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EXAMINING THE PATHWAY THROUGH WHICH INTRINSIC AND EXTRINSIC ASPIRATIONS GENERATE STRESS AND SUBSEQUENT DEPRESSIVE SYMPTOMS

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The aim of the current study is to examine how greater extrinsic versus intrinsic aspirations relate to stress generation processes using a 6-month multi-wave, longitudinal design in a sample of North American adolescents ($n = 255$). Additionally, we sought to examine the cross-cultural applicability of our model in a sample of adolescents from mainland China ($n = 405$). At the initial assessment, adoles-

cents completed self-report measures assessing intrinsic and extrinsic aspirations, dependent interpersonal and noninterpersonal stress, and depressive and anxious symptoms. Follow-up assessments occurred every month for six months, and participants provided information regarding stress as well as depressive and anxious symptoms. Results of idiographic, time-lagged hierarchical linear modeling indicated that for both samples, greater relative endorsement of extrinsic as compared to intrinsic goals predicted higher levels of dependent interpersonal stress. Such stress also predicted higher levels of depressive but not anxious symptoms. Further, dependent interpersonal stress mediated the relationship between extrinsic goals (relative to intrinsic aspirations) and depressive symptoms. Additionally, while noninterpersonal stress mediated the relationship between extrinsic goals (relative to intrinsic aspirations) and depressive symptoms in Chinese adolescents, the model was not significant in the North American sample. Overall, the results suggest that, across cultures, greater endorsement of extrinsic versus intrinsic aspirations is a vulnerability factor that generates stress in individuals, which in turn increases one's susceptibility to depressive symptoms.

Goals are a critical ingredient for the effective treatment of psychopathology (Beck, 1995); however, research suggests that intrinsic and extrinsic aspirations differentially impact well-being and contribute to psychopathology (e.g., Kasser & Ryan, 1993, 1996; Niemiec, Ryan, Deci, & Williams, 2009). Intrinsically motivated goals are thought to be inherently interesting, pleasurable, and/or meaningful. Further, Deci (1975) asserts that these aspirations are pursued in order to feel both competent and self-determined. In contrast, extrinsically motivated goals are typically sought in order to attain a reward (i.e., material goods or money) or to avoid punishment (Ryan & Deci, 2000; Silverstein, 2010). Kasser and Ryan (1993) suggest that the pursuit of extrinsic goals at the exclusion of intrinsic pursuits may have particularly pernicious effects on psychological outcomes suggesting that there is value in examining extrinsic pursuits relative to intrinsic aims. Implicit within this operationalization is the assumption that extrinsic aspirations per se do not negatively impact psychological well-being. Rather, negative psychological outcomes are only hypothesized to ensue when the pursuit of extrinsic goals leads to the neglect of intrinsic aspirations. Guided by self-determination theory (Deci & Ryan, 1985), the research posits that the neglect of intrinsic goals ultimately thwarts the satisfaction of core, inherent psychological needs for relatedness, competence and autonomy, which in turn contributes to negative psychological outcomes including depressive symptoms (Kasser, 2002; Ryan,

Sheldon, Kasser, & Deci, 1996). Although a number of studies have reported a significant association between extrinsic values and negative psychosocial outcomes, the vast majority of these studies have been cross-sectional in nature, and thus are inherently limited by a temporal confound. Further, few studies have delineated the etiological pathway regarding how extrinsic beliefs may lead to depressive symptoms. Therefore the current study sought to elucidate how a relative emphasis on extrinsic as opposed to intrinsic aspirations leads to greater depressive symptoms in the context of a stress generation framework.

EXTRINSIC ASPIRATIONS AND DEPENDENT INTERPERSONAL STRESS

To date, numerous studies have indicated that the pursuit of intrinsic aspirations (i.e., self-acceptance, affiliation, and community feeling) relative to extrinsic goals (i.e., financial success, social recognition, and physical attractiveness) is associated with positive affect, greater well-being, and self-actualization (Kasser & Ryan, 1996; Schmuck, Kasser, & Ryan, 2000). Ryan and colleagues (1996) indicate that the difference between intrinsic and extrinsic goals is the degree to which such goals satisfy core psychological processes. Namely, whereas the attainment of intrinsic goals fulfills basic psychological needs and promotes psychological health, the achievement of extrinsic goals do not (Kasser & Ryan, 2001). Consequently, stronger extrinsic pursuits relative to intrinsic aspirations is associated with an array of negative psychosocial outcomes including (a) greater depressive symptoms, (b) greater use of tobacco, alcohol, and marijuana, and (c) higher incidence of precocious sexual behaviors (Kasser & Ryan, 1996; Williams, Cox, Hedberg, & Deci, 2000).

While there appears to be a relatively robust relationship between extrinsic aspirations (relative to intrinsic goals) and negative psychosocial outcomes (i.e., depressive and anxious symptoms), scant research has examined the pathway through which such aspirations lead to depressive and anxious symptoms. Stress generation may provide a theoretical and conceptual link. More specifically, the stress generation framework posits that characteristics, behaviors, or circumstances within an individual's life context contribute to the occurrence of dependent stressful events. In contrast to fateful or independent events, these events are thought to be dependent

as an individual may be partially responsible for their occurrence. Prior research indicates that these dependent events are often interpersonal in nature (e.g., Hammen, 1991). Historically, the stress generation framework has examined how a previous history of depression in adult women contributed to greater dependent interpersonal, but not independent, stressful life events and increased their susceptibility for future depressive episodes (Hammen, 1991). These results have been replicated with diagnoses of depression in children and adolescents (e.g., Harkness & Stewart, 2009; Rudolph, 2008), adult men (Cui & Vaillant, 1997), and adult women (Hammen, Shih, & Brennan, 2004). Further, the stress generation effect has been implicated in research examining depressive symptoms in youth (e.g., Hankin, Mermelstein, & Roesch, 2007; Shih, Abela, & Starrs, 2009), college students (Gibb, Beevers, Andover, & Holleran, 2006), and adults (e.g., Daley, Hammen, Davila, & Burge, 1998). More recently, researchers have begun to explore how underlying cognitive (e.g., Auerbach, Eberhart, & Abela, 2010) and interpersonal (e.g., Auerbach, Bigda-Peyton, Eberhart, Webb, & Ringo Ho, 2011) vulnerability factors contribute to the stress generation effect, however, research has not explored the role of aspirations. Consistent with the stress generation theory, we hypothesized that greater endorsement of extrinsic aspirations, relative to intrinsic goals, would lead to dependent interpersonal, but not noninterpersonal stressors, which, in turn, would contribute to the onset of depressive symptoms.

