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Cultural Values Influence the Developmental Trajectory of Resistance to Social Influence Over the Course of Adolescence

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ABSTRACT

The opinions of peers are among the most potent factors influencing human decision-making. Research conducted in Western societies suggests that individuals become more resistant to peer influence from late adolescence to adulthood. It is unknown whether this developmental trajectory is universal across cultures. Through two cross-national studies, we present consistent self-report and behavioral evidence for culturally distinct developmental trajectories of resistance to peer influence (RPI). Our findings from the US samples replicated prior findings that reported increasing RPI. Yet, data from the Chinese participants were better fitted using a nonlinear model, displaying a U-shaped trajectory with lowest RPI levels at around 20 years old. In contrast to the long-held belief that increasing RPI from adolescence to early adulthood is a universal developmental trait, we propose that this developmental trajectory may depend on cultural context.

1 | Introduction

The opinions and behaviors of peers are powerful factors influencing human decision-making (Cialdini and Goldstein 2004). The extent to which individuals are able to resist peer influence changes across the lifespan, especially during adolescence (Brechwald and Prinstein 2011). Adolescence represents an important developmental period in which crucial psychological, biological, and neural changes take place (Patton et al. 2014). During this period, adolescents become more independent from their parents, build deeper peer relationships, develop their self-concept, and learn cultural values, all of which prepare them to take on an independent role in society (Pfeifer and Blakemore 2012; Pumariaga and Joshi 2010; Sumter et al. 2009). Peers

exert substantial influence on a range of adolescent attitudes, perceptions, and behaviors (Brechwald and Prinstein 2011) and set the trajectory for a wide range of important health- and risk-related behaviors throughout the lifespan (Jessor 1984). As such, it is particularly important to understand when and how people are most affected by peer influence.

1.1 | Adolescence and Peer Influence

Developmental psychologists have examined developmental changes in the extent to which people are able to maintain their own beliefs, values, and behaviors despite peer influence, or resistance to peer influence (RPI) (Steinberg and Monahan 2007).

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Individual differences in RPI can be measured through self-report surveys (Holt et al. 2010) as well as behavioral tasks that compare participants' behaviors before and after receiving peer feedback that diverges from the participant's views (Braams, Davidow, and Somerville 2018; Cascio et al. 2015; Reiter et al. 2021; Welborn et al. 2016). This line of research generally shows that adolescents demonstrate higher levels of conformity (i.e., the tendency to update one's opinions and behaviors to match the group norms) compared to adults (Chein 2015; Dishion and Tipsord 2011; Knoll et al. 2017; Sherman et al. 2016; Simons-Morton, Lerner, and Singer 2005). On the other hand, RPI steadily increases throughout adolescence until adulthood (Braams, Davidow, and Somerville 2018; Knoll et al. 2017; Steinberg and Morris 2001; Sumter et al. 2009; Walker and Andrade 1996). When individuals' conformity to adult versus adolescent influence was compared, both children and young adults (ages 19–25) conformed more to adult feedback, whereas only young adolescents (ages 12–14) conformed more to adolescent feedback relative to adult feedback (Knoll et al. 2015).

Several accounts have been proposed to explain why adolescents are less resistant to peer influence compared to adults. One account proposes that adolescents' heightened sensitivity to peers and social cues may contribute to relationship formation and skill learning and is developmentally adaptive (Crone and Dahl 2012; Pei et al. 2019; Schriber and Guyer 2016). For example, peer influence can help promote cooperation, volunteering, and donation among adolescents (Park and Shin 2017; Van Hoorn et al. 2016). Conversely, late adolescence is marked by a stronger sense of self-identity and autonomy (Brehm 1966; Pfeifer and Berkman 2018; Reiter et al. 2021), which may facilitate the increasing tendency to resist peer influence from late adolescence to adulthood (Steinberg and Silverberg 1986). To date, most research to examine age-related differences in RPI has been conducted in Western countries, such as the United States and Europe, and the extent to which this developmental trend generalizes across cultures is not fully understood.

1.2 | Peer Influence in the Context of Cultural Differences

In addition to age, cultural factors are also likely to influence people's tendencies to conform to or resist peer influence. Different cultures vary with respect to their prescription to normative behaviors and the extent to which they value interpersonal relationships (Lam 1997; Leung and Iwawaki 1988; Pei et al. 2023). Thus, cultural context may play a significant role in the developmental trajectories of adolescents' RPI. For example, individualism–collectivism (Hofstede et al. 1990) is one of the central dimensions of differences measured among cultures (Greenfield 2000). Collectivistic cultural orientations place higher values on interdependent relationships and groups, and those who espouse this orientation tend to conceptualize themselves within the context of their surroundings and social contexts. On the other hand, individualistic groups view the self as a separate entity unique from others, value independence, and appreciate the importance of asserting and attending to the self (Hofstede et al. 1990). Importantly, adolescents may feel different pressures to conform to peer influence as a function of these two cultural orientations. Indeed, cross-cultural studies on social

conformity indicate that, compared to people from individualistic societies, those from collectivistic societies generally conform more to the opinions and behaviors of their peers, both within samples of adults (Bond and Smith 1996; Riemer et al. 2014) and adolescents (Liu et al. 2017; van de Bongardt et al. 2015). A few exceptions have been noted in which adolescents from collectivistic cultures were found to be more resistant to certain types of peer influence, such as in the context of tobacco use (Unger et al. 2002).

An important question, then, is how cultural context influences the changes in RPI during this developmental period. Adolescents transition from being the recipients of culture to the carriers of culture (Philip Rice and Dolgin 2008). During this transition, adolescents learn about societal expectations and cultural ideals that could facilitate success when they take on an independent role in society. This cultural learning moderates many developmental trajectories, including health behaviors (Piko et al. 2005; Unger et al. 2002), relationship formation (Greenfield and Suzuki 1998), emotional experiences (Park and Kitayama 2018), and self-efficacy beliefs (e.g., regarding school performance; Oettingen and Zosuls 2006). Similarly, cultural values such as individualism and collectivism could influence the developmental trajectories of RPI in adolescence. Adolescents who grow up in individualistic cultures may increasingly value traits such as independence and the promotion of individual goals and may demonstrate an increased tendency to resist peer influence as they enter adulthood. On the other hand, adolescents in collectivistic cultural contexts, in which individuals are more interdependent, ensembled, and communal, could have increased tendencies to conform to peer influence over time.

To our knowledge, no studies have directly examined age-related changes in conformity and RPI in collectivistic societies (such as East Asian cultures), and it is unknown how these cultural characteristics interact with social, psychological, and developmental factors in their effects on individuals' tendencies to resist peer influence. A better understanding of cultural moderators brings both theoretical and practical implications. On a theoretical level, evidence from wider cultural contexts could help inform the extent to which current theories about developmental trajectories of conformity and RPI are culturally specific or universal. On a practical level, insights into the effectiveness of normative messages across diverse age and cultural groups may enhance intervention strategies in areas such as health and sustainability.

1.3 | The Current Studies

The primary goal of this study is to examine age-related differences in RPI in adolescents from two culturally distinct backgrounds: individualistic (the United States) and collectivistic (China). Based on prior studies suggesting adolescents from Western cultures become increasingly resistant to peer influence and evidence that adolescent beliefs and behaviors are influenced by cultural context, we propose two competing hypotheses:

Hypothesis 1. *Increased resistance to peer influence from adolescence to adulthood, previously observed in Western samples, reflects biological processes that are fundamental to human development, and thus is universal across cultural contexts. According to*

this hypothesis, Chinese adolescents will also demonstrate increased resistance to peer influence from adolescence to adulthood (“Culturally invariant hypothesis”).

Hypothesis 2. *As individuals progress through adolescence, their behavioral tendencies to resist peer influence are affected by cultural factors. According to this hypothesis, Chinese adolescents will demonstrate distinct developmental patterns compared to what has been observed in Western samples (“Cultural moderation hypothesis”).*

We conducted two studies to test these competing hypotheses. Both studies included the RPI scale (Steinberg and Monahan 2007) as a self-report measure. Researchers have documented many issues of using only self-report measures in cross-cultural studies. These issues include (1) the reference group effect, where people tend to draw evaluations of their own characteristics from comparison with others (Heine et al. 2002), and (2) in some cases, low correlations between self-report and behavior (Heine, Buchtel, and Norenzayan 2008). Given these considerations, we also included a behavioral measure of conformity (mobile game rating task; Cascio et al. 2015) to complement the RPI self-report scale in both studies. Study 1 explored the developmental patterns for peer influence resistance among 640 Chinese participants aged 15–22 years old. We followed up with a preregistered study (Study 2), where we simultaneously recruited adolescents and young adults between 15 and 25 years old from the United States and China ($n = 690$ Chinese participants and $n = 502$ US participants) and provided a more direct cultural comparison.

2 | Study 1

2.1 | Methods

2.1.1 | Participants

Participants included 640 adolescents and young adults, aged 15–22, from diverse regions in China. Participants were recruited through a Chinese online data-collection company (Idiaoyan) similar to Prolific. Participants were recruited from Idiaoyan’s participant pool and were compensated 10 RMB for participation. The lower age cutoff (15 years) was selected based on the minimum age of participants in the Idiaoyan participant pool. The participants consisted of 48.59% females, with a mean age of 18.50 years ($SD = 2.29$, range: 15–22 years). The number of participants of each gender (male and female) was balanced at each age level (Table 1). Prior to completing study activities, participants provided written consent (for participants ages 18–22) or assent obtained directly from participants (for participants ages 15–17). For participants under 18 years, a waiver for parental consent was obtained prior to data collection from the Institutional Review Board (IRB) at the University of Pennsylvania. All study procedures were approved by the IRB.

