Published in final edited form as:

J Res Adolesc. 2014 December ; 24(4): 646–653. doi:10.1111/jora.12054.

Reciprocal Pathways Between Autonomous Motivation and Affect: A Longitudinal Investigation of American and Chinese Early Adolescents

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Abstract

The current research examined the reciprocal pathways between children's autonomous motivation in school and affect over early adolescence in the United States and China. Beginning in the fall of 7th grade, 825 American and Chinese children (mean age = 12.73 years) reported on their autonomous (vs. controlled) motivation as well as unpleasant and pleasant affect every six months until the end of eighth grade. In both the United States and China, there were negative reciprocal pathways between children's autonomous motivation and unpleasant affect: Over time, heightened autonomous motivation predicted dampened unpleasant affect, which in turn predicted heightened autonomous motivation. Positive reciprocal pathways between children's autonomous motivation and pleasant affect were evident over time only in China.

Keywords

Academics; autonomy; affect; culture; emotion; motivation

As children enter adolescence, they often lose interest in learning; their pursuit of academic endeavors is motivated less by choice than pressure (for a review, see Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006). Such dampened autonomous motivation may undermine children's affect given that fulfillment of the need for autonomy is considered critical to well-being (Deci & Ryan, 1985), with empirical evidence linking autonomous motivation in school to affect (e.g., Walls & Little, 2005). The majority of evidence, however, comes from research conducted in the West. The few studies in other parts of the world have used concurrent correlational designs (e.g., Vansteenkiste, Zhou, Lens, & Soenens, 2005), making the direction of effects unclear. This is a serious lacuna given debate over whether dampened autonomous motivation has the same costs in interdependent cultures, such as East Asia, as in independent cultures, such as the West (e.g., Iyengar & Lepper, 1999; Ryan & Deci, 2000).

The current research examined whether children's autonomous (vs. controlled) motivation in school contributes to their affect in China to the same extent as in the United States. Given characterizations of affect as consequential for motivation (e.g., Fredrickson, 1998), we also evaluated whether children's affect contributes to their motivation such that there are reciprocal pathways in the two countries. Unpleasant and pleasant affect were distinguished as there is substantial evidence from research with children and adults that the two represent distinct, albeit related, systems (e.g., Diener, Smith, & Fujita, 1995; Laurent et al., 1999). *Unpleasant affect* includes emotions (e.g., sadness, shame, nervousness, and frustration) whose experience is assumed to be disagreeable, difficult, or uncomfortable; in contrast, *pleasant affect* includes emotions (e.g., joy, love, enthusiasm, and peacefulness) whose experience is assumed to be agreeable, pleasing, or enjoyable (e.g., Diener et al., 1995; Larsen & Diener, 1992).

Reciprocal Pathways between Motivation and Affect

A key tenet of Self-Determination Theory (Deci & Ryan, 1985) is that there is a basic need to experience the self as autonomous. When children pursue academic endeavors because they are enjoyable or important to them, they are autonomously motivated in school; but when they do so because of pressure – either internal pressure, such as guilt, or external pressure, such as punishment – their motivation is controlled. Greater autonomous (vs. controlled) motivation in school may lead to dampened unpleasant and heightened pleasant affect given that the fulfillment of the basic need for autonomy facilitates children's well-being (Deci & Ryan, 1985; Ryan & Deci, 2000), of which affect is a key component (Diener, Suh, Lucas, & Smith, 1999). Indeed, the more children and adults are autonomously motivated, the better their well-being in the West and East Asia (e.g., Jang, Reeve, Ryan, & Kim, 2009; Walls & Little, 2005), with evidence from the United States that autonomous motivation predicts enhanced well-being over time adjusting for earlier well-being (e.g., Sheldon, Ryan, Deci, & Kasser, 2004).