There are several reasons to suspect that extrinsic aspirations contribute to the stress generation effect described above. First, research has shown that individuals who place a premium on extrinsic goals report lower quality interpersonal relationships (Kasser & Ryan, 2001; Kasser, Ryan, Couchman, & Sheldon, 2004; Richins & Dawson, 1992; Sheldon & Flanagan, 2001). As suggested by Kasser (2002), one possible explanation for this association is that extrinsically-motivated individuals neglect interpersonal relationships, instead spending more time pursuing, consuming, and thinking about money and materialistic goods (Cohen & Cohen, 1996; Kasser & Ryan, 1993; Keng, Jung, Jivan, & Wirtz, 2000; Ryan et al., 1999; Schmuck et al., 2000). Furthermore, such individuals may have a tendency to perceive and treat others as objects or instruments rather than ends in themselves (Kasser, 2002; Khanna & Kasser, 2001). Namely, they may perceive their interpersonal relationships through the lens of a materialistic mindset, seeing others as tools

that they can exploit to further their personal extrinsic goals. In summary, these individuals may engage in behaviors that generate interpersonal discord and undermine their relationships. Second, research indicates that individuals who endorse a higher concentration of extrinsic versus intrinsic aspirations report higher levels of narcissism (e.g., interpersonal manipulativeness, vanity, defensiveness; Kasser & Ryan, 1996) and are more competitive with others (Sheldon & McGregor, 2000), findings which bolster the claim that extrinsically motivated individuals engage in behaviors deleterious to interpersonal harmony. Furthermore, Kasser, Ryan, Zax, and Sameroff (1995) found that higher levels of materialism (i.e., operationalized as greater endorsement of extrinsic goals) in adolescents were associated with lower levels of maternal warmth and nurturance. Such deficient maternal care may contribute to the formation of maladaptive internal working models in youth (Pietromonaco & Barrett, 2000), which in turn may have a negative impact on later interpersonal relationships (Kasser & Ryan, 2001). Last, individuals who pursue extrinsic goals at the expense of intrinsic aspirations are hypothesized to have a contingent, unstable sense of self-esteem (Kasser, 2002). That is, their self-worth hinges upon the attainment of external rewards (e.g., money, materialistic goods) and/or the admiration of others (e.g., due to physical appearance or social status; Kasser et al., 2004; Kasser & Ryan, 2001). Thus, when extrinsic goals are unfulfilled, many individuals experience dramatic dips in their self-esteem leading to increased stress, particularly in the interpersonal domain (Kasser et al. 2004). Taken together, these findings suggest that extrinsically-oriented individuals have a tendency to generate dependent interpersonal stress, which then may contribute to the onset of depressive symptoms.

EXAMINING STRESS GENERATION SPECIFICITY

The vast majority of past research has examined stress generation in relation to depression (for a review see Liu & Alloy, 2010). Whereas some evidence suggests that stress generation may be specific to depressive symptoms and diagnoses (e.g., Joiner, Wingate, Gencoz, & Gencoz, 2005; Rudolph et al., 2000), other studies have also reported an association between stress generation and anxious symptoms and/or disorders (e.g., Connolly, Eberhart, Hammen, & Brennan, 2010; Hankin, Kassel, & Abela, 2005; Harkness & Luther, 2001).

Such mixed results provide tacit evidence that the stress generation process may be nonspecific, and additionally, it may vary as a function of underlying vulnerability factors. To that end, Christopher, Morgan, Marek, Keller, and Drammond (2005) found that individuals who prioritize materialistic and extrinsic goals experience social discomfort and anxiety in their efforts to maintain a positive self-presentation, which suggests that extrinsic aims may trigger anxious symptoms among certain individuals. Coupled with significant comorbidity between depression and anxiety (e.g., Rohde, 2009), we hypothesize that (1) an emphasis on extrinsic as opposed to intrinsic goals will predict anxious symptoms; and (2) dependent interpersonal stressors will mediate this relationship. Further, consistent with the stress generation framework, we believe that dependent interpersonal, but not noninterpersonal stressors, will mediate the relationship between a relative importance on extrinsic goals and subsequent symptoms.

CROSS-CULTURAL APPLICABILITY: EXAMINING ADOLESCENTS FROM MAINLAND CHINA

Economic reforms initiated 30 years ago in mainland China not only facilitated a move to a modern market economy, and an increase in household incomes and greater consumer demand for goods and services (Batra, 1997), but precipitated rapid social and cultural change. For younger generations, individual goals, such as the accumulation of personal wealth, the consumption of goods as a means of self-expression, or the pursuit of personal well-being, are no longer subordinate to or in line with collective goals. These individualistic aims or extrinsic pursuits among younger generations, however, are at odds with Chinese people and institutions that continue to adhere to traditional Confucian values (Kwong, 1994). One natural consequence of this ideological conflict may be a greater occurrence of dependent interpersonal stressors as younger generations may not embrace the same aspirations as their elders and community, which may escalate relational tensions between these groups.

Additionally, a greater emphasis on extrinsic pursuits in China coincides with the escalation of emotional and behavioral problems among Chinese youth. More specifically, prevalence rates of psychopathology in China are similar to rates in North America and

Europe, and a number of large-scale epidemiological studies have reported that 10–30% of Chinese children and adolescents have mental health problems, including depression and anxiety, (Auerbach, Abela, Zhu, & Yao, 2010; Auerbach, Eberhart, & Abela, 2010; Ho et al., 2010; Liu et al., 1999; Tepper et al., 2008). Thus, a secondary goal of the current study is to examine the cross-cultural applicability of our proposed models in a sample of adolescents from mainland China. We hypothesized that greater endorsement of extrinsic as opposed to intrinsic aspirations in youth are contributing to greater ideological conflicts which have resulted in a greater occurrence of dependent interpersonal, but not noninterpersonal, stress. Such stress may then be potentiating depressive and anxious symptoms. While there are vast cultural differences between China and Canada, the applicability of the proposed model is interesting to consider given that (a) adolescence is the peak period for the occurrence of stress as well as depressive and anxious symptoms (see Hankin & Abela, 2008); (b) rates of consumerism and materialism are rising among Chinese youth (Rosen, 2003); and (c) extrinsic aspirations, stress, and depressive/anxious symptoms are strongly associated (e.g., Kasser, 2002).

