerably from regulatory focus theory in its predictions of socioeconomic effects on behavior outcomes, this particular scale was

chosen for its reliability and generalizability to the context of the present study (see Appendix A for full SES measure). The three items measuring childhood SES were: (1) "My family usually enough money for things when I was growing up"; (2) I grew up in a relatively wealthy neighborhood"; (3) "I felt relatively wealthy compared to the other kids in my school." Participants were asked to rate their agreement on a 7-point scale anchored at 1 (strongly disagree) and 7 (strongly agree). The final score was calculated by averaging scores from each of the three items. A Cronbach's alpha of ($\alpha = 0.87$) indicated good internal consistency for the recalled childhood socioeconomic status scale.

Assessment of Parenting Style. We measured parenting style using a version of the parenting behavior questionnaire (PBQ) introduced by Hart et al. (1998), and more recently adapted by Coolahan et al. (2002) for use with a low SES participant pool.[2] Based on Baumrind's tri-partite model of parenting styles (1971), the three sub-scales measured the relative levels of *authoritarian*, *permissive*, and *authoritative* parenting styles experienced during childhood. We selected eight representative items for each sub-scale (24 items in total) to assess the strength of each parenting style as experienced by participants during their childhood (see Appendix B for full parenting behavior questionnaire).

Following Keller (2008), the items were adapted to induce retrospective framing that allows participants to report the recalled parenting style they had experienced as children. For example, the authoritarian subscale included items such as "My parents often scolded and criticized me." Participants were asked to rate the degree to which they agree with each statement on a 7-point scale anchored by 1 (strongly disagree) and 7 (strongly agree), after

[2] Coolahan et al. (2002) adapted the measure to remove bias towards higher SES respondents, making the language more neutral as well as culturally sensitive to their low-SES, African-American participant pool.

receiving a prompt to specifically reflect upon their own childhood experiences. Subscores for each parenting style were calculated, and all scales were reliable with Cronbach's alpha = .92 (authoritarian), .92 (permissive), and .94 (authoritative).

Assessment of Chronic Regulatory Focus. We measured chronic regulatory focus using the 18-item regulatory focus scale introduced by Lockwood, Jordan, and Kunda (2002). Unlike previous retrospective measures of regulatory focus, the Lockwood scale more directly captures the strength with which individuals currently hold attitudes towards goals that reflect either promotion and prevention focus, and serves here as an appropriate scale for chronic regulatory focus (Higgins et al., 2001).

Participants were presented with statements about their own views towards present and future goals (e.g. "I frequently imagine how I will achieve my hopes and aspirations"; "I frequently think about how I can prevent failures in my life"). The scale is comprised of two 9-item subscales measuring either promotion or prevention focus (see Appendix C for the full adapted measure). Some items that referred directly to "school" or "academic" goals were adapted to reflect "life" goals, consistent with the broad age range of the MTurk participant pool. Following Keller (2008), responses were given on a 7-point scale, indicating level of agreement with each statement, from 1 – (Not at all true of me) to 7 – (Very true of me). Sub-scores were calculated for promotion and prevention focus respectively by averaging the items in each scale. Cronbach's alpha of .94 (prevention focus) and .97 (promotion focus) demonstrate good internal reliability for the Regulatory Focus Questionnaire in the present study.

Results

Zero-order correlation analyses

The bivariate correlations reported in Table 1 largely reproduce the associations between parenting style and regulatory focus found in Keller (2008). Consistent with our predictions, authoritarian parenting was positively correlated with prevention focus ($r = .239$, $p = .016$) but negatively correlated with promotion focus ($r = -.193$, $p = .053$), while authoritative parenting showed negative association with prevention focus ($r = -.364$, $p < .001$) and positive association with promotion focus ($r = .433$, $p < .001$). In line with previous findings, permissive parenting style was not correlated with SES or either of the regulatory focus sub-scores (Keller, 2008). In the subsequent mediation analyses, permissive parenting style is excluded in order to simplify the model.