The association between children's autonomous motivation in school and well-being may also reflect a tendency for children's affect to contribute to their motivation such that there are reciprocal pathways between the two. Unpleasant affect, as manifest in depression and anxiety, appears to lead individuals to feel they lack control over their environment – for example, over time they come to view their failures as due to a lack of ability or luck (e.g., Nolen-Hoeksema, Girgus, & Seligman, 1986; Pomerantz & Rudolph, 2003). Hence, unpleasant affect may undermine autonomous motivation. Conversely, in her Broaden-and-Build Theory of emotions, Fredrickson (1998) makes the case that pleasant emotions signal that the environment is safe, thereby allowing for the dedication of resources to exploration, integration, and achievement, which may foster autonomous motivation. Western experimental research suggests that affect plays a causal role in motivation and achievement (for a review, see Lyubomirsky, King, & Diener, 2005), although little attention has been directed to autonomous motivation per se.

The Role of Culture

If there are reciprocal pathways between children's autonomous motivation in school and affect, a key question is whether they are similar in the United States and China. It has been argued that feeling autonomous is not of import among individuals from interdependent cultures, such as China (e.g., Iyengar & Lepper, 1999). However, consistent with universalist views of the need for autonomy (e.g., Ryan & Deci, 2000), heightened autonomous motivation in school is associated with enhanced well-being among East Asians (e.g., Jang et al., 2009; Vansteenkiste et al., 2005). It is even possible that autonomous motivation in school plays a larger role in affect during adolescence in East Asia (vs. the West) because East Asian children spend more time on schoolwork than do their American counterparts (e.g., Wang & Pomerantz, 2009), who are more engaged in social and athletic activities (Larson & Verma, 1999). In most Chinese middle schools, children are at school for eight hours, leaving few opportunities for hanging out with friends or engaging in the extracurricular activities (e.g., sports and band) commonly offered by American, but not Chinese, schools.

Also of significance is whether the role of children's affect in their autonomous motivation in school is similar in the United States and China. On the one hand, the American independence orientation leads affect to be highly regarded because its experience is viewed as a part of the “‘real’ self” (Markus & Kitayama, 1991, p. 236), which is of less import in East Asia. As a consequence, affect may play a more central role in American (vs. Chinese) children's autonomous motivation (e.g., Oishi & Koo, 2008). On the other hand, the resources afforded by pleasant (vs. unpleasant) affect may have basic motivational features that cut across cultural values. Such features may be intensified when it comes to the academic arena in East Asia (vs. the West) given East Asian children's heightened engagement in the arena (e.g., Wang & Pomerantz, 2009).

Overview of the Current Research

Following children over early adolescence, the goals of the current research were twofold. First, we examined whether there are reciprocal pathways between children's autonomous motivation in school and their affect. We anticipated that heightened autonomous motivation would enhance affect, which in turn would foster motivation. Because unpleasant and pleasant affect represent distinct, albeit related, systems, differences between the two were considered possible. For example, the fulfillment of autonomy needs in any arena may be necessary to inhibit unpleasant affect; but for such fulfillment to foster pleasant affect, the arena may need to be central to children's lives – as may be the case for the academic arena in China, but not the United States. Second, we evaluated the relative strength of the reciprocal pathways in the two countries. This was of import because although prior research has identified associations between autonomous motivation in school and well-being in East Asia, the direction of effects is unclear.

Across these two aims, we sought to ensure that the reciprocal pathways did not simply reflect global psychological adjustment among children during early adolescence. To this end, we took children's self-esteem into account in our analyses. In addition, theoretical

perspectives on the role of autonomous motivation in children's affect suggest that it should be at least partially direct because autonomous motivation reflects the fulfillment of the basic need of autonomy. Similarly, contributions of affect to autonomous motivation are viewed as driven by the resources provided by affect (e.g., exploration and integration) rather than by feeling positively about the self. Thus, although children's self-esteem may contribute to the reciprocal pathways, it was not anticipated to account for them entirely.