GOALS OF CURRENT STUDY

In order to address theoretical and empirical gaps in previous research, the primary aim of the current study is to prospectively examine how a greater tendency to endorse extrinsic as opposed to intrinsic aspirations influences stress generation within a sample of Canadian adolescents. Specifically, we utilized an idiographic, multi-wave, longitudinal design to investigate whether increased stress generation will mediate the relationship between a relative importance on extrinsic (versus intrinsic) goals and depressive and anxious symptomology. We hypothesized that: (1) dependent interpersonal stressors$_{(Time\ T-1)}$ will mediate the relationship between a greater endorsement of extrinsic as opposed to intrinsic aspirations and elevations in depressive symptoms$_{(Time\ T)}$; and (2) dependent interpersonal stressors$_{(Time\ T-1)}$ will mediate the relationship between greater endorsement of extrinsic as opposed to intrinsic aspirations and elevations in anxious symptoms$_{(Time\ T)}$. In order to provide a stringent examination of the stress generation framework, we also hypothesized that noninterpersonal stressors would not mediate
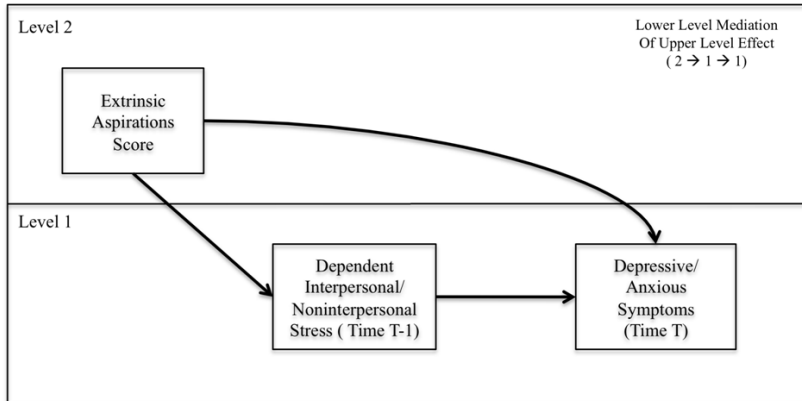
FIGURE 1. Hypothesized mediation model examining the idiographic, time-lagged relationship among extrinsic aspirations, stress, and symptoms over time.
Note. Extrinsic Aspirations Score examines extrinsic aspirations relative to intrinsic goals.

the relationship between greater endorsement of extrinsic aspirations and depressive/anxious symptoms (see Figure 1). Additionally, our secondary aim is to examine the cross-cultural applicability of our proposed models in a sample of adolescents from mainland China.

METHOD

PARTICIPANTS

Participants in the current study were recruited from high schools in Montreal, Canada, and Yue Yang, China. The Canadian sample included 255 adolescents (42.6% male and 57.4% female) between the ages of 12 and 18 (Mean = 14.48; *SD* = 1.47). The sample was 79.5% Caucasians, 8.0% Asians, 4.8% African Americans, 1.5% Hispanic, and 6.0% reported Other as their ethnicity. Participants' predominant mother tongues were English (76.2%) and French (11.8%), however, 12.0% of participants reported Other. The average rate of retention for each assessment over the follow-up period was 76%, and each participant completed at least three assessments.

Participants from mainland China were recruited from an urban high school in Yue Yang, Hunan. The final sample consisted of 405

high school students (49.8% male and 50.2% females) whose ages ranged from 14 to 19 (mean = 16.18; *SD* = 0.95). The sample was 97.1% Han and 2.9% ethnic minority. All participants reported that their mother tongue was Mandarin. The average rate of retention for each follow-up over the course of the study was 95%, and further, 88% of individuals completed the initial assessment and all six follow-up assessments.

PROCEDURE

Data for the present manuscript was collected as part of a broader multi-site study examining cognitive, interpersonal, and cultural models of depression and risky behavior engagement. McGill University's ethics board granted approval for the study, and the treatment of participants was in accordance with American Psychological Association ethical standards. Prior to the initial assessment, letters of informed consent were sent home to parents describing the aims of the project and requesting consent for their child to participate. In the present study, all students who received parental consent also gave personal consent. During the initial assessment which occurred on school grounds, students completed a demographics form and the following questionnaires: (1) Center for Epidemiologic Studies Depression Scale (Radloff, 1977), (2) Multidimensional Anxiety Scale for Children—Short Form (March, 1997), (3) Adolescent Life Event Questionnaire—Revised (Hankin & Abramson, 2002), and (4) the Aspiration Index—Revised (e.g., Kasser & Ryan, 1996; Niemiec et al., 2009). Follow-up assessments occurred every 6 weeks for Canadian adolescents (Times 2–5) and every month for Chinese adolescents (Times 2–7), and participants completed self-report measures assessing symptoms and negative events.

MEASURES

The Chinese version of all self-report measures was developed using the back-translation method. First, the original version was translated into Chinese by one bilingual translator from the psychology department at Central South University (Changsha, Hunan). Next, the Chinese version was back-translated into English by another bilingual translator from the psychology department

at McGill University. If discrepancies arose in the back-translation, translators worked cooperatively to make corrections to the Chinese version.

Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977*).* The CES-D is a 20-item self-report measure that assesses levels of depressive symptoms. Examples of questions include: "I felt sad," "I felt hopeless about the future," and "I felt lonely." Items on the scale ranged from 0 to 3 with higher scores reflecting greater depressive symptomology. While the CES-D was administered every 6 weeks, participants reported how they felt during the past week by using the following scale: rarely (<1 day), some or a little of the time (1-2 days), occasionally or a moderate amount of time (3-4 days), and most or all of the time (5-7 days). Across administrations the Cronbach's alpha ranged from .92 to .94 for Canadian adolescents and .89 to .95 for Chinese adolescents which indicates high internal consistency.

Multidimensional Anxiety Scale for Children – Short Form (MASC-SF; March, 1997*).* The MASC-SF is a 10-item measure that assesses severity of anxious symptoms in the past week. Each item consists of a statement such as "I feel restless or on edge" or "I'm afraid that other kids will make fun of me" that participants rate on a four-point Likert scale ranging from 0 (never applies to me) to 3 (often applies to me). In the present study, the Cronbach's alpha ranged from .71 to .81 for the Canadian adolescents and .73 to .87 for the Chinese adolescents across administrations, which indicates moderate to moderately high internal consistency.