Table 1. *Zero-order correlation coefficients among socioeconomic status, parenting styles, and regulatory focus scores*

	1	2	3	4	5	6
1 Childhood Socioeconomic Status	3.53 (1.58)	–	—	—	—	—
2 Parenting Style – Authoritarian	-.199*	4.11 (1.50)	—	—	—	—
3 Parenting Style – Authoritative	.351**	-.574**	4.84 (1.43)	—	—	—
4 Parenting Style – Permissive	.126	-.155	.080	2.69 (1.27)	—	—
5 Regulatory Focus – Prevention	-.183	.239*	-.364**	.162	4.96 (2.16)	—
6 Regulatory Focus – Promotion	.150	-.193	.433**	.059	-.567**	5.99 (2.14)

Note: Mean scores in diagonal, standard deviations in parentheses.
*$p < .05$; **$p < .01$.

Consistent with previous research, significant associations were found between childhood SES and parenting style (authoritative vs. authoritarian), as well as between parenting style (authoritative vs. authoritarian) and regulatory focus (promotion vs. prevention). However, there were no significant correlations between childhood SES and the promotion and prevention scores. In the following section, we further examine the relationships between SES and the parenting style and regulatory focus scores by decomposing the continuous childhood SES variable.

When demographic variables (gender and age) were introduced to the model, the covariates had few significant associations with other variables. There was a significant correlation ($p = .058$) between age and gender: female participants tended to be older. There was also a strong correlation ($p < .001$) between gender and permissive parenting style; female participants were less likely to have experienced permissive parenting style. Since these covariates were not significantly associated with the variables of interest, we exclude age and gender from subsequent analyses.

Socioeconomic differences in mean scores of parenting style and regulatory focus

In the analyses of bivariate correlations above, the aggregate score for childhood socioeconomic status is treated as a continuous variable. In order to tease out the substantive socioeconomic effects at each end of the approximately normally distributed SES variable, we compared low and high SES groups. The cutoff was defined as one standard deviation below and above the mean reported SES ($M = 3.53$; $SD = 1.58$), respectively. Although the dichotomous recoding of the SES variable substantially reduced the total sample size for low SES ($n = 19$) and high SES ($n = 18$) groups, the split allowed us to compare participants at both ends of the SES

distribution. By excluding ambiguous participants around the mean, we are able to reduce any bias from participants around the mean, whose average composite SES score might be skewed by a single outlier.

As predicted, the SES difference was significant for authoritarian and authoritative parenting. Participants from wealthier backgrounds were more likely to report experiencing authoritative parenting, while those from lower SES backgrounds were more likely to report authoritarian parenting during childhood (Fig. 2).