Method

Participants

The University of Illinois US-China Adolescence Study started when children entered a new school in seventh grade and concluded at the end of eighth grade in the suburbs of Chicago in the United States and the suburbs of Beijing in China. Participants were 374 American children (187 boys and 187 girls; mean age = 12.78 years, $SD = .34$ in the fall of seventh grade) and 451 Chinese children (240 boys and 211 girls; mean age = 12.69 years, $SD = .46$ in the fall of seventh grade). In each country, children attended either average- or above average-achieving public schools in primarily working- or middle-class areas. Reflecting the ethnic composition of the areas from which they were recruited, American participants were primarily of European descent (88%), with 9% of Hispanic, 2% of African, and 1% of Asian descent. Almost all of the residents in the areas from which the Chinese participants were recruited were of the *Han* ethnicity, which is the major ethnicity in China.

Procedure

Beginning in the fall of seventh grade, children completed questionnaires during two 45-min. sessions every six months until the end of eighth grade. In total, there were four waves of data collection: Fall of seventh grade (Wave 1), spring of seventh grade (Wave 2), fall of eighth grade (Wave 3), and spring of eighth grade (Wave 4). A trained native research assistant read the instructions and items aloud to children in their native language in the classroom. Children responded on their own using rating scales. Attrition over the entire four waves was 4% (2% in the United States and 6% in China). Ninety-six percent of children had the data required for all the analyses at three or more waves of the study. Children with no missing data did not differ from those with missing data at Wave 1 on any of the measures examined in this report.

Measures

The measures were initially created in English. To ensure their equivalence in the United States and China, standard translation and back-translation procedures (Brislin, 1980) were followed to generate the Chinese versions, with repeated discussion to modify the wording of the items to ensure similarity in their meanings in the English and Chinese versions (Erkut, 2010). Linguistic factors were taken into account so that the measures were understandable to children in both countries. For example, there were a few cases in which literal translation of the items from English to Chinese was awkward or ambiguous. In such cases, new items with similar meanings were created in English to replace the old items and then translated into Chinese.

Autonomous motivation—Children's autonomous motivation in school was assessed with the Academic Self-Regulation Questionnaire (Ryan & Connell, 1989), which consists of autonomous and controlled reasons for engaging in four academic activities (e.g., doing homework and working on classwork). Autonomous reasons include seven intrinsic reasons focusing on enjoyment and mastery (e.g., “I do my homework because it's fun.” α s = .87 to .90 in the United States and .83 to .94 in China) and seven identified reasons focusing on personal importance (e.g., “I work on my classwork because it's important to me to do so.” α s = .86 to .91 in the United States and .84 to .90 in China). Controlled reasons include nine introjected reasons focusing on internal pressure (e.g., “I work on my classwork because I'll be ashamed of myself if it doesn't get done.” α s = .87 to .91 in the United States and .78 to .87 in China) and nine external reasons focusing on external pressure (e.g., “I do my homework because I'll get in trouble if I don't.” α s = .80 to .88 in the United States and .69 to .77 in China). Children rated how true (1 = *not at all*, 5 = *very*) each was of them. As in prior research (e.g., Grolnick & Ryan, 1989), a relative autonomy index was created by combining the reasons: The autonomous reasons were weighted positively (i.e., because the intrinsic reasons are the most autonomous, they were weighted by positive two with the identified reasons weighted by positive one) and the controlled reasons negatively (i.e., because the external reasons are the most controlled, they were weighted by negative two with the introjected reasons weighted by negative one). The relative autonomy indexes for each of the four academic situations (8 items each) were used as parcels for the latent autonomous motivation construct.

Affect—Unpleasant and pleasant affect were assessed following Diener and colleagues (1995) who systematically sampled emotions. To yield an even broader representation, we added emotions included in Watson, Clark, and Tellegen's (1988) and Patrick, Skinner, and Connell's (1993) scales. Children indicated how often (1 = *never*, 5 = *very often*) in the past week they experienced each of 15 *unpleasant emotions* (e.g., sad, disappointed, nervous, and frustrated) and 14 *pleasant emotions* (e.g., happy, caring, calm, and enthusiastic). For each type of affect, children's responses were combined (α s = .89 to .94 in the United States and .86 to .92 in China). The latent construct for each type was represented by four parcels of emotions, each comprised of three to five emotions: For unpleasant affect, sadness-related emotions, shame and guilt emotions, fear-related emotions, and anger-related emotions; for pleasant affect, joy-related emotions, social emotions, low arousal pleasant emotions, and high arousal pleasant emotions. As in prior research (e.g., Diener et al., 1995; Laurent et al., 1999), unpleasant and pleasant affect were moderately inversely associated, with the magnitude similar in the United States (r s = -.33 to -.40, p s < .001) and China (r s = -.32 to -.45, p s < .001) at each wave, z s < 1.70, n s.