2.1.2 | Measures

2.1.2.1 | RPI Scale. The RPI scale (Steinberg and Monahan 2007) assesses general RPI in a variety of situations. The scale consists of 10 items, of which 3 are reverse-coded. Each item

presents two options that are both acceptable choices, such as “(A) Some people would do something that they knew was wrong just to stay on their friends’ good side. (B) Other people would not do something they knew was wrong just to stay on their friends’ good side.” The scale items are presented and phrased in such a way that makes it difficult for participants to recognize “right” or “wrong” answers (Sumter et al. 2009). Participants were asked to indicate to which group of people they belong and the extent to which they belong to this group on a four-point scale (where 1 = A is really true for me, 2 = A is sort of true for me, 3 = B is sort of true for me, and 4 = B is really true for me). Higher ratings in this scale indicate higher tendencies to resist peer influence and lower tendencies to conform to peer pressure. For the purposes of this study, the RPI scale was translated to Chinese by a professional English-to-Chinese translator, and the accuracy of translations in the context of the scale was checked by a bilingual member of the study staff (see Table S1 for the Chinese version of the RPI scale).

2.1.2.2 | Mobile Game Rating Task. To complement the self-reported ratings of RPI, we implemented an online behavioral task to obtain behavioral measures of conformity to peer influence. Before answering questions from the RPI scale, all participants completed a mobile game rating task (Figure 1) adapted from a prior study that examined social influence in American adolescents (Cascio et al. 2015). Similar tasks have been used to study conformity to peer influence in other settings (Braams, Davidow, and Somerville 2018; Foulkes et al. 2018; Klucharev et al. 2009; Knoll et al. 2015; Nook and Zaki 2015; Welborn et al. 2016; Zaki, Schirmer, and Mitchell 2011). The task stimuli consisted of real mobile game app titles, short descriptions, and icons captured from the iTunes App Store. All mobile game stimuli were from only one category (puzzle-based games) to reduce strong preferences for one particular game category (e.g., role-playing vs. battle royale). In addition, all descriptions for mobile games were limited to a two-sentence structure.

Participants were asked to provide two rounds of recommendation ratings for a set of mobile game stimuli. First, participants viewed 24 previously unknown mobile game titles, icons, and descriptions for each game and sequentially rated their recommendation intentions in response to the prompt: “How likely would you be to recommend the game to a friend?” Participants rated their recommendation intentions on a five-point scale (1 = “would not recommend” and 5 = “would recommend”). The 24 games were presented to the participants in random order.

Participants completed questionnaires unrelated to the current study (approximately 10 min in length) between Rounds 1 and 2 of the game app recommendation task. In the second round, participants were informed that they would have the opportunity to update their initial recommendation ratings. Participants were asked to rerate the same 24 mobile game apps in the same order presented in Round 1. This time, participants were shown the titles, icons, and descriptions of each mobile game along with their initial recommendation rating. In addition, participants were shown information about the average rating of their peers (e.g., whether the peers in the same study provided on average higher, lower, or the same ratings compared to the participant). The peer group rating was an experimental manipulation and randomly generated to include eight mobile games in each of

TABLE 1 | Number of Study 1 and Study 2 participants by country, age, and gender.

Age	Study 1			Study 2					
	Chinese sample			US sample			Chinese sample		
	Female	Male	Other	Female	Male	Other	Female	Male	Other
15	28	52	0	23	17	1	30	36	0
16	34	46	0	25	21	3	32	34	0
17	41	39	0	27	23	0	31	35	0
18	40	40	0	23	14	1	28	35	0
19	39	41	0	26	14	1	26	26	0
20	42	38	0	29	21	3	31	28	0
21	46	34	0	25	24	0	31	30	0
22	41	39	0	24	18	0	33	33	0
23	—	—	—	20	21	1	34	28	0
24	—	—	—	29	23	1	36	32	0
25	—	—	—	23	21	0	34	27	0

**FIGURE 1** | Illustration of the mobile game rating task in Chinese (A and B), with an English translation for ease of interpretation (C and D) [Note: only the Chinese version was used in Study 1]. In Round 1 of the task (A and C), participants were shown an icon and a short description of the game and were asked to rate their intention to recommend the game on a five-point scale. In Round 2 of the task (B and D), participants were shown the same information about the game, their rating in Round 1, and additionally, feedback about whether their rating of the same game in Round 1 is higher, lower, or the same as the average rating of their peers.

the three conditions (peer ratings were either higher, lower, or the same as the ratings given by the participant). The current analyses focused on the trials in which participants received peer feedback distinct from their initial rating in Round 1. For this task, conformity was conceptualized as the percentage trials

where participants updated their Round 1 rating in the direction consistent with the peer feedback they received.

2.1.2.3 | Self-Construal Scale (SCS). Participants completed the Chinese version of the self-construal scale (SCS)

(Li et al. 2018; Singelis 1994), which consisted of 24 items assessing individual differences in independence and interdependence tendencies on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). Similar to prior research (Li et al. 2018; Luo et al. 2015; Ma et al. 2012; Steel et al. 2018), a composite self-construal score was computed by subtracting the mean score of the 12 independent self-construal items from that of the 12 interdependent self-construal items, such that a higher score indicates a higher rating in interdependent self-construal and lower rating in independent self-construal. Parallel analyses that separately examined independent and interdependent self-construal are included in the Supporting Information section.

2.1.3 | Internal Consistency of the RPI and Behavioral Conformity

We assessed the internal consistency of the RPI scale and the behavioral measure of conformity in the mobile game rating task. Cronbach's alpha for the full Chinese version of the RPI scale was 0.48, indicating low internal consistency of the scale. The item-total correlations ranged from 0.21 to 0.57. For the item-total correlations, a cut-off score of 0.30 is recommended (Nunnally 1994); items that fall below this cut-off score are best removed from a scale. Three items fell below this cut-off point (Items 2, 6, and 10). When these items were removed from the scale, Cronbach's alpha increased to 0.59. For this reason, we used the average of the seven remaining scale items in the current analyses. In the case of this dataset, binarizing the RPI measure did not meaningfully improve the internal consistency of the RPI scale (see Supporting Information). With regard to the SCS, Cronbach's alpha reliabilities in our sample were 0.63 for the interdependent SCS and 0.62 for the independent SCS. For the behavioral conformity measure from the mobile game rating task, as the peer feedback condition was randomized to each trial (i.e., mobile game), we calculated internal consistency using split-half reliability, which was 0.93 for the conformity measure in the mobile game rating task.

2.1.4 | Analyses

2.1.4.1 | Age-Related Differences in Self-Reported RPI.

We first examined age-related differences in participants' self-reported RPI. To examine linear associations between age and RPI, we constructed an ordinary least squares (OLS) linear regression model in which age was entered as a predictor variable and self-reported RPI was entered as the outcome variable. Given previous reports of gender differences in RPI (Erickson, Crosnoe, and Dornbusch 2000; Prinstein 2007), gender was included as a control variable. Further, as many studies have reported nonlinear age-related changes during adolescence (Nook et al. 2018; Somerville, Jones, and Casey 2010), we also explored the potential nonlinear effect of age by fitting a quadratic OLS, in which age and age² were included as predictor variables, and gender was included as a control variable. Model fit was evaluated using the Akaike information criterion (AIC) with a penalty parameter of $k = 2$ (Bozdogan 1987).

2.1.4.2 | Age-Related Differences in Behavioral Conformity.

We next examined age-related differences in participants'

behavioral conformity in the mobile game rating task. This was tested at trial level using multilevel logistic linear regressions in which age and gender were specified as fixed effects, and the variance between individual participants was included as a random effect, with the intercept allowed to vary. This model allowed us to estimate the linear and quadratic effects of age on behavioral conformity at the trial level while taking into account differences in individuals' baseline tendencies to conform. Similar to RPI, we built two separate models, one focusing on the linear effect of age and one focusing on both the linear and the quadratic effects of age.

2.1.4.3 | Testing the Indirect Effect of Self-Construal. We conducted mediation analyses to test the indirect effect of age on RPI as well as behavioral conformity through self-construal. Two mediation models were fitted using the *lavaan* package in R (Hayes 2009; Rosseel 2012) with RPI and behavioral conformity as the outcome variables, respectively. Each bootstrap mediation model was constructed with 10,000 resamples. The indirect effect ($a \times b$) was tested at a significance α level of 0.05, defined as 95% confidence intervals (CIs) that do not include 0. All tests were two-sided. Note that although the analyses on the effect of age on behavioral conformity were conducted at trial level using multilevel models, for simplicity, mediation analyses on behavioral conformity were conducted at the individual level.

2.1.4.4 | Exploratory Analyses. As part of the exploratory analyses, we examined if individualistic and collectivistic cultural values may change as a function of age across adolescence (see Supporting Information section).

2.2 | Results

2.2.1 | Mobile Game Rating Task

The results from the mobile game rating task indicated that information about peer recommendations (whether peers provided higher, lower, or the same ratings compared to the participants' original ratings) significantly altered the proportion of trials in which participants updated their original recommendations (irrespective of the update direction) after they received peer feedback ($M_{\text{same}} = 15.58\%$, $SD_{\text{same}} = 25.31\%$; $M_{\text{higher}} = 59.18\%$, $SD_{\text{higher}} = 33.72\%$; $M_{\text{lower}} = 60.69\%$, $SD_{\text{lower}} = 33.38\%$). A generalized linear model with a logit link was built to examine whether feedback type influenced the percentage of trials in which participants changed their initial ratings. When comparing trials in which participants received different (higher or lower) versus the same feedback, participants updated their ratings significantly more frequently when peer group ratings differed from the participants' initial ratings versus when peer group ratings were the same as the participants' initial ratings (higher rating vs. same rating: $b = 2.06$, 95% CI = [1.79, 2.33], $p < 0.001$; lower rating vs. same rating: $b = 2.12$, 95% CI = [1.85, 2.39], $p < 0.001$). Percent conformed trials (i.e., the percentage of trials in which participants updated their Round 1 ratings according to peer feedback) were not different between higher versus lower conditions ($t(1275) = -0.48$, $p = 0.63$). Finally, we observed a marginal correlation between the self-reported RPI and the behavioral conformity measure at the individual level ($r(638) = -0.08$, $p = 0.05$).