Adolescent Life Events Questionnaire—Revised (ALEQ; Hankin & Abramson, 2002*).* The ALEQ is a 57-item self-report questionnaire that was developed to assess a broad range of negative life events occurring in the past month. A consensus team rated whether each item was (a) dependent (i.e., at least in part dependent on the actions of the individual); (b) interpersonal; and (c) noninterpersonal. Items that were unanimously agreed upon were retained, and items in which disagreement arose were excluded. A total of 29 items were rated as both dependent and interpersonal, and thus were included in the present analyses. Examples of items are "You fought with your parents over your personal goals, desires, or choice of friends," "A close friend did not treat you as well as he/she used to," and "You had an argument with a close friend." The consensus team also rated 13 items as noninterpersonal including "A close

family member lost their job" and "You did poorly on or failed a test or class project." Participants were asked to indicate how often such events occurred on a Likert scale ranging from 0 (never) to 4 (always) with higher scores reflecting a greater number of negative life events. In the current study, Cronbach's alphas for the 29 items rated as dependent interpersonal stressors ranged from .88 to .90 for Canadian adolescents and .91 to .94 for Chinese adolescents across administrations indicating high internal consistency. The internal consistency of nonintepersonal stressors across assessments ranged from .70 to .81 in Canadian adolescents and .75 to .88 in Chinese adolescents suggesting moderate to strong internal consistency.

Aspirations Index—Revised (AI-R; e.g., Kasser & Ryan, 1996; Niemiec et al., 2009*).* The AI-R is a 35-item self-report questionnaire, and each item utilizes the question prompt, "How important is this." Examples of questions include "To be a very wealthy person," "To have many expensive possessions," "To be famous," and "To have an image that others find appealing." Items on the scale range from 1 (not at all) to 7 (very), and higher scores reflect greater orientation toward intrinsic and extrinsic goals. Whereas intrinsic goals are comprised of the subscales self-acceptance, affiliation, and community feeling, extrinsic goals are the sum of subscales pertaining to financial success, social recognition, and appealing appearance. Past literature has utilized the AI-R to compare one's relative emphasis on extrinsic as opposed to intrinsic goals (e.g., Ryan, Sheldon, Kasser, & Deci, 1996), and in order to do so, the following steps were taken. First, the extrinsic values scale was created by summing the financial success, social recognition, and appealing appearance subscales. Second, the intrinsic values subscale was created by summing the self-acceptance, affiliation, and community feeling subscales. Last, the mean score for the extrinsic value subscales was subtracted by the mean for the total score. This created a new variable, which examined the relative endorsement of extrinsic as opposed to intrinsic aspirations. In doing so, it delineates the relative importance an individual places on extrinsic goals as it relates to both intrinsic and extrinsic aims. Past research using the AI-R has shown that the measure is reliable and possesses strong internal consistency (Kasser, 2001; Kasser & Ryan, 1996). In the present study, the Cronbach's alpha was 0.91 and 0.92 for the Canadian and Chinese adolescents, respectively, which indicates high internal consistency.

TABLE 1. Pearson Correlations, Means, Standard Deviation, and Range for Depressive Symptoms, Anxious Symptoms, Dependent Interpersonal Stress, Noninterpersonal Stress, Materialism, and Age at the Initial Assessment for Canadian Adolescents (n = 255)

Variables	Initial Depressive Symptoms	Initial Anxious Symptoms	Initial Dependent Interpersonal Stress	Initial Noninterpersonal Stress	Extrinsic Aspirations Score	Age
Initial Depressive Symptoms	—					
Initial Anxious Symptoms	.39***	—				
Initial Dependent Interpersonal Stress	.65***	.21***	—			
Initial Noninterpersonal Stress	.45***	.11	.72***	—		
Extrinsic Aspirations Score	.04	-.23***	.08	.18**	—	
Age	.17**	.26***	.16*	.15*	-.07	—
Mean	14.93	14.00	25.44	12.85	-0.66	14.28
Standard Deviation	11.50	6.42	15.67	7.12	0.67	1.52
Low	0	0	0	0	-2.67	12
High	52	37	76	34	1.03	18

Note. Extrinsic Aspirations Score examines extrinsic aspirations relative to intrinsic goals. *$p < .05$; **$p < .01$; ***$p < .001$.

OVERVIEW OF DATA ANALYTIC APPROACH

To examine our proposed mediation models, we utilized idiographic, time-lagged multilevel modeling in which individuals were nested over time and followed the guidelines proposed by Bauer, Preacher, and Gil (2006). Such an approach is ideal for examining mediation models that include repeated measures, and given that the model is estimated in a single equation, one can directly estimate the covariance of the random effects that are encompassed in different Level 1 and Level 2 models. Consequently, Bauer and colleagues' (2006) data analytic approach is preferable to mediation models that utilize a step-by-step process, which makes the implicit assumption that each of the steps is independent from one another (e.g., Baron & Kenny, 1986; Kenny, Kochmaros, & Bolger, 2003).

To examine whether dependent interpersonal stress mediated the relationship between extrinsic (relative to intrinsic) aspirations and depressive/anxious symptoms, analyses were carried out using SAS (version 9.2) mixed procedure and maximum likelihood estimation. Our dependent variable was either within-subject fluctuations in depressive or anxious symptoms, which is a Level 1 variable. The primary predictor of depressive or anxious symptoms was extrinsic (relative to intrinsic) aspirations, a between-subject and Level 2 variable, and the mediator was within-subject fluctuations of dependent interpersonal/noninterpersonal stress, a Level 1 variable. The 95% confidence interval (CI) of the mediation effect on dependent interpersonal/noninterpersonal stress is computed following the formula presented in Bauer et al. (2006). The mediation effect is considered statistically significant if 0 is not included in the CI. Six additional effects were also included in this initial mean structure. First, in order to control for individual differences in baseline levels of depressive or anxious symptoms, participant's initial depressive or anxious symptoms was included in the model. Second, we controlled for initial levels of dependent interpersonal/noninterpersonal stress when predicting changes of symptoms over time. Third, in order to provide a more conservative examination of our hypotheses, as well as controlling for the known comorbidity between anxiety and depression, we controlled for anxious symptoms throughout the follow-up period when predicting depressive symptoms. Conversely, when estimating models for anxious symptoms, we controlled for depressive symptoms throughout the

TABLE 2. Pearson Correlations, Means, Standard Deviation, and Range for Depressive Symptoms, Anxious Symptoms, Dependent Interpersonal Stress, Noninterpersonal Stress, Materialism, and Age at the Initial Assessment for Chinese Adolescents (n = 405)

Variables	Initial Depressive Symptoms	Initial Anxious Symptoms	Initial Dependent InterpersonalStress	Initial Noninterpersonal Stress	Relative Extrinsic Belief Scores	Age
Initial Depressive Symptoms	—					
Initial Anxious Symptoms	.54***	—				
Initial Dependent Interpersonal Stress	.56***	.42***	—			
Initial Noninterpersonal Stress	.49***	.42***	.69***	—		
Extrinsic Aspirations Score	.15***	.07	.27***	.20***	—	
Age	.20***	.17***	.14**	.10	-.002	—
Mean	12.16	11.19	53.86	14.41	-0.51	16.18
Standard Deviation	8.84	5.14	13.27	6.05	0.53	0.95
Low	0	0	0	0	-2.00	14
High	44	24	77	34	1.73	19

Note. Extrinsic Aspirations Score examines extrinsic aspirations relative to intrinsic goals. * $p < .05$; ** $p < .01$; *** $p < .001$.

course of the study. Fourth, in order to account for individual variability in the average level of depressive or anxious symptoms at his or her mean level of dependent interpersonal stress a random effect for intercept was included in the model. Fifth, given that dependent interpersonal stress is a within-subject predictor whose effect is expected to vary from participant to participant, a random effect for slope was included in the model. Last, preliminary analyses indicated that none of the reported associations were moderated by either age or gender, and thus, analyses are presented for the entire sample as a whole. Nevertheless, both age and gender were utilized as covariates in all multilevel analyses.