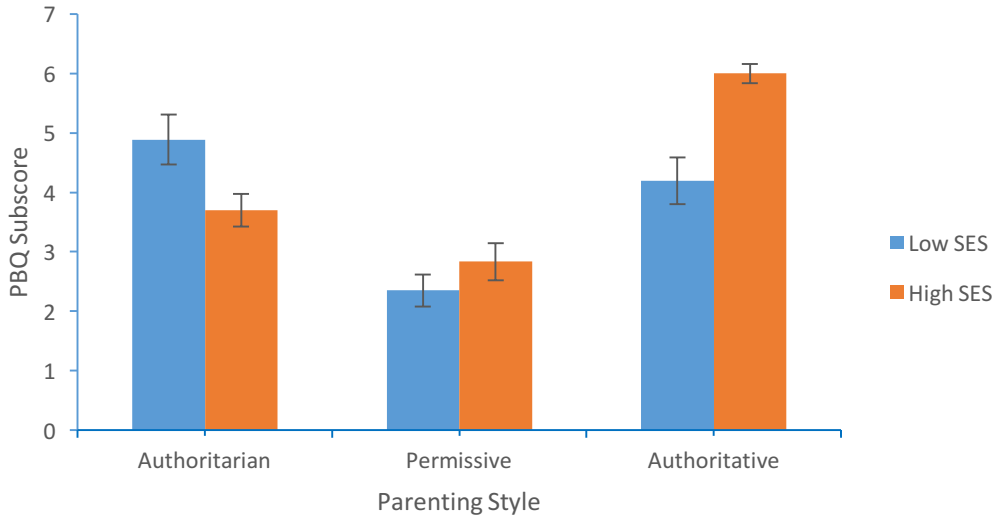


Figure 2. Socioeconomic differences in recalled parenting style

The SES differences in regulatory focus occurred in the predicted direction, but did not yield statistically significant differences (Fig. 3). An independent samples *t*-test showed that the difference in the prevention focus scores between low SES and high SES groups was marginally significant ($t(35) = 1.689$, $p = .10$). Promotion focus scores showed no significant difference ($t(35) = -1.078$, $p = .288$). However, differences in the mean promotion and prevention scores for low SES and high SES participants occurred in the predicted directions.

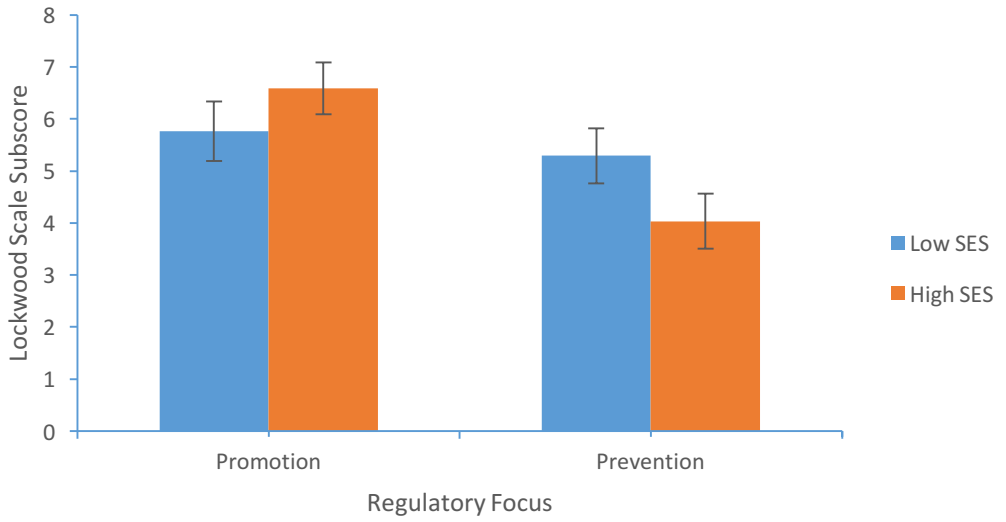


Figure 3. Socioeconomic differences in regulatory focus

Mediation Analysis

In a previous era of research, the present data would not meet the requirements for the Barron and Kenny's (1986) causal steps approach to mediation, since we fail to demonstrate a statistically significant total effect of SES (IV) on regulatory focus (DV). However, recent developments in statistical methodology suggest that in a mediation model, significant mediation effects can occur even when the regression coefficients for individual legs of the mediated pathways do not reach the criteria for statistical significance (Hayes, 2009; Rucker et al., 2011).

To examine the mediation models (see Fig. 4), we used the SPSS macro for simple mediation (PROCESS; model 4) developed by Preacher and Hayes (2004). The embedded bootstrapping procedure drew 5,000 samples from the dataset (N = 101) to estimate bias-corrected 95% confidence intervals. Both direct and indirect effects were estimated separately for models predicting promotion focus (Panel A) and prevention focus (Panel B). Indirect effects

are considered statistically significant at the .05 level if the 95% confidence interval does not include zero.