Self-esteem—Children's self-esteem was assessed with Tatarodi and Swann's (1995) 20-item scale, which assesses evaluations of worth (e.g., “I feel good about myself.”) and ability (e.g., “I am a capable kid.”). Children indicated how true (1 = *not at all true*, 5 = *very true*) each statement was of them. Children's responses were combined (α s = .93 to .96 in the United States and .90 to .92 in China). An evaluation of worth parcel (10 items) and an evaluation of ability parcel (10 items) were used in creating the self-esteem latent construct.

Results

We conducted our analyses within a Structural Equation Modeling (SEM) framework with AMOS 17.0 (Arbuckle, 1995-2008). AMOS handles missing data with Full Information Maximum Likelihood (FIML) estimates which provide more reliable standard errors to handling missing data under a wider range of conditions than does not only list- and pair-wise deletion, but also mean-imputation (e.g., Arbuckle, 1996).

Measurement Equivalence

Two-group Confirmatory Factor Analyses (CFAs) were conducted to evaluate the metric invariance of the measures between the United States and China over time. Such invariance is essential and sufficient in making valid comparisons of the associations (e.g., Little, 1997), which was the focus of the current research. In each set of CFAs, a baseline (unconstrained) model was compared with a constrained model. The baseline model consisted of the same latent construct repeatedly assessed over the four waves yielding a total of four latent constructs which were allowed to correlate with one another (for the parcels used as indicators for each construct, see the Method); errors of the same indicators were also allowed to correlate across each of the four waves (e.g., McDonald & Ho, 2002) when suggested by modification indexes from the CFAs conducted on the sample with no missing data. In the constrained model, the factor loadings of the same indicators were forced to be equal across countries and waves.

Although changes in chi-square are advocated for model comparisons (e.g., McDonald & Ho, 2002), Little (1997) maintains that changes in the fit indexes are appropriate for evaluating measurement equivalence because such an endeavor is driven by a modeling, rather than statistical, rationale. Simulation studies support this approach suggesting that decreases in the CFIs and increases in RMSEAs of .01 or less from the baseline to constrained model reflect invariance (Chen, 2007; Cheung & Rensvold, 2002). The baseline and constrained models for the measures fit the data adequately, $\chi^2_s < 767$, $ps < .05$, CFIs $> .92$, TLIs $> .90$, RMSEAs $< .08$. Moreover, the decreases in the CFIs and increases in RMSEAs from the baseline to constrained models were less than or equal to .01. Thus, the measures are metrically invariant between countries and over time, thereby permitting comparisons of their associations.

Reciprocal Pathways

The reciprocal pathways between autonomous motivation and affect over time in the United States and China were evaluated in two-group bidirectional cross-lagged SEMs for each type of affect. The latent constructs of children's affect at each wave were predicted from the latent constructs of their autonomous motivation at the prior adjacent waves, such that six-month lags were examined. Conversely, the latent constructs of children's autonomous motivation at each wave were predicted from the latent constructs of their affect at the prior adjacent waves (see Figure 1 and 2). Auto-regression was taken into account by including the stability of each construct from each wave to the subsequent adjacent wave. The concurrent associations between the two constructs were included by correlating the two (Wave 1) or their errors (Wave 2, 3, and 4) within each wave.