RESULTS

DESCRIPTIVE DATA

Means, standard deviations, and intercorrelations between all Time 1 measures are included in Table 1 for Canadian adolescents and Table 2 for Chinese adolescents. Additionally, descriptive statistics for depressive and anxious symptoms during the follow-up period are presented in Table 3.

DEPRESSIVE SYMPTOMS AMONG CANADIAN
ADOLESCENTS: IDIOGRAPHIC, TIME-LAGGED MEDIATION
MODEL

Multilevel modeling analyses were conducted to examine whether higher levels of relative extrinsic aspirations predicted fluctuations in depressive symptoms over the follow-up period (i.e., the main effect model). The model utilized an autoregressive covariance structure and a random intercept. Results indicated that higher levels of relative extrinsic aspirations predicted higher levels of depressive symptoms, $b = 0.73$, SE = 0.33, $t(241) = 2.17$, $p < 0.05$. As the main effect model was significant, the full mediation model was examined.

When examining the covariance structure, the best fit was first-order autoregressive. After choosing the covariance structure, we next examined the random effects component of our model. The random intercept was not significant and thus, deleted prior to re-

TABLE 3. Means, Standard Deviations, and Range for Depressive and Anxious Symptoms during the Follow-Up Period

	Canadian Adolescents				Chinese Adolescents			
Depressive Symptoms	**Mean**	**Standard Deviation**	**Low**	**High**	**Mean**	**Standard Deviation**	**Low**	**High**
Follow-Up #1	14.06	11.00	0	52	12.36	9.22	0	51
Follow-Up #2	13.70	11.71	0	53	12.02	9.53	0	51
Follow-Up #3	11.96	10.77	0	60	11.35	9.70	0	56
Follow-Up #4	13.34	10.82	0	46	10.32	9.99	0	58
Follow-Up #5	—	—	—	—	8.96	9.10	0	51
Follow-Up #6	—	—	—	—	10.00	9.56	0	54
Anxious Symptoms								
Follow-Up #1	15.31	6.45	0	37	10.05	5.37	0	24
Follow-Up #2	14.31	6.99	0	36	9.07	5.64	0	25
Follow-Up #3	13.60	6.92	0	32	7.99	5.66	0	26
Follow-Up #4	13.53	7.38	0	32	7.24	5.70	0	27
Follow-Up #5	—	—	—	—	6.42	5.72	0	25
Follow-Up #6	—	—	—	—	6.88	5.87	0	25

Note. Depressive Symptoms = Center for Epidemiologic Studies Depression Scale (Radloff, 1977); Anxious Symptoms = Multidimensional Scale for Children (March, 1997).

TABLE 4. Predicting Depressive Symptoms Among Canadian Adolescents: Estimates of the Fixed Effects Component

Predictor	Parameter Estimate (b)	Standard Error	t-Value	Degrees of Freedom (df)
Dependent Interpersonal Stress:				
Age	0.07	0.48	0.14	1193
Gender	2.02	1.50	1.35	1193
Anxious Symptoms	0.42	0.08	4.95***	1193
Initial Depressive Symptoms	7.51	0.72	10.37***	1193
Extrinsic Aspirations Score	1.84	0.73	2.50*	1193
Depressive Symptoms$_{(Time\ T)}$ Model:				1193
Age	-0.39	0.27	-1.41	1193
Gender	2.52	0.86	2.94**	1193
Anxious Symptoms	0.17	0.06	2.96**	1193
Initial Depressive Symptoms	4.84	0.52	9.25***	1193
Initial Dependent Interpersonal Stress	1.29	0.65	1.99*	1193
Dependent Interpersonal Stress $_{(Time\ T-1)}$	0.13	0.03	4.17***	1193
Extrinsic Aspirations Score	0.29	0.42	0.69	1193

Note. Extrinsic Aspirations Score examines extrinsic aspirations relative to intrinsic goals. *p < .05, **p < .01, ***p < .001.

estimation. The random slope was significant and retained in the model. The final results with respect to the fixed effects component of the model are presented in Table 4. Of primary importance, a significant mediation model emerged. More specifically, when controlling for the proportion of variance accounted for by dependent interpersonal stress$_{(Time\ T-1)}$ in predicting changes in follow-up depressive symptoms$_{(Time\ T)}$, $b = 0.13$, SE = 0.03, $t(1193) = 4.17$, $p < 0.001$, a test of the indirect effect indicated that high levels of dependent interpersonal stress$_{(Time\ T-1)}$ fully mediated the relationship between high levels of relative extrinsic aspirations and high levels of depressive symptoms$_{(Time\ T)}$ ($b = 0.26$, SE = 0.08; see Figure 2). Further, the 95% confidence interval of indirect effect (.01, .47) suggests that mediation effect is significant as the range does not include zero.

We next examined whether the mediation effect was specific to dependent interpersonal as opposed to noninterpersonal stress, and thus, we utilized the same data analytic approach outlined
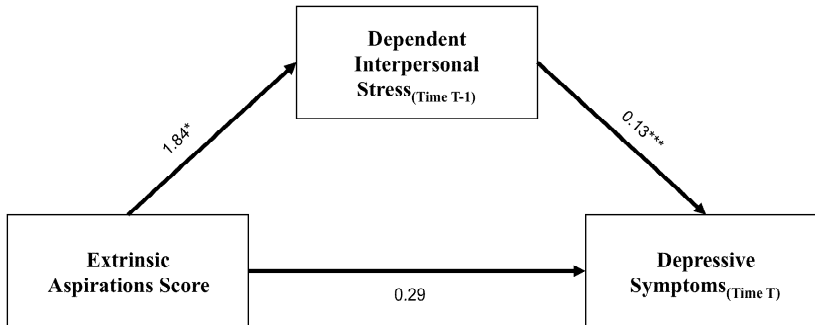
Note. *p<.05, **p<.01, ***p<.001; Extrinsic Aspirations Score examines extrinsic aspirations relative to intrinsic goals.