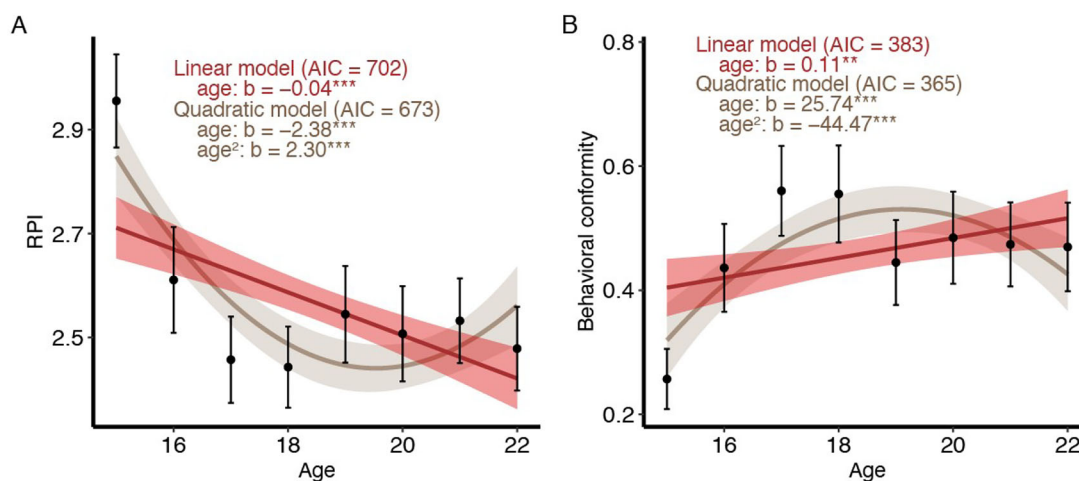


FIGURE 2 | Age differences in (A) the self-reported measure of RPI and (B) the behavioral measure of conformity to normative social influence in Study 1. Higher scores on the RPI measure indicate greater resistance to peer influence. Trajectories indicate linear (red) and quadratic (brown) model fits. The shaded region and error bars indicate 95% confidence interval. AIC, Akaike information criterion.

TABLE 2 | Descriptive statistics of self-reported resistance to peer influence (RPI) and behavioral conformity scores for each age level in Study 1.

Age	Self-reported RPI Mean (SD)	Behavioral conformity Mean% (SD%)
15	2.96 (0.41)	25.69 (22.12)
16	2.61 (0.46)	43.60 (32.28)
17	2.46 (0.38)	56.01 (33.11)
18	2.44 (0.36)	55.50 (33.64)
19	2.54 (0.42)	44.46 (31.17)
20	2.51 (0.42)	48.46 (33.87)
21	2.53 (0.37)	47.38 (30.94)
22	2.48 (0.37)	46.97 (32.62)

2.2.2 | Age-related Differences in Self-Reported RPI

Self-reported RPI scores are summarized in Table 2. Distinct from the developmental trends reported in prior studies in Western adolescents and young adults (Foulkes et al. 2018; Reiter et al. 2021; Steinberg and Monahan 2007; Sumter et al. 2009), linear regression results indicated a general decrease in self-reported RPI across age ($b = -0.04$, $t(637) = -5.64$, 95% CI = $[-0.06, -0.03]$, $p < 0.001$; Figure 2A; Table 3). Within the age range of this study, younger participants reported higher RPI compared to older participants. We then constructed a quadratic model to examine the nonlinear relationship between age and self-reported RPI. Between the linear and quadratic models, self-reported RPI scores were better fitted using the quadratic model ($AIC_{\text{linear}} = 702$, $AIC_{\text{quadratic}} = 673$). We observed significant coefficients for both the linear and quadratic terms (age: $b = -2.38$, $t(636) = -5.81$, 95% CI = $[-3.18, -1.57]$, $p < 0.001$; age²: $b = 2.30$, $t(636) = 5.64$, 95% CI = $[1.50, 3.10]$, $p < 0.001$; Table 3). The fitted quadratic model (Figure 2A) demonstrated a substantial decrease in self-reported RPI between ages 15 and 18 years, followed by a slight increase between 18 and 20 years old, during which time the

RPI ratings were still significantly lower than mean RPI ratings for the adolescent participants at 15 years old (p values < 0.05), suggesting an overall observed decrease in RPI across adolescence and early adulthood.

2.2.3 | Age Differences in Behavioral Conformity

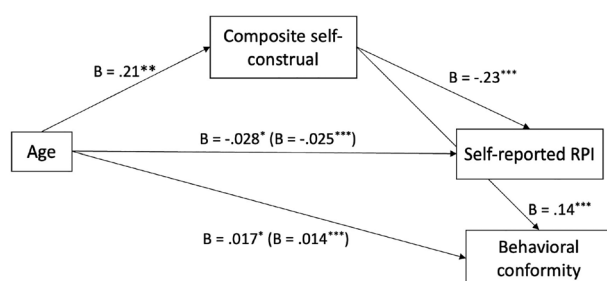
Mean levels of behavioral conformity are also summarized in Table 2. Consistent with findings on self-reported RPI, results from the linear multilevel logistic regression models indicated a general increase in behavioral conformity as a function of age ($b = 0.11$, 95% CI = $[0.03, 0.18]$, $p < 0.01$; Figure 2B; Table 3). In other words, older participants were more likely to conform to peer feedback in the mobile game rating task compared to younger participants. When this linear multilevel logistic regression model was compared with the quadratic model, data were better fitted using the quadratic model ($AIC_{\text{linear}} = 11,145$, $AIC_{\text{quadratic}} = 11,123$; Figure 2B). The quadratic model fit demonstrated a marked increase in behavioral conformity between ages 15 and 18 years, followed by a slight decrease that dipped at around the age of 20, but the behavioral conformity scores remained overall significantly lower than conformity scores earlier in adolescence at age 15 (p values < 0.05).

2.2.4 | Indirect Effects of Self-Conceptual

We then conducted mediation analyses to test whether (1) the relationship between age and self-reported RPI and (2) the relationship between age and behavioral conformity were each mediated by self-construal.¹ The bootstrapping procedure for mediation showed a significant indirect effect of composite self-construal on both self-reported RPI ($b = -0.028$, SE = 0.011, 95% CI = $[-0.071, -0.015]$) and behavioral conformity ($b = 0.017$, SE = 0.008, 95% CI = $[0.001, 0.033]$; Figure 3). The negative coefficient in the first mediation mode indicates that the mediator (composite self-construal) increases as IV (age) increases, but the correlation between the mediator and DV (self-reported RPI) is negative. Controlling for interdependence, age was still a

TABLE 3 | Study 1 model results for the linear and quadratic effects of age on resistance to peer influence (RPI) and behavioral conformity, after controlling for gender.

	RPI		Behavioral conformity	
	Linear model	Quadratic model	Linear model	Quadratic model
Intercept	3.36*** [3.09, 3.63]	2.59*** [2.49, 2.69]	−2.53*** [−3.98, −1.09]	−0.49 [−1.02, 0.05]
Age	−0.04*** [−0.06, −0.03]	−2.38*** [−3.18, −1.57]	0.11** [0.03, 0.18]	25.74*** [12.40, 39.08]
Age ²		2.30*** [1.50, 3.10]		−44.47*** [−54.86, −34.07]
Gender	−0.03 [−0.09, 0.04]	−0.02 [−0.08, 0.05]	0.24 [−0.11, 0.59]	0.19 [−0.15, 0.53]
N _{observations}	640	640	10,603	10,603
N _{participants}	640	640	640	640
AIC	702	673	11,145	11,123

* $p < 0.05$.** $p < 0.01$.*** $p < 0.001$.**FIGURE 3** | Standardized regression coefficients for the relationship between age and resistance to peer influence measures (self-reported RPI and behavioral conformity) as mediated by composite self-construal in Study 1. Values in parentheses indicate the standardized regression coefficient between age and the outcome variable, controlling for interdependent composite self-construal. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

significant predictor for self-reported RPI ($b = -0.025$, $t(636) = -5.04$, $p < 0.001$) and behavioral conformity ($b = 0.014$, $t(636) = 3.55$, $p < 0.01$). Results demonstrate that the relationships between age and RPI as well as behavioral conformity are partially mediated by self-construal, such that increases in age are associated with greater interdependence and less independence, which in turn predicts lower RPI and higher conformity.

2.3 | Conclusion

In summary, in contrast to previous studies that found increased RPI from late adolescence to early adulthood in adolescents from Western cultures, results from Study 1 provided consistent self-report and behavioral evidence that adolescents from an East Asian culture (China) tend to become less resistant to peer influence and more apt to conform to peer behavior as they approach

adulthood. These initial findings challenge prior understanding that increased RPI from adolescence to adulthood reflects a culturally invariant developmental trait. Instead, our results suggest that the developmental trajectory of RPI may depend on cultural context, reflecting culturally relevant developmental goals.

3 | Study 2

Study 1 provides initial evidence that people in a collectivistic culture may demonstrate distinct developmental patterns of RPI during adolescence from those presented in individualistic cultures. However, Study 1 has several limits: The cultural inference depends on comparing these results with findings from previous studies, and the age range (15–22 years old) limits our ability to capture the developmental trajectory in early adulthood. Study 2 aimed to replicate Study 1 findings in a new sample of Chinese adolescents and young adults. Additionally, to add a direct cross-cultural comparison, we simultaneously recruited participants from an individualistic culture (the United States) and from a collectivistic culture (China). Finally, Study 2 recruited a wider age range (up to 25 years old) to better capture these age differences in RPI in young adults.