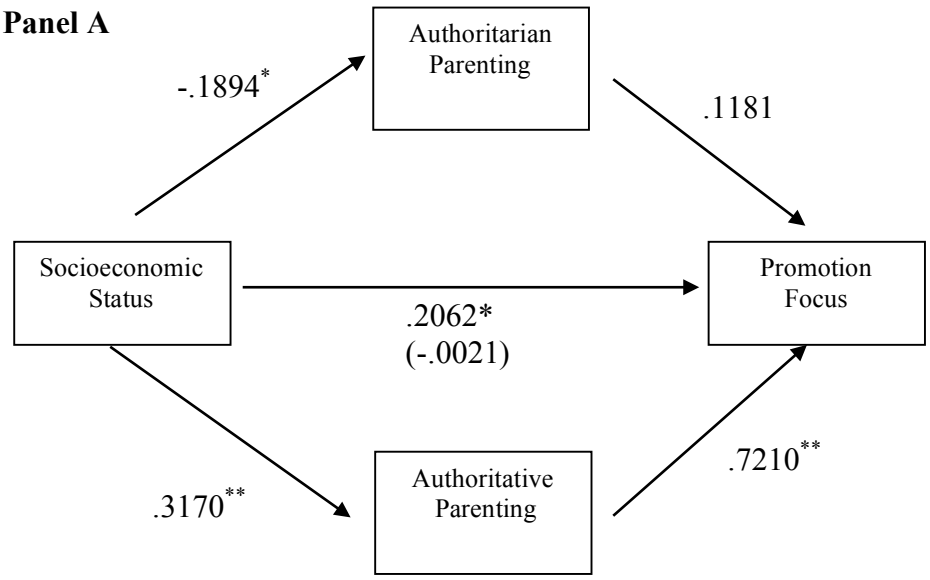
Results indicate that SES is significant predictor of authoritative and authoritarian parenting. Consistent with our previous analyses, authoritative parenting style significantly predicted promotion focus and prevention focus in the respective models. Once mediators were introduced to the model, the indirect effect of SES on regulatory focus was significant through the authoritative pathway in both the promotion focus model [β = .23, 95% CI (.11, .41)] and the prevention focus model [β = -.15, 95% CI (-.31, -.04)]. As a result, there are significant total indirect effects of SES in the promotion focus model [β = .21, 95% CI (.10, .36)] and the prevention focus model [β = -.16, 95% CI (-.33, -.06)].

In the promotion focus model, the direct effect [β = -.002, 95% CI (-.22, .22)] and total indirect effect [β = .21, 95% CI (.10, .36)] have different signs, which may indicate *inconsistent mediation.* MacKinnon et al. (2007) describe inconsistent mediation as models in which at least one mediated effect has the opposite sign of another mediated effect or the direct effect. In other words, opposing effects of mediating variables (i.e. authoritative and authoritarian parenting style) may sum to a valid null effect in the analysis. In cases where the total effect of X on Y becomes larger after including mediators, the mediating variables may act as suppressors (MacKinnon et al., 2000).

The indirect effect through authoritative parenting [β = .23, 95% CI (.11, .41)] is opposite in sign to both the indirect effect through authoritarian parenting [β = -.02, 95% CI (.11, .41)] and the direct effect [β = -.002, 95% CI (-.22, .22)]. This suggests that the effect of SES on promotion focus is suppressed when we do not account for the parenting mediators. Thus, the effect size of X on Y increases once we account for the mediators. A similar condition occurs in

the prevention focus model, where SES significantly predicts prevention focus only after accounting for a significant mediating effect through authoritative parenting.