Given that we did not anticipate differences in the cross-lagged paths across the three timeframes (i.e., Wave 1 to 2, Wave 2 to 3, and Wave 3 to 4) as well as preliminary analyses suggesting that there were not consistent differences between the three, the three cross-lagged paths for each direction of effects were forced to be equal to one another. Drawing from the measurement equivalence analyses, the factor loadings of the indicators of the constructs were constrained to be equal across waves and countries. Otherwise, the parameters were left unconstrained in the baseline models. In the constrained models, the cross-lagged paths across the three timeframes in one direction (e.g., autonomous motivation predicting pleasant affect) were simultaneously forced to be equal between countries. Country differences were determined by chi-square differences (χ^2) between the two models.

As shown in Figure 1, comparison of the baseline and constrained models, χ^2 s < 1339, ps < .001, CFIs > .96.94, TLIs > .95, RMSEAs < .03, indicated that in both the United States and China, $\chi^2 = 1.48$, ns , the more autonomously motivated children were at one point in time, the less unpleasant their affect six months later over and above their earlier unpleasant affect. It was also the case that children's unpleasant affect predicted their subsequent autonomous motivation similarly in the two countries, $\chi^2 < 1$: The more unpleasant American and Chinese children's affect at one time point, the less autonomously motivated they were six months later. Thus, the negative reciprocal pathways between children's autonomous motivation and unpleasant affect were similarly evident in the United States and China.

In China, but not the United States, $\chi^2 = 11.57$, $p < .001$, across the three timeframes, the more autonomously motivated children were, the more pleasant their affect six months later over and above their earlier pleasant affect (see Figure 2), χ^2 s < 1391, ps < .001, CFIs > .96, TLIs > .95 RMSEAs < .03. Conversely, although children's pleasant affect was not predictive of their subsequent autonomous motivation in the United States, it was in China, $\chi^2 = 8.25$, $p < .01$: The more pleasant Chinese children's affect, the more autonomously motivated they were six months later, taking into account their earlier motivation. Thus, the positive reciprocal pathways between children's autonomous motivation and pleasant affect were evident in China, but not the United States.

Children's affect and self-esteem were substantially associated at each wave: The higher children's self-esteem, the lower their unpleasant affect ($rs = -.54$ to $-.58$ in the United States and $-.41$ to $-.44$ in China, $ps < .001$) and the higher their pleasant affect ($rs = .65$ to $.68$ in the United States and $.40$ to $.54$ in China, $ps < .001$). Children's self-esteem was positively associated, albeit to a lesser extent, with their autonomous motivation as well in the United States ($rs = .24$ and $.17$ for Wave 1 and 2, $ps < .001$, and $.08$ and $.07$ for Wave 3 and 4, ns) and China ($rs = .23$ to $.32$, $ps < .001$). To ensure that self-esteem was not driving the reciprocal pathways, we added it to the models as a predictor of autonomous motivation and affect at each of the six-month lags; also included was the stability of self-esteem between adjacent waves and the concurrent associations between self-esteem and autonomous motivation as well as affect.

All the models fit well, χ^2 s < 2474, ps < .001, CFIs > .93, TLIs > .92, RMSEAs < .04. For autonomous motivation predicting unpleasant affect over time, the effects remained with self-esteem in the model (coefficients = -.04 to -.05 in the United States, and -.05 to -.06 in China, ps < .001); this was also the case for unpleasant affect predicting autonomous motivation (coefficients = -.07 to -.08 in the United States, and -.05 to -.07 in China, ps < .001). The pattern for the pleasant affect model including self-esteem was quite similar to that not including self-esteem, with no effects in the United States (coefficients = -.01 to .04, ns) and positive effects in China (coefficients = .05 to .10, ps < .05).

Discussion

Using a longitudinal design, the current research demonstrated that children's autonomous (vs. controlled) motivation in school is no less likely to contribute to their affect in China than it is in the United States. Adding to research indicating that autonomous motivation predicts subsequent well-being over and above earlier well-being in the United States (e.g., Sheldon et al., 2004), we showed that it does so in China as well. Moreover, the current research revealed that the reverse is also true: Children's affect contributes to their autonomous motivation in school in the United States and China. Hence, children's autonomous motivation in school and affect appear to mutually reinforce one another, such that a decline in one leads to a decline in the other over early adolescence in the two countries. Interestingly, the reciprocal pathways involving unpleasant affect were evident in both the United States and China, but those involving pleasant affect were evident only in China.