3.1 | Methods

3.1.1 | Participants

We concurrently recruited 833 Chinese and 1077 US participants between April and May 2019. All participants were between the ages of 15 and 25 years old. As in Study 1, the Chinese sample was recruited through Idiaoyan, an online survey sample company based in China. The US sample was recruited through Toluna, an online survey sample company based in the United

States. The lower age cutoff (15 years) was selected based on the minimum age of participants in the Idiaoyan participant pool. Participants in both samples were asked to provide written consent (for participants of 18 years and older) or assent (for participants under 18 years old) in accordance with the IRB at the University of Pennsylvania and were compensated for their participation (China: 10 RMB; the United States: 3 USD). Prior to data collection, we obtained a waiver for parental consent from the same ethics review board for participants under 18 years. According to our preregistered exclusion criteria (detailed below), 143 Chinese participants and 575 US participants were excluded, resulting in 690 Chinese participants and 502 US participants included in the current analyses (Table 1). Note that, as outlined in the preregistration, we also conducted parallel analyses without participant exclusion, which produced results that were not substantively different from the main models (see the Supporting Information section).

3.1.2 | Measures

The measures assessed in Study 1 (demographics, RPI, self-construal, and the mobile game rating task) were also assessed in Study 2. The RPI scale did not achieve high internal consistency in Study 1 (Cronbach's $\alpha = 0.48$), suggesting that the questions included in the Chinese version of the RPI scale may not be well adapted for the Chinese culture. As such, we updated the Chinese version of the RPI scale in accordance with the scale translated by another research team (Table S1). Cronbach's α for the RPI scale in the Chinese sample was 0.70, and Cronbach's α for the US sample was 0.69. This indicates that RPI achieved acceptable internal consistency in both the Chinese and US samples.

We also included several measures that may capture relevant differences between the US and the Chinese participants other than cultural self-construal. These measures include the frequency of mobile game play, the number of siblings, and the number of friends. Mobile game play frequency was measured using one item: "How often do you play mobile games?", to which participants answered on a four-point scale ("More than three times per day," "Once or twice per day," "Two to three times per week," and "Not very frequently"). For siblings, we asked participants to report the number of their brothers, sisters, and siblings that do not identify as male or female. The total number of siblings was calculated as a sum of answers to these questions. Finally, we asked participants to report the number of close friends they have.

3.1.3 | Data Exclusion Criteria

Participants were excluded based on the preregistered criteria² listed below. As stated in the preregistration, we also examined parallel analyses without participant exclusion to investigate if the results were qualitatively different (Supporting Information). Participants were excluded if:

1. they were outside the eligible age range (between 15 and 25 years; $n = 0$);

2. they failed to correctly answer two out of the three attention check questions included in the survey ($n = 348$);
3. for participants recruited in the United States: if they were of East Asian ethnicity ($n = 0$);
4. for participants recruited in the United States: if they were not a US citizen ($n = 0$);
5. for participants recruited in China: if they were not of Han ethnicity³ ($n = 0$);
6. for participants recruited in China: if they were not a Chinese citizen ($n = 0$);
7. they failed to answer all questions in the RPI scale ($n = 0$);
8. they failed to complete 80% of all the questions included in the survey ($n = 0$);
9. they demonstrated low variability in the mobile game rating task. Specifically, if they provided the same response for four or more consecutive questions in the app rating task ($n = 323$);
10. their self-reported RPI measure was greater than or equal to 2 standard deviations from the mean of their respective cultural group sample (United States or China; $n = 47$);
11. their behavioral RPI measure from the mobile game rating task was greater than or equal to 2 standard deviations from the mean of their respective cultural group sample (United States or China; $n = 0$).

3.1.4 | Analyses and Hypotheses

Based on preliminary results from Study 1, we hypothesized that differences in country would moderate the effects of age on individuals' tendencies to resist or conform to peer influence. Analyses were preregistered on Open Science Framework; see Table S2 for an outline of all preregistered hypotheses, whether they are supported, and their locations. Below, we detail the preregistered hypotheses and analyses that are related to cultural effects on people's responses to social influence, which is the focus of this current work.

3.1.4.1 | Main Effect of Country on RPI and Behavioral Conformity. We first examined if there were differences in self-reported RPI and behavioral conformity measured through the mobile game rating task between the US and Chinese samples. For each outcome measure, we tested the main effect of country using multiple OLS linear regressions in which the outcome measure was specified as the outcome variable and country, age, and gender were specified as predictor variables. For these and all following analyses that included country as a predictor, country was treated as a dichotomous factor variable, with the United States as the reference level.

3.1.4.2 | Main Effects of Age on RPI and Behavioral Conformity in Each Country. We separately examined the linear and nonlinear effects of age on self-reported RPI and behavioral conformity in each country (China and the United States). For RPI, the effect of age was examined using OLS models in which the RPI was specified as the outcome variable, and age, age² (only

for quadratic models), and gender were the predictor variables in the US and the Chinese samples, separately. For behavioral conformity, the effect of age was examined using multilevel logistic regressions in which age, age² (only for quadratic models), and gender were specified as fixed effects, and the variance between individual participants was included as a random effect, with the intercept allowed to vary.

3.1.4.3 | Interaction Effects of Age and Country on RPI and Conformity. We also examined the interaction effects of age and country on RPI and behavioral conformity. Similar to analyses on the main effect of age, the interaction effect of age and country was tested using an OLS model for RPI and a multilevel logistic model for behavioral conformity.

3.1.4.4 | Testing the Indirect Effect of Self-Construal. We conducted mediation analyses to test the indirect effect of age on RPI as well as behavioral conformity through self-construal in each country. Analytical procedures were identical to mediation models specified in Study 1.

3.2 | Results

3.2.1 | Mobile Game Rating Task

Consistent with Study 1, peer recommendations significantly altered the participants' choice to update their original recommendations (proportions of recommendation updates: $M_{\text{same}} = 17.91\%$, $SD_{\text{same}} = 27.43\%$; $M_{\text{higher}} = 50.75\%$, $SD_{\text{higher}} = 36.68\%$; $M_{\text{lower}} = 56.46\%$, $SD_{\text{lower}} = 35.31\%$). When comparing trials in which participants received different (higher or lower) versus the same feedback, multilevel logistic model results showed that participants updated their ratings significantly more frequently when peer group ratings differed from the participants' initial ratings versus when peer group ratings were the same as the participants' initial ratings (higher rating vs. same rating: $b = 2.25$, 95% CI = [2.17, 2.34], $p < 0.001$; lower rating vs. same rating: $b = 2.63$, 95% CI = [2.54, 2.71], $p < 0.001$). Unlike Study 1, participants in Study 2 updated their recommendations significantly more frequently when the peer feedback was lower than participants' Round 1 ratings compared to when the peer feedback was higher ($t(2377.7) = -3.87$, $p < 0.001$). Finally, we observed a significant negative correlation between the self-reported RPI and the behavioral conformity measure at the individual level ($r(1190) = -0.17$, $p < 0.001$). See the Supporting Information section for exploratory analyses that investigate potential reasons for stronger correlation between RPI and behavioral conformity in Study 2.

3.2.2 | Main Effects of Country on Self-Reported RPI and Behavioral Conformity

We first examined the main effect of country on participants' self-reported resistance to peer influence using the RPI scale and behavioral conformity in the mobile game rating task. First, we observed no significant differences in self-reported RPI between the Chinese and the US participants ($b = -0.03$, 95% CI = [-0.07, 0.02], $p = 0.30$). Regarding behavioral conformity, consistent with our preregistered hypothesis, we observed a

significant effect of country on behavioral conformity ($b = 0.05$, 95% CI = [0.01, 0.09], $p = 0.01$), such that the Chinese participants conformed more frequently to peer feedback compared to the US participants.

3.2.3 | Main Effects of Age on Self-Reported and Behavioral Conformity in Each Country

We next investigated the effect of age on self-reported RPI and behavioral conformity in each country (the United States and China). Mean levels of RPI and behavioral conformity at each age level by country are summarized in Table 4. First, regarding the linear effect of the self-reported RPI measure, we found a significant positive linear association between age and RPI among the US participants ($b = 0.02$, $t(498) = 2.85$, 95% CI = [0.01, 0.03], $p < 0.001$; Figure 4B; Table 5). Consistent with prior literature in Western adolescents (Foulkes et al. 2018; Reiter et al. 2021; Steinberg and Monahan 2007; Sumter et al. 2009) as well as our preregistered hypothesis, the US participants reported higher levels of RPI with increased age. Conversely, we did not observe a significant linear association between age and RPI among the Chinese participants ($b = 0.001$, $t(687) = 0.19$, 95% CI = [-0.01, 0.01], $p = 0.85$; Figure 4C). This finding did not replicate our results in Study 1. When including participants within the same age range as Study 1 (15–22 years), we observed no significant correlation between age and RPI in the US participants (the United States: $b = 0.01$, 95% CI = [-0.01, 0.04], $p = 0.21$) and observed a marginal linear effect of age on RPI in the Chinese participants in the predicted direction ($b = -0.01$, 95% CI = [-0.03, 0.00], $p = 0.05$).

We also investigated the potential nonlinear effects of age on RPI. When both models (linear and quadratic) were compared, the effects of age on RPI were better fitted using a linear model in the US sample ($AIC_{\text{linear}} = 696.5$, $AIC_{\text{quadratic}} = 697.8$) and a quadratic model in the Chinese sample ($AIC_{\text{linear}} = 589.2$, $AIC_{\text{quadratic}} = 580.5$). These findings indicated that although the US participants demonstrated a steady increase in behavioral conformity as they approached adulthood, the trajectory in the Chinese participants was nonlinear.

Next, we examined the effect of age on behavioral conformity in the mobile game rating task in participants from each country. As preregistered, we found a significant linear relation between age and conformity among the US participants in the multilevel logistic model ($b = -0.08$, 95% CI = [-0.14, -0.03], $p = 0.002$; Figure 4E), such that conformity to peer feedback significantly decreased as a function of age for the US participants. On the other hand, a marginally positive relation between age and conformity was observed among the Chinese participants ($b = 0.05$, 95% CI = [-0.01, 0.12], $p = 0.06$; Figure 4F).⁴ Of note, when including participants within the same age range as in Study 1 (15–22 years), significant linear effects in opposite directions were observed for both the US and Chinese participants in the predicted directions (the United States: $b = -0.10$, 95% CI = [-0.20, -0.01], $p = 0.019$; China: $b = 0.33$, 95% CI = [0.23, 0.43], $p < 0.001$).