FIGURE 2. Mediation model examining the relationship between extrinsic aspirations, dependent interpersonal stress$_{(Time\ T-1)'}$ and depressive symptoms$_{(Time\ T)}$ in Canadian adolescents.

above with the exception that noninterpersonal stress replaced dependent interpersonal stress as the potential mediator. When examining changes in depressive symptoms over time, the model included an autoregressive covariance structure and a random intercept. Results indicated a nonsignificant mediation model when predicting depressive symptoms. Specifically, while higher levels of relative extrinsic aspirations predicted a greater occurrence of noninterpersonal stress, $b = 1.67$, SE = 0.36, $t(1193) = 4.64$, $p < 0.001$, noninterpersonal stress$_{(Time\ T-1)}$ did not predict changes in depressive symptoms$_{(Time\ T)}$ over time $b = 0.04$, SE = 0.06, $t(1193) = 0.62$, *ns*. Given the nonsignificant relationship between noninterpersonal stress$_{(Time\ T-1)}$ and depressive symptoms$_{(Time\ T)'}$ the mediation model is not significant which suggests model specificity.

ANXIOUS SYMPTOMS AMONG CANADIAN ADOLESCENTS: IDIOGRAPHIC, TIME-LAGGED MEDIATION MODEL

As a preliminary step, multilevel modeling analyses examined whether higher levels of relative extrinsic aspirations predicted changes in anxious symptoms over time. The model included an autoregressive covariance structure and a random intercept. Results indicated that the main effect model was not significant, $b = 0.06$, SE = 0.15, $t(240) = 0.39$, *ns*. As this relationship is essential within a mediation model, no further analyses examining anxious symp-

**TABLE 5. Predicting Depressive Symptoms among Chinese Adolescents: Estimates of the Fixed Effects Component**

Predictor	Parameter Estimate (*b*)	Standard Error	*t*-Value	Degrees of Freedom (*df*)
Dependent Interpersonal Stress				
Age	-0.48	.45	-1.06	3216
Gender	1.52	0.86	1.77	3216
Anxious Symptoms	0.33	0.01	21.92***	3216
Initial Depressive Symptoms	2.76	0.46	5.99***	3216
Extrinsic Aspirations Score	1.60	0.42	3.78**	3216
Depressive Symptoms$_{(Time\ T)}$ Model				
Age	0.37	0.29	1.25	3216
Gender	-0.31	0.56	-0.56	3216
Anxious Symptoms	0.09	0.01	7.32***	3216
Initial Depressive Symptoms	3.74	0.35	10.84***	3216
Initial Dependent Interpersonal Stress	0.54	0.36	1.51	3216
Dependent Interpersonal Stress $_{(Time\ T-1)}$	0.10	0.02	2.58**	3216
Extrinsic Aspirations Score	0.73	0.28	1.91^T	3216

Note. Extrinsic Aspirations Score examines extrinsic aspirations relative to intrinsic goals. *$p < .05$, $^Tp = .06$, **$p < .01$, ***$p < .001$.

toms with dependent interpersonal or noninterpersonal stress were conducted.

DEPRESSIVE SYMPTOMS AMONG CHINESE ADOLESCENTS: IDIOGRAPHIC, TIME-LAGGED MEDIATION MODEL

When examining the main effect model regarding whether higher levels of relative extrinsic aspirations predict higher levels of depressive symptoms, baseline depressive symptoms, anxious symptoms, and gender were entered as covariates. The autoregressive covariance structure and random intercept were significant. Results indicated that higher levels of relative extrinsic aspirations predicted higher levels of depressive symptoms, $b = 0.57$, SE $= 0.21$, $t(390) = 2.68$, $p < 0.01$. As the main effect model was significant, the full mediation model was examined.
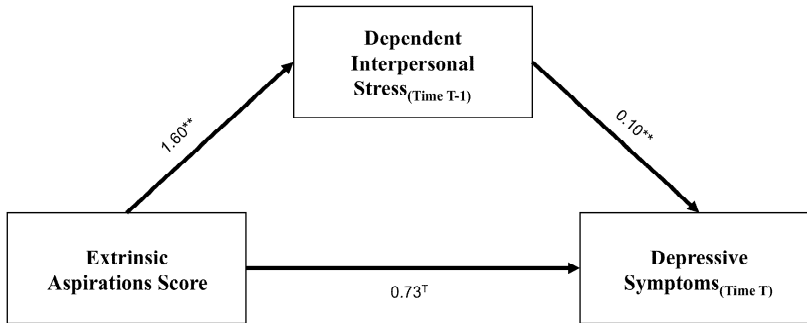
*p<.05, ᵀp=.06, **p<.01, ***p<.001; Extrinsic Aspirations Score examines extrinsic aspirations relative to intrinsic goals.

FIGURE 3. Mediation model examining the relationship between extrinsic aspirations, dependent interpersonal stress$_{(Time T-1)}$, and depressive symptoms$_{(Time T)}$ in Chinese adolescents.

The autoregressive covariance structure and random slope were significant, however, as the random intercept was not significant, it was removed from the model prior to re-estimation. The final results with respect to the fixed-effects component of the model are presented in Table 5. When controlling for the proportion of variance accounted for by dependent interpersonal stress$_{(Time T-1)}$ in predicting changes in follow-up depressive symptoms$_{(Time T,}$ $b = 0.10$, SE $= 0.02$, $t(3216) = 5.79$, $p < 0.001$, a test of the indirect effect indicated that high levels of dependent interpersonal stress$_{(Time T-1)}$ mediated the relationship between high levels of relative extrinsic aspirations and high levels of depressive symptoms$_{(Time T)}$ ($b = 0.16$, SE $= 0.05$; see Figure 3). When examining the test of the indirect effect, the 95% confidence interval (.06, .27) suggests that mediation effect is significant as the range does not include zero.

Similar to our data analytic approach with the Canadian adolescents, we also examined the model using noninterpersonal stress as the mediator. The final model included an autoregressive covariance structure and random intercept. Results indicated that when controlling for the proportion of variance accounted from by noninterpersonal stress$_{(Time T-1)}$ in predicting changes in follow-up depressive symptoms$_{(Time T,}$ $b = 0.13$, SE $= 0.03$, $t(3216) = 4.44$, $p < 0.001$, our test of the indirect effect indicated that high levels of dependent interpersonal stress$_{(Time T-1)}$ mediated the relationship between high levels of relative extrinsic aspirations and high levels of depressive symptoms$_{(Time T)}$ ($b = 0.09$, SE $= 0.03$). When examining the test of the indirect effect, the 95% confidence interval (.02, .16) suggests that

mediation effect is significant as the range does not include zero (see Figure 4).