Panel A



Panel B

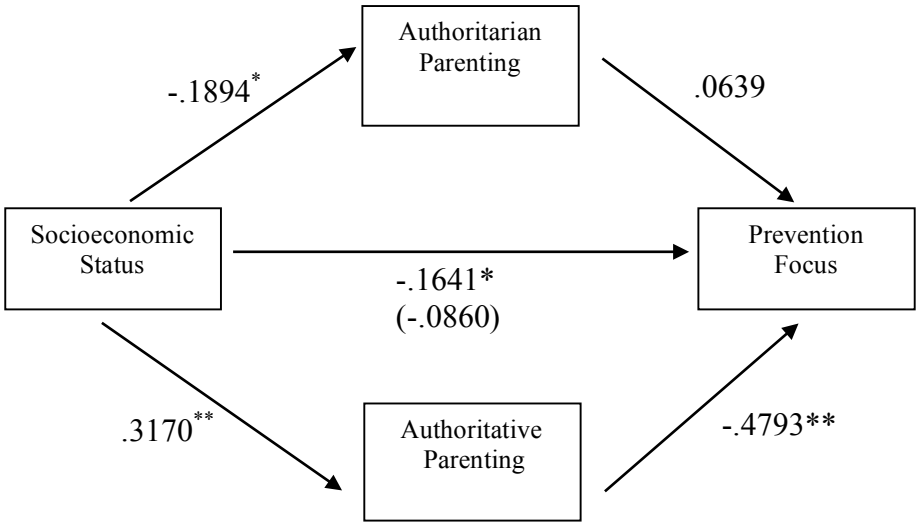


Figure 4. Results of mediation analyses testing authoritative and authoritarian parenting as mediators of the effect of socioeconomic status on promotion focus (**Panel A**) and prevention focus (**Panel B**). The significant indirect effect of X and Y is shown, and the direct effect is given in parentheses.
*$p < .05$, **$p < .01$.

Discussion

The present study is the first to examine the role of childhood socioeconomic status in the development of chronic regulatory focus. We reproduced previous findings that SES significantly predicts parenting style, which in turn significantly predicts whether one adopts promotion or prevention focus. However, analyses of the direct relationship between SES and regulatory focus were inconclusive. Results of bootstrapped mediation testing did not yield any significant direct or total effect of SES on regulatory focus, although we found significant mediated effects of SES on regulatory focus through authoritative parenting. This indicates that that authoritative parenting style at least partially mediates the relationship between SES regulatory focus. The present correlational study assessed a more robust hypothesis for the origins of regulatory focus, accounting for the broad range of environmental factors (e.g. resource availability, peer relations) that shape one's self-regulatory knowledge, extending past hypotheses that focused solely on parent-child interactions (Higgins & Silberman, 1998; Manian, 1998; Keller, 2008). Limitations of the study are presented below to contextualize the results, followed by discussion of alternative explanations and implications for future research.

Study Limitations

Although the socioeconomic differences in measures of parenting style and regulatory focus occurred in the expected direction, we failed to find a statistically significant association between SES and regulatory focus in our analyses. Limitations in the research design and statistical methodology may have prevented an accurate sampling or effective analysis, and allow us to consider how the present study could be improved to target the hypothesized direct association between childhood socioeconomic status and chronic regulatory focus.

Statistical Limitations. There are two plausible statistical explanations for the insignificant association between SES and regulatory focus. First, there was evidence for *inconsistent mediation*, which occurs when the indirect effects occur in the opposite direction from direct and total effects (MacKinnon et al., 2000). In this case, we hypothesize authoritarian versus authoritative parenting to have opposite predictions of regulatory focus. Thus, it may be consistent with our hypothesis that the opposite mediating effects of the authoritarian vs. authoritative parenting pathways negate each other, yielding null direct effects between SES and regulatory focus. Further evidence for the related *suppression* of the direct effect between SES and regulatory focus can be found in the increased effect size after including mediating variables, particularly in the promotion focus model (MacKinnon et al., 2000).[3] In other words, accounting for parenting style as a mediator actually increased the effect of SES on regulatory focus in our model. Inconsistent mediation and suppression effects occur more commonly in multiple mediation models like this one, where parallel mediating effects in opposing directions result in smaller direct and total effects variables (MacKinnon et al, 2007).