We further investigated the potential nonlinear effects of age on behavioral conformity. Similar to results pertaining to the

TABLE 4 | Descriptive statistics of self-reported resistance to peer influence (RPI) and behavioral conformity scores for each age level and each country in Study 2.

Age	Self-reported RPI Mean (SD)		Behavioral conformity Mean% (SD%)	
	China	United States	China	United States
15	2.84 (0.50)	2.81 (0.35)	45.45 (35.94)	27.21 (23.45)
16	2.65 (0.47)	2.86 (0.42)	48.29 (31.98)	38.60 (34.49)
17	2.81 (0.46)	2.86 (0.39)	45.86 (28.80)	43.44 (37.65)
18	2.70 (0.47)	2.70 (0.39)	44.18 (32.90)	40.24 (34.89)
19	2.73 (0.46)	2.74 (0.33)	47.37 (27.92)	59.34 (32.83)
20	2.80 (0.52)	2.68 (0.31)	44.30 (32.83)	58.21 (34.76)
21	2.87 (0.47)	2.72 (0.35)	29.22 (24.12)	60.32 (34.87)
22	2.85 (0.53)	2.82 (0.31)	39.51 (32.66)	56.07 (34.91)
23	2.92 (0.38)	2.81 (0.34)	42.53 (29.54)	56.81 (35.69)
24	2.92 (0.48)	2.81 (0.36)	31.56 (28.40)	40.92 (31.70)
25	2.89 (0.53)	2.87 (0.45)	38.19 (28.28)	28.15 (31.03)

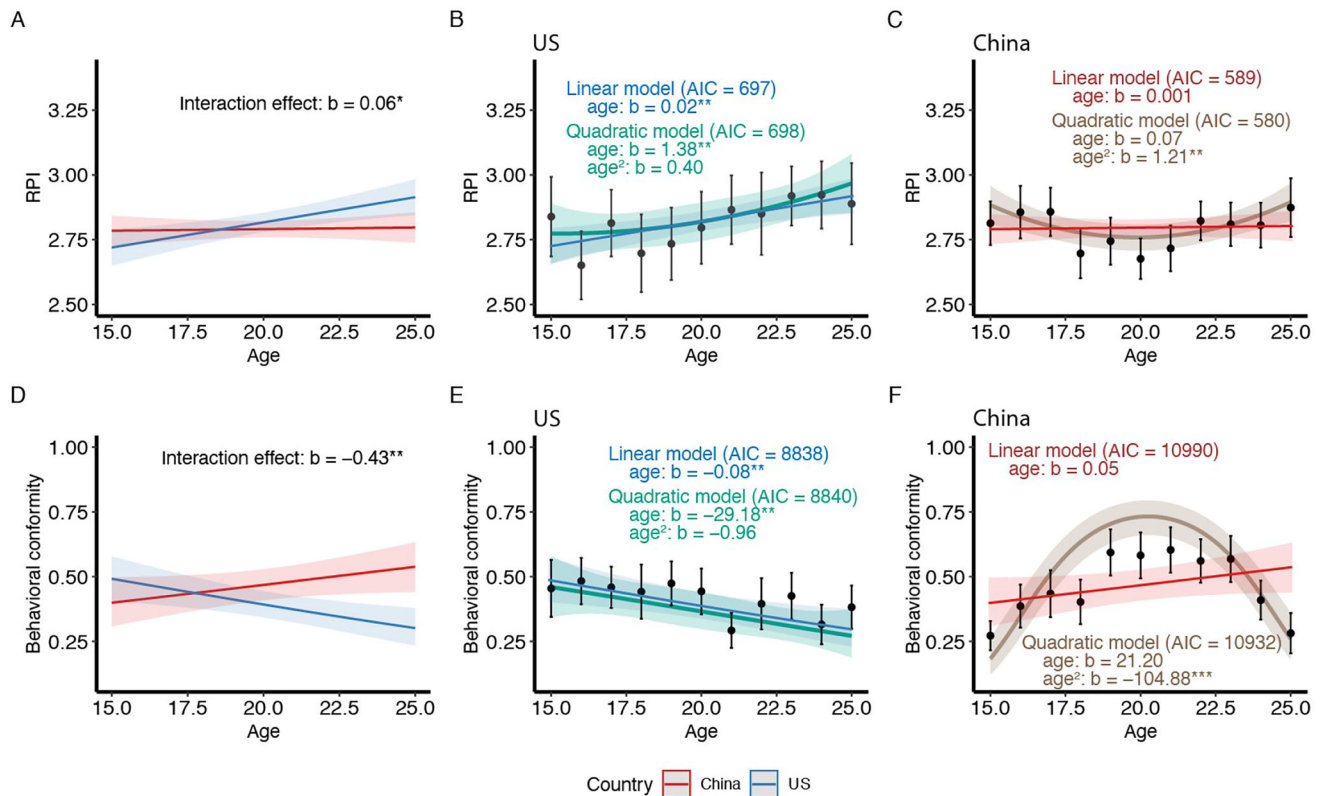


FIGURE 4 | Study 2 differences in RPI and behavioral conformity by country and age. (A and D) Interaction effect of country and age on self-reported RPI and behavioral conformity; (B and C) linear and quadratic models of age differences in RPI in each country; (E and F) linear and quadratic models of age differences in behavioral conformity in each country. Higher scores on the RPI measure indicate greater resistance to peer influence or less self-reported conformity. The shaded areas and error bars indicate 95% confidence interval. AIC, Akaike information criterion.

RPI measure, when both models (linear and quadratic) were compared, the effects of age on behavioral conformity were better fitted using a linear model in the US sample ($AIC_{\text{linear}} = 8837.6$, $AIC_{\text{quadratic}} = 8840.0$) and a quadratic model in the Chinese sample ($AIC_{\text{linear}} = 10,990.5$, $AIC_{\text{quadratic}} = 10,931.8$). These find-

ings indicated that although the US participants demonstrated a steady decrease in behavioral conformity as they approached adulthood, the trajectory in Chinese participants was nonlinear (inverse-U-shaped), with a peak in behavioral conformity at 20 years old.

TABLE 5 | Study 2 model results for the linear and quadratic effects of age on resistance to peer influence (RP) and behavioral conformity in each country, after controlling for gender.

	RPI					
	United States			China		
	Linear model	Quadratic model		Linear model	Quadratic model	
Behavioral conformity						
United States			China			
	Linear model	Quadratic model		Linear model	Quadratic model	Quadratic model
(Intercept)	2.45*** [2.18, 2.72]	2.84*** [2.78, 2.90]		2.80*** [2.62, 2.97]	2.81*** [2.77, 2.85]	0.06 [−0.21, 0.34]
Age	0.02** [0.01, 0.03]	1.38*** [0.43, 2.32]		0.001 [−0.01, 0.01]	0.07 [−0.65, 0.79]	21.20 [1.36, 43.76]
Age ²		0.40 [−0.55, 1.35]			1.21** [0.48, 1.93]	−104.88*** [−128.63, −81.13]
Gender (reference: female)						
Male	−0.05 [−0.13, 0.04]	−0.05 [−0.13, 0.04]		−0.04 [−0.10, 0.01]	−0.04 [−0.10, 0.01]	−0.64** [−1.04, −0.25]
Other	−0.10 [−0.39, 0.19]	−0.10 [−0.39, 0.19]			0.57 [−0.62, 1.77]	
N _{observations}	502	502		690	690	11,495
N _{participants}	502	502		690	690	690
AIC	696.5	697.8		589.2	580.5	10,931.8

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

Finally, we examined whether some factors other than country may account for the observed differences in the developmental trajectories among participants from the two countries. As results from the main analyses suggested a significant interaction effect of country and age on RPI and behavioral conformity, we investigated whether these interaction effects held after controlling for hypothesized confounding variables. For both outcome variables (RPI and behavioral conformity), the interaction effect of age and country remained statistically significant after controlling for the interaction effect between age and mobile game frequency, age and number of siblings, as well as age and the number of close friends (p 's < 0.05; Table 6). This result indicated that country moderated the relation between age and RPI as well as conformity after controlling for these potential confounding factors.

3.2.4 | Interaction Effects of Age and Country on RPI and Conformity

We next examined the interaction effect of age and country on RPI and behavioral conformity. First, with regard to self-reported RPI, as preregistered, we observed a significant interaction between age and country on RPI ($b = 0.06$, $t(1184) = 2.39$, 95% CI = [0.011, 0.108], $p = 0.02$; Figure 4A). This interaction suggests that the relationship between age and RPI varies in the US versus Chinese participants. Specifically, as age increases, we observed higher levels of RPI in the US participants (simple slope $b = 0.02$, 95% CI = [0.01, 0.03], $p < 0.001$), but not among the Chinese participants (simple slope $b = 0.002$, 95% CI = [−0.01, 0.01], $p = 0.85$). Second, with regard to the behavioral conformity measure in the mobile game rating task, results from the multilevel logistic model also indicated a significant interaction between age and country on conformity ($b = -0.43$, 95% CI = [−0.699, −0.165], $p < 0.01$; Figure 4D). This finding was consistent with our preregistered hypothesis. Specifically, we observed lower levels of conformity in the US participants as a function of age (simple slope $b = -0.01$, 95% CI = [−0.02, −0.005], $p = 0.002$) but marginal positive association between age and conformity in the Chinese participants (simple slope $b = 0.01$, 95% CI = [0.00, 0.02], $p = 0.06$). These results provide consistent evidence that the age differences in RPI and behavioral conformity depend on cultural contexts.