ANXIOUS SYMPTOMS AMONG CHINESE ADOLESCENTS: IDIOGRAPHIC, TIME-LAGGED MEDIATION MODEL

Multilevel modeling analyses examined whether higher levels of relative extrinsic aspirations predicted fluctuations in anxious symptoms over the course of the study. Baseline levels of anxious symptoms, depressive symptoms over the follow-up period, and gender were entered as covariates. The model included an autoregressive covariance structure and a random intercept ($p < .001$). Results indicated that the main effect model was not significant $b = -0.05$, SE = 0.13, $t(384) = -0.42$, *ns*. As this relationship is essential within a mediation model, no further analyses examining anxious symptoms with either dependent interpersonal or noninterpersonal stress were conducted.

DISCUSSION

A large body of research has found support for stress generation, a process in which individuals' depressive symptoms, personal characteristics, and/or behaviors actively contribute to the occurrence of stressful life events (see Hammen & Shih, 2008). More recent research among adolescents has begun to delineate the stress generation effect that is due to depressive symptoms as opposed to more enduring vulnerabilities including cognitive (Auerbach, Eberhart, & Abela, 2010) and interpersonal (Auerbach et al., 2011; Shih et al., 2009) factors. To our knowledge, no research has explored whether relative extrinsic aspirations influences the occurrence of dependent interpersonal stress and subsequent depressive and anxious symptoms within a stress generation framework. In an effort to address both theoretical and methodological gaps in the extant literature, we examined whether higher levels of extrinsic aspirations, relative to intrinsic goals, impacted the manifestation of stress and both depressive and anxious symptoms in samples of adolescents from Canada and mainland China using a multi-wave, longitudinal design. In order to do so, the present study examined the idiographic, time-lagged relationship among relative extrinsic goals, stress, and
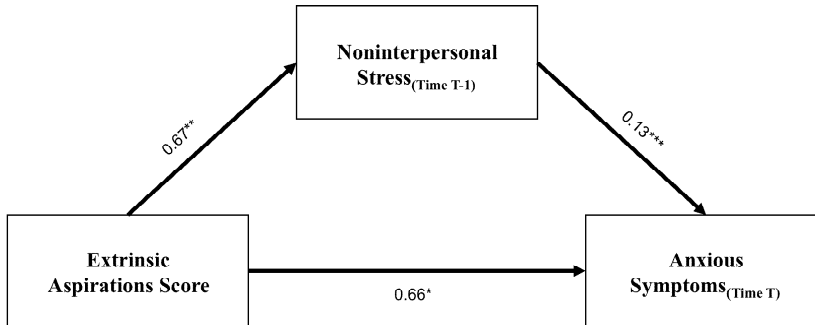
*p<.05, **p<.01, ***p<.001; Extrinsic Aspirations Score examines extrinsic aspirations relative to intrinsic goals.

FIGURE 4. Mediation model examining the relationship between extrinsic aspirations, noninterpersonal stress$_{(Time T-1)}$, and depressive symptoms$_{(Time T)}$ in Chinese adolescents.

symptoms, which more adequately addresses questions regarding the temporal unfolding of depressive and anxious symptomology.

In line with our hypothesis, a greater occurrence of dependent interpersonal, but not noninterpersonal, stress mediated the relationship between higher levels of extrinsic aspirations, relative to intrinsic goals, and subsequent depressive symptoms among Canadian adolescents. Specifically, the findings indicate that extrinsically-motivated individuals generate a significant amount of dependent interpersonal stressors, which, over time, may ultimately undermine their interpersonal functioning. Further, consistent with past research examining the relationship between stress generation and prospective depressive symptoms (e.g., Auerbach et al., 2011; Auerbach, Eberhart, & Abela, 2010), dependent interpersonal stress predicted higher levels of depressive symptoms over time. While extrinsic goals may have an adaptive function (i.e., motivating certain behaviors), there seems to be an interpersonal cost when such goals begin to eclipse intrinsic aspirations. Thus, as individuals continue to pursue extrinsic goals, they may deplete those interpersonal resources that buffer the adverse impact of stress on mental health. It is important to note that the present study provided a particularly conservative examination of our hypothesis as we controlled for anxious symptoms throughout the course of the study. Consequently, our findings highlight the deleterious role that extrinsic aspirations may play in contributing to poorer interpersonal and psychological outcomes over time.

Contrary to our hypothesis, dependent interpersonal stress did not mediate the relationship between extrinsic aspirations and anxious symptoms. Interestingly, while extrinsic aspirations did not predict change in anxious symptoms over time, correlation analyses indicated that a greater emphasis on extrinsic goals relative to intrinsic aims was associated with lower levels of anxious symptoms at the initial assessment. Given that our prospective findings were not significant, the cross-sectional findings should be interpreted with caution. These findings conflict with Kasser and Ryan's (1993) initial work in which they examined the relationship between the relative centrality of one's financial success as opposed to self-acceptance, affiliation, or community feeling and symptoms of depression and anxiety. Irrespective of gender, individuals who placed a heightened focus on the attainment of wealth reported decreased psychological well-being. One potential explanation for our cross-sectional results is that extrinsic aspirations may be a short-term coping strategy that facilitates adolescents' efforts to "blend in" shielding them from social exclusion. Meaning, adolescents who want to be accepted by their peers may present themselves in a more socially appealing manner in an effort to gain peer affiliation and reduce social anxiety. While this strategy may initially reduce anxiety, the attenuation is likely difficult to sustain (i.e., see prospective main effect model). Given that the findings were not hypothesized a priori, the current results should be replicated before more substantive conclusions can be drawn.

AN EXAMINATION OF DEPRESSIVE AND ANXIOUS SYMPTOMS IN MAINLAND CHINA

China is a unique amalgamation of ideals in that it is politically communistic, economically capitalistic, and socially collectivistic (Auerbach, Abela, Zhu, & Yao, 2007). At the same time, younger generations are pursuing more extrinsic and individualistic aspirations, that are conflicting with core collectivistic principles of older generations including the central role of the extended family and the interdependent sense of self (Yeh & Inose, 2002; Yeh & Wang, 2000). Given this ideological shift, models of psychopathology developed for Western adolescents are becoming increasingly relevant to Chinese individuals. In the current study, similar to the results for the North American adolescents, dependent stress mediated the

relationship between depressive, but not anxious, symptoms and extrinsic aspirations, thus providing support for the cross-cultural applicability of our hypothesized model. To our knowledge, this is the first study to examine the role that extrinsic (relative to intrinsic) aspirations play within a stress generation framework among Chinese adolescents. However, recent materialism research from China may shed some insight into these findings. Specifically, Rosen (2003) found that secondary school students in urban China endorsed higher levels materialism as compared to adults. While the secondary school students placed substantial value on materialistic goals (e.g., pursuit of wealth and fame), adults endorsed collectivistic values including an emphasis on family cohesion, moderation, and self-sacrifice (Rosen, 2003). The latter finding suggests an additional route through which materialism may contribute to interpersonal discord within the lives of Chinese youth. Namely, it seems that the ideological divide may be contributing to increased interpersonal stress within families, and to the extent that materialistic values erode the interconnectedness within the family unit, an adolescent may possess fewer resources to manage stress and subsequent depressive symptoms.