The different pattern for the reciprocal pathways involving unpleasant and pleasant affect is consistent with the idea that the two types of affect are separate, albeit related, systems. The fulfillment of autonomous needs in any arena may protect children against unpleasant affect, but may not necessarily foster pleasant affect unless engagement in the arena takes up a large part of children's lives. Although more research is needed, being autonomously motivated in school may matter more for children's pleasant affect in China (vs. the United States) because Chinese children spend more time on schoolwork (e.g., Wang & Pomerantz, 2009) and less time on other activities such as sports (Larson & Verma, 1999), making school one of the major arenas through which Chinese children fulfill their need for autonomy. In contrast, American children may be able to fulfill their need for autonomy through the social, athletic, or other arenas more easily. In a similar vein, whereas Chinese children may direct the resources emanating from their pleasant affect toward the academic arena, American children may direct the resources to other arenas.

In examining the reciprocal pathways between children's autonomous motivation and affect, we evaluated models including children's self-esteem of the two. Doing so did little to change the findings, indicating that the reciprocal pathways are not merely a reflection of global psychological adjustment. They appear instead to be, at least in part, direct (e.g., autonomous motivation dampens unpleasant affect by fulfilling the need for autonomy) or to occur through mechanisms other than self-esteem (e.g., unpleasant affect contributes to autonomous motivation via perceptions of a lack of control). Notably, although prior research has examined the association between children's autonomous motivation in school

and affect in East Asia (e.g., Jang et al., 2009; Vansteenkiste et al., 2005), the current research is the first to do so using a longitudinal design simultaneously in a Western (i.e., the United States) and East Asian (i.e., China) country with a stringent control (i.e., self-esteem), thereby providing insight into the direction of effects as well as their relative size in the two countries.

The samples used in the current research do not represent the diversity of the United States and China. Thus, questions remain concerning within-culture variations in the reciprocal pathways. The current research was guided by the assumption that the American cultural context in which children reside shapes such pathways given that American values are widely promoted through public representations (Sperber, 1996) such as those found in the media and schools (Heyman, Fu, & Lee, 2008). However, within the United States, children's cultural heritage (e.g., ethnic background or socio-economic status) may also be of import. Thus, there may be important variations within the United States that we were unable to examine given that our American sample was mainly of European descent; cultural heritage may also play a role in China. Of additional concern is that urban areas, such as Beijing, in China have been increasingly exposed to Western values in the past few decades. It is thus unclear to what extent the findings are generalizable to less urban areas.

Despite these issues, the current research indicates that children's autonomous motivation in school contributes to their affect, which contributes to their autonomous motivation. Although these reciprocal pathways were similar in the United States and China for children's unpleasant affect, this was not the case for children's pleasant affect; in fact, they existed only for Chinese children perhaps due to the heightened centrality of school in China (vs. the United States). Taken together, the findings indicate that autonomous motivation is *not* less important to children's well-being during early adolescence in China than in the United States as has been argued by some investigators.

Acknowledgments

This research was supported by National Institute of Mental Health Grant R01 MH57505.

We are grateful to the families who participated in this research. We appreciate the constructive comments provided by Reed Larson and members of the Center for Parent-Child Studies on an early draft of this manuscript.

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Figure 1.

Reciprocal pathways between unpleasant affect and autonomous motivation. *Note.*

Coefficients are for cross-lagged paths. Concurrent associations between unpleasant affect and autonomous motivation are included at each wave, but not depicted in the figure for ease of presentation. See text for information about constraints.

*** $p < .001$.

Figure 2.

Reciprocal pathways between pleasant affect and autonomous motivation. *Note.* Coefficients are for cross-lagged paths. Concurrent associations between pleasant affect and autonomous motivation are included at each wave, but not depicted in the figure for ease of presentation. See text for information about constraints.

*** $p < .001$.