3.2.5 | Indirect Effects of Self-Construct

We examined whether composite self-construct significantly mediated the relation between age and conformity in participants from each country. As outlined in the preregistration, we hypothesized that self-construct would mediate the effect of age on RPI as well as conformity in each country. With regard to RPI, our results indicated that the composite self-construct measure significantly mediated the effect of age on RPI in the US participants (indirect effect: $b = -0.09$, 95% CI = [0.04, 0.14], $p = 0.004$; Figure 5A) but not in the Chinese participants (indirect effect: $b = 0.001$, 95% CI = [−0.035, 0.037], $p = 0.97$; Figure 5B). When only participants between 15 and 22 years were included, the composite self-construct measure significantly mediated the effect of age on behavioral conformity in Chinese participants ($b = -0.07$, 95% CI = [−0.12, −0.02], $p = 0.02$).

With regard to behavioral conformity, our results indicated that the composite self-construct measure significantly mediated the effect of age on conformity in the US participants (indirect effect: $b = -0.02$, 95% CI = [−0.04, −0.003], $p = 0.037$; Figure 5A), but not in the Chinese participants (indirect effect: $b = -0.001$, 95% CI = [−0.02, 0.02], $p = 0.95$; Figure 5B). When only participants between 15 and 22 years were included, the composite self-construct measure significantly mediated the effect of age on behavioral conformity in Chinese participants ($b = 0.03$, 95% CI = [0.01, 0.07], $p = 0.01$).

3.3 | Conclusion

Findings from Study 2 indicated distinct developmental trajectories of conformity to normative peer influence in adolescents and young adults from the United States and China. Our findings from the US sample replicated prior studies that reported increasing RPI from late adolescence to early adulthood. Findings from this study provide consistent self-report and behavioral evidence that adolescents from an East Asian culture (China) differ in their RPI at different ages compared to what has been observed in the US and European participants. Culture significantly moderated the effect of age on RPI, indicating that age patterns of peer influence effects depend on cultural contexts. Together, these findings challenge prior understanding that increased RPI from adolescence to adulthood is a culturally invariant trait during this developmental stage.

4 | Discussion

Normative social influence is a widespread and powerful force that significantly shapes behavior. Social norms play a particularly important role for adolescents, as their main social environment largely shifts from parents to peers. The present studies examined age patterns in conformity to normative peer influence in two countries (the United States and China). Prior studies on the developmental trajectory of peer influence have reported an overall increase in the tendencies to resist peer influence from adolescence to adulthood (Reiter et al. 2021; Steinberg and Monahan 2007; Sumter et al. 2009; Walker and Andrade 1996). This increase in RPI is thought to represent adolescents' increase in autonomy as they learn to play a more independent role in society (Braams, Davidow, and Somerville 2018; Steinberg and Monahan 2007; Sumter et al. 2009). Results from this study indicate that cultural context moderates the association between age and RPI in adolescents and young adults between the ages of 15 and 25. These findings supported the Cultural Moderation Hypothesis, which states that cultural contexts may influence the developmental trajectory of RPI during adolescence through cultural learning. The observed distinct developmental trajectories of RPI may reflect culturally relevant developmental goals. In the United States, these goals may include fostering individualism, leading adolescents to increasingly resist peer influence as they grow older, and prioritizing personal choice and self-expression (Steinberg and Silverberg 1986). In contrast, in China, developmental goals may emphasize collectivism and social harmony, resulting in stable or decreasing RPI with age as maintaining group cohesion and conforming to social expectations become more important.

TABLE 6 | Robustness checks that investigated the interaction effect of age and country on independent self-construal and behavioral conformity, after controlling for the interaction effect of age and mobile game frequency (1 and 4), the interaction effect of age and number of siblings (2 and 5), and the interaction effect of age and number of friends (3 and 6).

	Self-reported RPI			Behavioral conformity		
	1	2	3	4	5	6
(Intercept)	5.16*** [4.10, 6.22]	5.25*** [4.86, 5.63]	5.09*** [4.63, 5.55]	0.73 [−2.54, 4.00]	−1.23* [−2.42, −0.05]	−1.26 [−2.68, 0.17]
Age	−0.02 [−0.07, 0.03]	−0.02* [−0.04, −0.001]	−0.01 [−0.04, 0.01]	−0.07 [−0.23, 0.09]	0.05 [−0.00, 0.11]	0.06 [−0.01, 0.13]
Country (reference level: China)	−1.34** [−1.91, −0.77]	−1.34* [−1.99, −0.68]	−1.34** [−1.90, −0.77]	2.40** [0.65, 4.16]	1.86 [−0.16, 3.88]	2.24* [0.51, 3.98]
Mobile game frequency	0.03 [−0.30, 0.35]			−0.63 [−1.62, 0.37]		
Gender (reference level: female)						
Male	0.11* [0.02, 0.20]	0.11* [0.03, 0.20]	0.11* [0.02, 0.19]	−0.36** [−0.64, −0.09]	−0.33* [−0.61, −0.06]	−0.31* [−0.58, −0.04]
Other	−0.64** [−1.10, −0.18]	−0.65** [−1.11, −0.19]	−0.64* [−1.10, −0.19]	0.48 [−0.92, 1.88]	0.51 [−0.89, 1.90]	0.50 [−0.90, 1.90]
Age × Country	0.06** [0.04, 0.09]	0.06*** [0.03, 0.10]	0.06*** [0.04, 0.09]	−0.14** [−0.22, −0.05]	−0.12* [−0.22, −0.02]	−0.13** [−0.22, −0.05]
Age × mobile game frequency	−0.001 [−0.02, 0.02]			0.04 [−0.01, 0.09]		
Siblings		−0.003 [−0.19, 0.19]			0.24 [−0.35, 0.82]	
Age × siblings		−0.0003 [−0.01, 0.009]			−0.01 [−0.03, 0.02]	
Friends			0.04 [−0.03, 0.10]			0.03 [−0.17, 0.22]
Age × friends			−0.001 [−0.004, 0.002]			0.00 [−0.01, 0.01]
R ²	0.04	0.04	0.04	0.02	0.02	0.01
AIC	2743.4	2743.1	2724.1	19,906.0	19,904.8	19,758.1

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

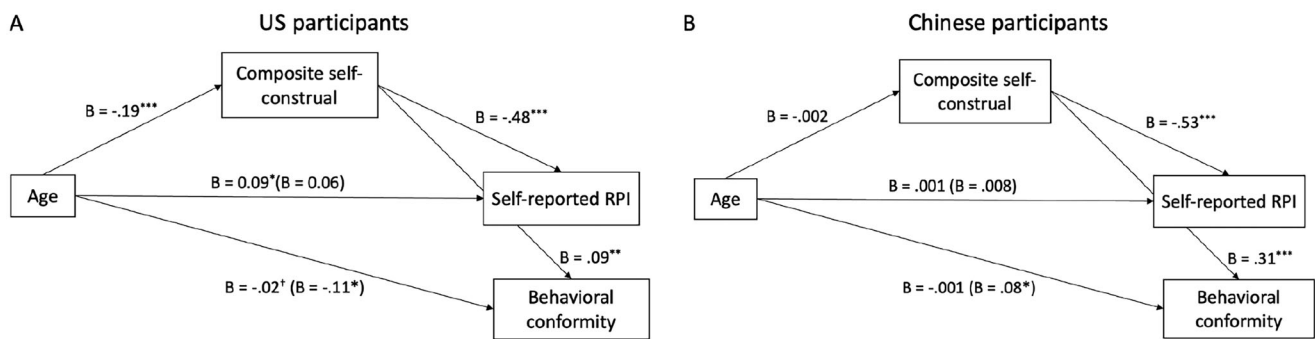


FIGURE 5 | Standardized regression coefficients for the relationship between age and resistance to peer influence measures (self-reported RPI and behavioral conformity) as mediated by composite self-construal in (A) the United States and (B) Chinese participants in Study 2. Values in parentheses indicate the standardized regression coefficient between age and the outcome variable, controlling for interdependent self-construal. $+p < 0.1$; $*p < 0.05$; $**p < 0.01$; $***p < 0.001$.

Results from the current study provided consistent self-report and behavioral evidence that the developmental trajectories of RPI during adolescence may depend on cultural background. Our findings from the US sample replicated prior studies that reported increasing RPI from late adolescence to early adulthood (Braams, Davidow, and Somerville 2018; Foulkes et al. 2018; Knoll et al. 2015, 2017; Steinberg and Monahan 2007; Sumter et al. 2009), theorizing it to be a result of adolescents developing their adult levels of autonomy and independence (Braams, Davidow, and Somerville 2018; Knoll et al. 2015; Steinberg and Monahan 2007). On the other hand, results from Studies 1 and 2 provided evidence that adolescents from an East Asian culture (China) may increase in their tendencies to conform to peer influence in late adolescence (15–22 years). Although speculative, the observed differences might be influenced by cultural factors, suggesting a potential avenue for future research to explore how cultural learning impacts developmental trajectories of peer influence. The current work adds to a growing line of literature that examines key developmental trajectories across different cultures (Duell et al. 2018; Lansford et al. 2020; Rothenberg et al. 2020) and provides the first piece of evidence that the developmental trajectory of RPI during adolescence may depend on cultural context. Together, these findings challenge prior understanding that increased RPI from adolescence to adulthood reflects a fundamental aspect of human development (Steinberg and Monahan 2007).

We observed a significant, positive linear association between age and conformity in Chinese participants between 15 and 22 years old in both Studies 1 and 2. In Study 2, this association did not hold as significant when the age range was widened to 15–25 years. Exploratory nonlinear analyses suggested a potential nonlinear association between age and conformity in Chinese participants between 15 and 25 years old, with conformity peaking at about 20 years. One possibility for this finding is the emphasis on collectivism in Chinese middle and high school education and Chinese parenting. Collectivism is an important component of the Chinese traditional value system (Bush and Haiyan 2000), and education plays an important role in cultural transmission (e.g., Imada 2012; Korbin 2011; Martin 2006). Family climate and parenting practices are significant mechanisms in the familial transmission of core cultural values (Roest et al. 2009; White and Matawie 2004). It is possible that the education system

and parenting play a significant role in Chinese adolescents' cultural learning before they learn to be independent members of society, and that other forces such as individual autonomy may be more powerful after leaving home. Our data cannot speak to this directly, and further research is needed to examine the mechanisms underlying these culturally distinct developmental patterns.