Interestingly, noninterpersonal stressors also mediated the relationship between extrinsic aspirations and higher levels of depressive symptoms over time. The result conflicts with the Canadian sample, which may suggest a cultural difference regarding the role of extrinsic aspirations, relative to intrinsic goals, in the stress generation framework. One possibility for these findings among Chinese adolescents may be that extrinsically-motivated goals generate noninterpersonal stressors including academic or achievement-related issues (e.g., bad report card, failing a test, and inability to understand classroom material) as these pursuits may compromise one's scholastic commitment. Namely, when individuals divert time, resources, and energy away from the classroom to pursue extrinsic needs, achievement-based activities often suffer. In collectivistic societies, an adolescent's performance, especially within the academic domain, reflects strongly on one's family and community, and thus, failures may be particularly stressful and emotionally taxing. Consequently, otherwise benign missteps may carry more weight, which ultimately has the potential of exacerbating depressive symptoms.

In contrast to our hypothesis, dependent stress did not mediate the relationship between materialism and anxious symptoms

among Chinese adolescents. Further, extrinsic aspirations, relative to intrinsic goals, were neither cross-sectionally nor prospectively associated with anxious symptoms. Such null findings suggest that it may be worthwhile to examine different culturally salient vulnerability factors. For example, the fear of losing face, or a failure to sustain respect and honor in a public sphere, may be particularly relevant to anxiety. More specifically, Chinese adolescents are under continual pressure to excel in school as it is viewed as an opportunity to rise from poverty to prosperity. Scholastic anxiety may ultimately stem from a fear of losing face in front of peers, family, and teachers. Further, as parents and teachers place considerable pressure on adolescents to succeed in the classroom, it likely creates considerable stress, including within the interpersonal domain. Alternatively, there is a concept in Mandarin, kiasu, which is translated as a fear of losing to others. More colloquially, it connotes the notion that one must keep up with the Joneses, which understandably undercuts intrinsically-motivated behaviors. Similar to saving face, such kiasu-ism may generate relational stressors, which then contributes to the onset of anxiety if or when a desired lifestyle cannot be sustained. Taken together, saving face and/or kiasu may provide a window through which to better understand adolescent anxiety in mainland China.

As described above, the present study included a number of empirical and methodological improvements over previous studies on extrinsic versus intrinsic goals. At the same time, there are several limitations. First, the present study utilized self-report measures that are prone to response biases and have diagnostic limitations. More specifically, the present study examined idiographic symptom fluctuation, however, we did not assess for clinically significant mood or anxiety disorders. Therefore future research should continue to explore how aspirations shape subsequent psychopathology by utilizing more sophisticated assessment techniques such as peer and parent ratings, semi-structured diagnostic interviews, and direct behavioral observation in order to examine these constructs. Second, the current study included samples of urban adolescents from Montreal, Canada, and Yue Yang, China. While each sample was large and retention high over the repeated assessments, it is difficult to ascertain the generalizability of the findings. Specifically, each of the samples was homogenous in terms of the ethnicity. Therefore, research is warranted to better understand whether our results would extend to community-based samples from an array of

regions in both Canada and China. Third, the present sample was recruited from schools in Montreal and Yue Yang, and participation was based on consent from both student and parent/guardian as well as logistical constraints imposed by the average school day. All students were encouraged to participate, however, reasons for non-participation were not assessed. While the present sample is in line with the greater demographic distribution of Quebec and Hunan, it is not possible to determine if there were other differences between the participants and those who opted out of the present study. As these differences may have influenced our current findings, future research should include data regarding reasons for nonparticipation. Fourth, the current study estimated complex idiographic, time-lagged multilevel models, which allowed for relatively strong inferences regarding the temporal unfolding of stress and depressive symptoms. At the same time, the data analytic approach employed does not determine effect size, which may be important as a means of improving communication about the proposed models. Fifth, in order to assess relative endorsement of extrinsic to intrinsic aspirations, we utilized a subtraction method. Such an approach is consistent with researchers who utilize the Aspirations Index (e.g., Kasser, 2002). At the same time, the approach is not without methodological limitations (see Mowen & Voss, 2008). Sixth, research has indicated that adolescents report a higher number of and greater emotional reactivity to dependent interpersonal stressors (Auerbach, Bigda-Peyton, Eberhart, Webb, & Ho, 2011; Auerbach, Eberhart, & Abela, 2010; Rudolph & Hammen, 1999). At the same time, as stress is one of the most robust predictors of psychopathology (e.g., Grant et al., 2004), it is likely that other types of stressors may also shape depressive and anxious symptoms. Further, the current study did not identify specific dependent interpersonal or noninterpersonal stressors that may have exhibited particularly robust associations with depressive or anxious symptoms. Thus, future research is warranted to examine whether different types of stressors differentially predict psychopathology as well as if specific life events may be differentially predictive of depression and anxiety. Last, as the study examines the impact of extrinsic aspirations on subsequent symptom change, it is preferable to control for socioeconomic status. Unfortunately, given a methodological confound, the majority of Canadian participants did not provide such information. As we strove to have parity in all our analyses, we did not

include socioeconomic status as a covariate in either sample, which is a limitation of the current study.

In conclusion, the present study highlights the relationship between aspirations, stress, and depressive symptoms in culturally-distinct samples of adolescents. Traditional prevention and treatment programs primarily target cognitive and interpersonal vulnerability factors. However, the findings in the present study suggest that clinicians must also understand a patient's core values as they may play an important role in shaping stress generation and subsequent symptoms. In considering these values, clinicians may help adolescents better understand how symptoms arise as well as how they can better manage them. Specifically, the present findings underscore the danger in pursuing extrinsic aspirations at the expense of intrinsic goals. Thus, clinicians would likely benefit from facilitating the development, and encouraging the pursuit, of intrinsic goals in their patients.

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