The second statistical shortcoming of this study is its small sample size, which restricts the power of our mediational analyses. In a survey of psychological literature using mediational methods, Fritz and MacKinnon (2007) found that three-quarters of the studies had not obtained the sample size necessary to achieve the standard threshold of .8 power. A simulation study conducted by the authors suggests that the parameters of this study would require a sample size of at least n = 462 to achieve adequate power. Similarly, Rucker et al. (2011) find that the probability of finding a significant total effect of X on Y increases with the sample size. Since

[3] In a typical mediation model, statistically significant mediation would accompany reduction of the magnitude of the relationship between X and Y.

low statistical power is associated with an increased likelihood of committing a Type II error (i.e. false negative claim of no statistical significance), our small sample size may have prevented us from finding a significant direct effect of childhood socioeconomic status on regulatory focus.

Low statistical power also makes it more difficult to identify small differences between two groups (Cohen, 1992; Van Voorhis & Morgan, 2007). In our comparison of means between low and high SES groups, we found larger a socioeconomic difference in the measure of authoritative than authoritarian parenting. Correspondingly, mediating effects of SES on regulatory focus were significant through authoritative parenting but not authoritarian parenting. This may suggest that low statistical power can occlude small but potentially meaningful differences in means between the low SES and high SES groups.

Research design and response bias. The small sample size may have also limited the representativeness of the participants in the study. Although the population of MTurk workers is more socioeconomically diverse than the alternative pool of college students, the distribution of participant socioeconomic status may not reflect the full range of the U.S. population to which we hope to generalize our findings (Ipeirotis, 2010; Mason & Suri, 2011). Childhood SES, the predictor variable in our study, was approximately normally distributed. In order to compare means for participants at low and high ends of the SES distribution, we greatly reduced the sample size for the analysis. A larger sample size would allow us to compare low SES and high SES groups without sacrificing statistical power.

While the scales we used to measure childhood SES, parenting style, and regulatory focus showed high internal reliability, as given by Cronbach's alpha, survey design is vulnerable to many response biases. Self-reported survey data is prone to response bias driven by social desirability (Furnham, 1986). The social desirability effect may be particularly salient in the case

of socioeconomic status, where the associations between low SES and undesirable social stigma may skew responses towards higher levels of SES, thereby reducing the observable differences between high and low SES groups. For example, a subconscious desire to be associated with indicators of higher social class may create a bias towards higher SES responses. Furthermore, the retrospective framing of the SES and parenting style measures may elicit memory bias. For example, individuals with adverse childhood experiences are likely to report false negatives (Hardt & Rutter, 2004). Taken together, the social desirability effect and response bias against adverse childhood events may offer some explanation for why socioeconomic differences were found to be substantially larger for authoritative (warm, nurturing) than authoritarian (rejecting, punitive) parenting styles.

Demographic limitations. Given our theoretical basis, we narrowed the scope of our study to socioeconomic status. Although age and gender data were collected, neither variable significantly moderated the relationship between SES and regulatory focus. Some past research has indicated that race/ethnicity is a significant predictor of parenting style (Cheadle & Amato, 2010). Future studies of the developmental origins of chronic regulatory focus should take into consideration additional demographic factors that may offset predicted socioeconomic effects.

Overall, the limitations described above offer both explanations for the inconclusive results of the analyses and constraints on the subsequent interpretation of the results. The design of our study, in particular the limited sample size and low statistical power of our analyses, increases the likelihood of Type II error (i.e. false negative result). Moreover, the correlational design precludes any strong claims about the causal influence of SES on regulatory focus. Although our results did not confirm our hypothesis of a significant direct association between

childhood SES and regulatory focus, that half of our mediated effects were statistically significant should provide enough basis for future research on the topic.