In addition, peer influence has been identified as an important determinant for health, prosocial, and delinquent behaviors (Nash, McQueen, and Bray 2005; van Hoorn et al. 2016) and has often been used in health and safety promotion interventions (e.g., Dillard, Shen, and Vail 2007; Larimer and Neighbors 2003; Ravis and Sheeran 2003). Although these intervention studies have primarily been conducted with US and European participants, there is increasing interest in using peer norms in health promotion campaigns in developing countries (Cislaghi and Heise 2018; Miller and Prentice 2016; Mollen, Rimal, and Lapinski 2010; Nyborg et al. 2016). Findings from the current study can inform social norm interventions targeting people from non-Western backgrounds.

The current study includes two large-scale samples that involve data from adolescents and young adults in the United States and China. In addition, we include data from both self-reported RPI and behavioral conformity. Using a behavioral task allows us to minimize contextual confounds such as cultural meanings, mitigate the reference group effect (i.e., giving ratings to questions based on different levels of cultural baselines), and complement the self-report RPI scale, which has poor internal consistency in Chinese participants. Using a behavioral task may also provide other researchers with documented behavioral measures for use in future studies. Our data should also be interpreted in the context of its limitations. In the current study, we focused on two countries (the United States and China), which limited our ability to infer whether the observed differences between the two countries are specifically due to the individualism–collectivism differences or some other factors distinguishing the two cultures. We conducted indirect effect analyses to mitigate this concern. Future research is needed to explore if similar patterns appear in other Western and non-Western cultures. In addition, due to the cross-sectional nature of our data, we cannot rule out that the observed patterns may be due to generation effects instead of age.

It could be that young people in China are more influenced by globalization (Liu and Wang 2009) and thus more resistant to peer influence. Future works using longitudinal designs are needed to clarify the roles of age and generation.

5 | Conclusion

Taken together, results from this cross-national study indicated distinct developmental trajectories of conformity to normative peer influence in adolescents and young adults from the United States and China. Our findings from the US sample replicated prior studies that reported increasing RPI from late adolescence to early adulthood. In comparison, findings from this study provide consistent self-report and behavioral evidence that adolescents from an East Asian culture (China) differ from those in the United States and Europe with respect to their tendencies to resist peer influence. Culture significantly moderated the effect of age on RPI. These findings challenge prior understanding that increased RPI from adolescence to adulthood reflects a core aspect of human growth. Our results suggest that the developmental trajectory of RPI may depend on cultural context, reflecting culturally relevant developmental goals. Depending on the cultural context in which adolescents are situated, they are more or less likely to resist peer influence with age. As peer influence is a significant determinant of various health, social, and delinquent behaviors, identifying the factors that shape the developmental trajectories of RPI contributes to our understanding of adolescent psychosocial development, and provides broad implications for health, education, and policies aimed at adolescents from different cultural contexts.

5.1 | Citation Diversity Statement

Recent work in several fields of science has identified a bias in citation practices such that papers from women and other minority scholars are under-cited relative to the number of such papers in the field. Here we sought to proactively consider choosing references that reflect the diversity of the field in thought, form of contribution, gender, race, ethnicity, and other factors. First, we obtained the predicted gender of the first and last author of each reference by using databases that store the probability of a first name being carried by a woman. By this measure and excluding self-citations to the first and last authors of our current paper, our references contain 33.51% woman (first)/woman (last), 16.96% man/woman, 23.33% woman/man, and 26.2% man/man. This method is limited in that (a) names, pronouns, and social media profiles used to construct the databases may not, in every case, be indicative of gender identity, and (b) it cannot account for intersex, non-binary, or transgender people. Second, we obtained the predicted racial/ethnic category of the first and last authors of each reference by databases that store the probability of the first and last names being carried by an author of color. By this measure (and excluding self-citations), our references contain 5.21% author of color (first)/author of color (last), 11.98% white author/author of color, 9.25% author of color/white author, and 73.57% white author/white author. This method is limited in that (a) names and Florida Voter Data to make the predictions may not be indicative of racial/ethnic identity, and (b) it cannot account for Indigenous and mixed-race authors or those who

may face differential biases due to the ambiguous racialization or ethnicization of their names. We look forward to future work that could help us better understand how to support equitable practices in science.

Author Contributions

Rui Pei, Elissa Kranzler, and Emily B. Falk: conceptualization, methodology, and writing. **Rui Pei and Emily B. Falk:** analyses and funding acquisition.

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Ethics Statement

Ethical approval for this work was obtained from the Institutional Review Board at the University of Pennsylvania.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Positionality Statement

Acknowledging that the authors' identities can influence the approach to science, we wish to provide the reader with information about our backgrounds. All authors were identified as female. With regard to race, one author identified as East Asian, and two authors identified as white.

Endnotes

¹ In the main manuscript, we used a composite self-construal measure of interdependence versus independence. See the Supporting Information section for analyses that separately examine interdependence and independence.

² Preregistration: <https://osf.io/7wx5e>.

³ The Chinese population includes diverse ethnic groups. For this study, we only recruited Chinese participants that are of Han ethnicity, which constitutes 92% of the Chinese population and tends to be higher in collective orientation (Ma, Xu, and Xu 2016; Wang, Zhao, and Chen 2018).

⁴ Note that a significant positive association between age and behavioral conformity was observed in the larger Chinese sample without participant exclusion (see the Supporting Information section for details).

References

- Bond, R., and P. B. Smith. 1996. "Culture and Conformity: A Meta-Analysis of Studies Using Asch's (1952b, 1956) Line Judgment Task." *Psychological Bulletin* 119, no. 1: 111–137. <http://doi.apa.org/journals/bul/119/1/111.html>.
- Bozdogan, H. 1987. "Model Selection and Akaike's Information Criterion (AIC): The General Theory and Its Analytical Extensions." *Psychometrika* 52, no. 3: 345–370. <https://doi.org/10.1007/BF02294361>.