Alternative Hypotheses

Our theoretical model is rooted in previous work on regulatory focus and sociological studies of relationships between socioeconomic status and parenting. These two literatures establish associations between (1) high SES and authoritative parenting; (2) low SES and authoritarian parenting; (3) authoritative parenting and promotion focus; and (4) authoritarian parenting and prevention focus (Manian et al., 1998; Laureau, 2003; Manian et al., 2006; Keller, 2008; Cheadle & Amato, 2010). Additional evidence separately relates regulatory focus and socioeconomic status to highly similar behavioral and psychological outcomes (e.g. risk taking, time discounting), suggesting that the environmental factors constituting SES may also influence the development of regulatory focus (Pennington & Roese, 2003; Hamstra et al., 2011; Haushofer & Fehr, 2014). Broadly, our hypothesis suggests the following logic: as a result of resource constraints and accumulation of environmental risk factors, individuals from impoverished backgrounds are more likely to experience authoritarian parenting, which in turn predicts prevention focus, and consequently more risk averse, safer behaviors.

As socioeconomic status is a broad construct, different areas of research on the effects of childhood SES yield a wide range of behavioral outcomes. In evolutionary anthropology, life history theory takes childhood SES to entirely opposite conclusions, as compared to the regulatory focus theory model proposed in this paper. Life history theory contrasts “slow” (long-sighted) and “fast” (short-sighted) life history strategies. Slower life courses correspond to a slower pace of reproduction, less temporal discounting, and risk aversion; faster life courses

correspond to a faster pace of reproduction, greater temporal discounting, and more risk-taking behavior. Thus, life history theory predicts that individuals who grow up in resource-scarce environments are more likely to feel less in control and thus engage in faster allocation of resources (Griskevicius et al., 2010). Empirical findings by Griskevicius et al. (2011, 2013) indicate lower childhood SES is associated with earlier reproductive timing, greater spending during uncertain economic times, and riskier, more impulsive behavior across many domains. In contrast, our review of regulatory focus theory suggested that low childhood SES is associated with more risk averse behavior, corresponding to prevention focus, while high childhood SES is associated with risk-taking behavior, corresponding to promotion focus. Taken together, the opposing predictions of childhood SES offered by life history theory and regulatory focus theory reflect the multiple pathways through which socioeconomic status influences child development and human behavior. As we failed to account for many of these counteracting pathways in our research design, our null effect in the relationship between SES and regulatory focus may simply reflect the collapsing of multiple mechanisms through which SES influences child development. Socioeconomic status is a broad construct, and it may be prudent for future research on this topic to narrow the scope or definition of SES as it is hypothesized in relation to chronic regulatory focus.

The present study adopted the childhood SES measure created by Griskevicius et al. (2010) specifically to examine the effects of childhood SES on behavior in a life history theory context. One study utilizing this measure found that childhood SES effects of behavior are mediated by one's sense of control; individuals from lower SES backgrounds have reduced sense of control, resulting in riskier, impulsive behavior, while individuals from higher SES backgrounds have heightened sense of control, resulting in the long-term risk-averse strategies

associated with a slower life course (Mittal & Griskevicius, 2014). These results confirm predictions of life history theory that are oppose those produced by our regulatory focus-based model, offering further evidence for multiple mechanisms through which childhood SES influences later behavioral outcomes. Such mechanisms include but are not limited to parenting style, regulatory focus, and sense of control. If there are multiple mechanisms in play, the present study was able to capture only a small snapshot of the bigger picture relating SES to regulatory focus and behavioral outcomes. These counteracting effects of the multiple mechanisms by which SES influences self-regulation and behavioral outcomes could account for the insignificant direct effects we found, which nonetheless occurred in the predicted direction.

Conclusion

The present study attempts to bridge two sets of literatures. First, the research design related SES to behavioral outcomes, and regulatory focus to some of those same behavioral outcomes, ultimately proposing that socioeconomic status incorporates a broader base of environmental factors important to the development of chronic regulatory focus. Secondly, the study reproduced previously reported associations between (1) childhood SES and parenting style, and (2) parenting style and regulatory focus. The results of a mediation analysis on the effect of childhood SES on chronic regulatory focus, with parenting style as the mediating variable, did not yield any conclusive direct effects. However, statistical limitations in the design and subsequent analysis may have occluded real effects. If there are valid effects to be uncovered, a more nuanced understanding of the relationships between childhood SES, parenting style, regulatory focus, and related behavioral outcomes could offer substantial insight into one salient mechanism through which our environment affects how we think and act.

Future research should take advantage of recent advances in mediation analysis to examine the development of regulatory focus from a multi-stage perspective, moving beyond bivariate correlations to examining relationships between multiple variables. The results of this study remain inconclusive on whether or not childhood socioeconomic status plays a key role in the development of chronic regulatory focus. Regardless, the literature points us to recognize that a theory attributing the origins of regulatory focus to parent-child interaction alone is not sufficient to explain the complex processes by which we develop the promotion or prevention focus that so deeply permeate our individual ways of being, both inside and outside the classroom.

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Appendix A

Childhood Socioeconomic Status Scale (adapted from Griskevicius et al., 2010)
[Likert scale from 1 *strongly disagree* to 7 *strongly agree*]

1. My family usually had enough money for things when I was growing up.
2. I grew up in a relatively wealthy neighborhood.
3. I felt relatively wealthy compared to the other kids at my school.

Appendix B

Parenting Behavior Questionnaire (adapted)
[Likert scale from 1 *strongly disagree* to 7 *strongly agree*]

Active-Responsive

1. My parents responded to my feelings or needs.
2. My parents expressed affection by hugging and kissing me.
3. My parents explained the consequences of my behavior.
4. My parents praised me when I behaved well.
5. My parents encouraged me to think about the consequences.
6. My parents told me why I should obey rules.
7. My parents apologized to me when they made a mistake.
8. My parents encouraged me to express my opinions.

Passive-Permissive

1. My parents had a hard time saying "no" to me.
2. When I didn't do what was asked, my parents let it go or did it themselves.
3. My family says my parents spoiled me.
4. When I resisted going to bed, my parents let me stay up.
5. My parents gave in when I caused commotion.
6. My parents were unsure how to change my behavior as a child.
7. My parents threatened punishment more than they followed through.
8. My parents didn’t know what to do when I acted out in public.

Active-Restrictive

1. My parents scolded or criticized me.
2. My parents got visibly upset when I acted out.
3. My parents spanked me when I was disobedient.
4. At times, my parents used physical punishment.
5. When I misbehaved, my parents said things they regretted.
6. When we disagreed, my parents would tell me to keep quiet.
7. When I asked why I must do something, my parents would respond "I said so," or demand that I do it.
8. My parents believed that punishment is more effective than reasoning.

Appendix C

Regulatory Focus Questionnaire (adapted from Lockwood et al., 2002)
[Likert scale from 1 *not at all true of me* to 7 *very true of me*]

1. In general, I am focused on preventing negative events in my life.
2. I am anxious that I will fall short of my responsibilities and obligations.
3. I frequently imagine how I will achieve my hopes and aspirations.
4. I often think about the person I am afraid I might become in the
1. future.
5. I often think about the person I would ideally like to be in the
2. future.
6. I typically focus on the success I hope to achieve in the future.
7. I often worry that I will fail to accomplish my academic goals.
8. I often think about how I will achieve academic success.
9. I often imagine myself experiencing bad things that I fear might happen to me.
10. I frequently think about how I can prevent failures in my life.
11. I am more oriented toward preventing losses than I am toward achieving gains.
12. My major goal in school right now is to achieve my academic ambitions.
13. My major goal in school right now is to avoid becoming an academic failure.
14. I see myself as someone who is primarily striving to reach my "ideal self"—to fulfill my hopes, wishes, and aspirations.
15. I see myself as someone who is primarily striving to become the self I "ought" to be—to fulfill my duties, responsibilities, and obligations.
16. In general, I am focused on achieving positive outcomes in my life.
17. I often imagine myself experiencing good things that I hope will happen to me.
18. Overall, I am more oriented toward achieving success than preventing failure.