- Braams, B. R., J. Y. Davidow, and L. H. Somerville. 2018. "Developmental Patterns of Change in the Influence of Safe and Risky Peer Choices on Risky Decision-Making." *Developmental Science* 22: e12717. <https://doi.org/10.1111/desc.12717>.
- Brechwald, W. A., and M. J. Prinstein. 2011. "Beyond Homophily: A Decade of Advances in Understanding Peer Influence Processes." *Journal of Research on Adolescence: The Official Journal of the Society for Research on Adolescence* 21, no. 1: 166–179. <https://doi.org/10.1111/j.1532-7795.2010.00721.x>.
- Brehm, J. W. 1966. *A Theory of Psychological Reactance*. New York: Academic Press.
- Bush, T., and Q. Haiyan. 2000. "Leadership and Culture in Chinese Education." *Asia Pacific Journal of Education* 20, no. 2: 58–67. <https://doi.org/10.1080/02188791.2000.10600183>.
- Cascio, C. N., M. B. O'Donnell, J. Bayer, F. J. Tinney, and E. B. Falk. 2015. "Neural Correlates of Susceptibility to Group Opinions in Online Word-of-Mouth Recommendations." *JMR, Journal of Marketing Research* 52, no. 4: 559–575. <https://doi.org/10.1509/jmr.13.0611>.
- Chein, J. 2015. "Peers and Adolescent Risk Taking." In *Emerging Trends in the Social and Behavioral Sciences*. Hoboken, NJ: John Wiley & Sons, Inc. <http://onlinelibrary.wiley.com/doi/10.1002/9781118900772.etrds0170/abstract>.
- Cialdini, R. B., and N. J. Goldstein. 2004. "Social Influence: Compliance and Conformity." *Annual Review of Psychology* 55: 591–621. <https://doi.org/10.1146/annurev.psych.55.090902.142015>.
- Cislaghi, B., and L. Heise. 2018. "Four Avenues of Normative Influence: A Research Agenda for Health Promotion in Low and Mid-Income Countries." *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association* 37, no. 6: 562–573. <https://doi.org/10.1037/hea0000618>.
- Crone, E. A., and R. E. Dahl. 2012. "Understanding Adolescence as a Period of Social-Affective Engagement and Goal Flexibility." *Nature Reviews Neuroscience* 13, no. 9: 636–650. <https://doi.org/10.1038/nrn3313>.
- Dillard, J. P., L. Shen, and R. G. Vail. 2007. "Does Perceived Message Effectiveness Cause Persuasion or Vice Versa? 17 Consistent Answers." *Human Communication Research* 33, no. 4: 467–488. <https://doi.org/10.1111/j.1468-2958.2007.00308.x>.
- Dishion, T. J., and J. M. Tipsord. 2011. "Peer Contagion in Child and Adolescent Social and Emotional Development." *Annual Review of Psychology* 62: 189–214. <https://doi.org/10.1146/annurev.psych.093008.100412>.
- Duell, N., L. Steinberg, G. Icenogle, et al. 2018. "Age Patterns in Risk Taking Across the World." *Journal of Youth and Adolescence* 47, no. 5: 1052–1072.
- Erickson, K. G., R. Crosnoe, and S. M. Dornbusch. 2000. "A Social Process Model of Adolescent Deviance: Combining Social Control and Differential Association Perspectives." *Journal of Youth and Adolescence* 29, no. 4: 395–425. <https://doi.org/10.1023/A:1005163724952>.
- Foulkes, L., J. T. Leung, D. Fuhrmann, L. J. Knoll, and S.-J. Blakemore. 2018. "Age Differences in the Prosocial Influence Effect." *Developmental Science* 21, no. 6: e12666. <https://doi.org/10.1111/desc.12666>.
- Greenfield, P. M. 2000. "Three Approaches to the Psychology of Culture: Where Do They Come From? Where Can They Go?" *Asian Journal of Social Psychology* 3, no. 3: 223–240. <https://doi.org/10.1111/1467-839X.00066>.
- Greenfield, P. M., and L. K. Suzuki. 1998. "Culture and Human Development: Implications for Parenting, Education, Pediatrics, and Mental Health." *Handbook of Child Psychology* 4: 1059–1109. http://greenfieldlab.psych.ucla.edu/Cross-cultural_studies_files/gsl998.pdf.
- Hayes, A. F. 2009. "Beyond Baron and Kenny: Statistical Mediation Analysis in the New Millennium." *Communication Monographs* 76, no. 4: 408–420. <https://doi.org/10.1080/03637750903310360>.
- Heine, S. J., D. R. Lehman, K. Peng, and J. Greenholtz. 2002. "What's Wrong with Cross-Cultural Comparisons of Subjective Likert scales?: The Reference-Group Effect." *Journal of Personality and Social Psychology* 82, no. 6: 903–918. <https://doi.org/10.1037/0022-3514.82.6.903>.
- Heine, S. J., E. E. Buchtel, and A. Norenzayan. 2008. "What Do Cross-National Comparisons of Personality Traits Tell Us?" *Psychological Science* 19, no. 4: 309–313. <https://doi.org/10.1111/j.1467-9280.2008.02085.x>.
- Hofstede, G., B. Neuijen, D. D. Ohayv, and G. Sanders. 1990. "Measuring Organizational Cultures: A Qualitative and Quantitative Study Across Twenty Cases." *Administrative Science Quarterly* 35, no. 2: 286–316. <https://doi.org/10.2307/2393392>.
- Holt, C. L., E. M. Clark, D. L. Roth, et al. 2010. "Development and Validation of an Instrument to Assess Perceived Social Influence on Health Behaviors." *Journal of Health Psychology* 15, no. 8: 1225–1235. <https://doi.org/10.1177/1359105310365178>.
- Imada, T. 2012. "Cultural Narratives of Individualism and Collectivism: A Content Analysis of Textbook Stories in the United States and Japan." *Journal of Cross-Cultural Psychology* 43, no. 4: 576–591. <https://doi.org/10.1177/0022022110383312>.
- Jessor, R. 1984. "Adolescent Development and Behavioral Health." In *Behavioral Health: A Handbook of Health Enhancement and Disease Prevention*, 69–90. Hoboken, NJ: Wiley.
- Klucharev, V., K. Hytönen, M. Rijpkema, A. Smidts, and G. Fernández. 2009. "Reinforcement Learning Signal Predicts Social Conformity." *Neuron* 61, no. 1: 140–151. <https://doi.org/10.1016/j.neuron.2008.11.027>.
- Knoll, L. J., J. T. Leung, L. Foulkes, and S.-J. Blakemore. 2017. "Age-Related Differences in Social Influence on Risk Perception Depend on the Direction of Influence." *Journal of Adolescence* 60: 53–63. <https://doi.org/10.1016/j.adolescence.2017.07.002>.
- Knoll, L. J., L. Magis-Weinberg, M. Speekenbrink, and S.-J. Blakemore. 2015. "Social Influence on Risk Perception During Adolescence." *Psychological Science* 26, no. 5: 583–592. <https://doi.org/10.1177/0956797615569578>.
- Korbin, J. E. 2011. "The Cultural Nature of Human Development. Barbara Rogoff." Oxford University Press. 2003 xiii+448 *Ethos* 39, no. 1: 1–2. <https://doi.org/10.1111/j.1548-1352.2011.01177.x>.
- Lam, C. M. 1997. "A Cultural Perspective on the Study of Chinese Adolescent Development." *Child & Adolescent Social Work Journal: C&A* 14, no. 2: 95–113. <https://doi.org/10.1023/a:1024553132465>.
- Lansford, J. E., S. Zietz, M. H. Bornstein, et al. 2020. "Opportunities and Peer Support for Aggression and Delinquency During Adolescence in Nine Countries." *New Directions for Child and Adolescent Development* 2020, no. 172: 73–88. Portico. <https://doi.org/10.1002/cad.20361>.
- Larimer, M. E., and C. Neighbors. 2003. "Normative Misperception and the Impact of Descriptive and Injunctive Norms on College Student Gambling." *Psychology of Addictive Behaviors: Journal of the Society of Psychologists in Addictive Behaviors* 17, no. 3: 235–243. <https://doi.org/10.1037/0893-164X.17.3.235>.
- Leung, K., and S. Iwawaki. 1988. "Cultural Collectivism and Distributive Behavior." *Journal of Cross-Cultural Psychology* 19, no. 1: 35–49. <https://doi.org/10.1177/0022002188019001003>.
- Li, L. M. W., J. Ma, Y. Lin, et al. 2018. "Functional Connectivity Pattern Underlies Individual Differences in Independent Self-Construct." *Social Cognitive and Affective Neuroscience* 13: 269–280. <https://doi.org/10.1093/scan/nsy008>.
- Liu, C., and S. Wang. 2009. "Transformation of Chinese Cultural Values in the Era of Globalization: Individualism and Chinese Youth." *Intercultural Communication Studies* XVIII, no. 2: 54–71. <https://www.s3-live.kent.edu/s3fs-root/s3fs-public/file/05-Changyuan-Liu-Song-Wang.pdf>.
- Liu, J., S. Zhao, X. Chen, E. Falk, and D. Albarracín. 2017. "The Influence of Peer Behavior as a Function of Social and Cultural Closeness: A Meta-Analysis of Normative Influence on Adolescent Smoking Initiation and Continuation." *Psychological Bulletin* 143, no. 10: 1082–1115. <https://doi.org/10.1037/bul0000113>.
- Luo, S., Y. Ma, Y. Liu, et al. 2015. "Interaction Between Oxytocin Receptor Polymorphism and Interdependent Culture Values on Human Empathy."

- Social Cognitive and Affective Neuroscience* 10, no. 9: 1273–1281. <https://doi.org/10.1093/scan/nsv019>.
- Ma, X., X. Xu, and J. Xu. 2016. “中国人集体主义的南北方差异及其文化动力 [Cultural Differences in Collectivism Between North and South China and its Cultural Motivation].” *Advances in Psychological Science* 24, no. 10: 1551–1555. <http://journal.psych.ac.cn/xlkxjz/CN/10.3724/SPJ.1042.2016.01551>.
- Ma, Y., D. Bang, C. Wang, et al. 2012. “Sociocultural Patterning of Neural Activity During Self-Reflection.” *Social Cognitive and Affective Neuroscience* 9: 73–80. <https://doi.org/10.1093/scan/nss103>.
- Martin, J. 2006. “Social Cultural Perspectives in Educational Psychology.” In *Handbook of educational psychology*, edited by P. A. Alexander, 1055: 595–614. Mahwah, NJ, US. <https://psycnet.apa.org/fulltext/2006-07986-025.pdf>.
- Miller, D. T., and D. A. Prentice. 2016. “Changing Norms to Change Behavior.” *Annual Review of Psychology* 67: 339–361. <https://doi.org/10.1146/annurev-psych-010814-015013>.
- Mollen, S., R. N. Rimal, and M. K. Lapinski. 2010. “What Is Normative in Health Communication Research on Norms? A Review and Recommendations for Future Scholarship.” *Health Communication* 25, no. 6–7: 544–547. <https://doi.org/10.1080/10410236.2010.496704>.
- Nash, S. G., A. McQueen, and J. H. Bray. 2005. “Pathways to Adolescent Alcohol Use: Family Environment, Peer Influence, and Parental Expectations.” *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine* 37, no. 1: 19–28. <https://doi.org/10.1016/j.jadohealth.2004.06.004>.
- Nook, E. C., S. F. Sasse, H. K. Lambert, K. A. McLaughlin, and L. H. Somerville. 2018. “The Nonlinear Development of Emotion Differentiation: Granular Emotional Experience Is Low in Adolescence.” *Psychological Science* 29, no. 8: 1346–1357. <https://doi.org/10.1177/0956797618773357>.
- Nook, E. C., and J. Zaki. 2015. “Social Norms Shift Behavioral and Neural Responses to Foods.” *Journal of Cognitive Neuroscience* 27, no. 7: 1412–1426. https://doi.org/10.1162/jocn_a_00795.
- Nunnally, J. C. 1994. *Psychometric Theory* 3E. New York, NY: Tata McGraw-Hill Education.
- Nyborg, K., J. M. Anderies, A. Dannenberg, et al. 2016. “Social Norms as Solutions.” *Science* 354, no. 6308: 42–43. <https://doi.org/10.1126/science.aaf8317>.
- Oettingen, G., and K. M. Zosuls. 2006. “Culture and Self-Efficacy in Adolescents.” *Self-Efficacy Beliefs of Adolescents* 5: 245–265. https://books.google.com/books?hl=en&lr=&id=P_onDwAAQBAJ&oi=fnd&pg=PA245&dq=culture+and+self+efficacy+in+adolescents&ots=rINfs-CIBM&sig=8BItU6IA6rPHbHwwLsdB4Ykb5zs.
- Park, J., and S. Kitayama. 2018. “Anger Expression and Health: The Cultural Moderation Hypothesis.” In *The Oxford handbook of integrative health science*, edited by C. D. Ryff and R. F. Krueger. New York: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780190676384.001.0001>.
- Park, S., and J. Shin. 2017. “The Influence of Anonymous Peers on Prosocial Behavior.” *PLoS ONE* 12, no. 10: e0185521. <https://doi.org/10.1371/journal.pone.0185521>.
- Patton, G. C., D. A. Ross, J. S. Santelli, S. M. Sawyer, R. M. Viner, and S. Kleinert. 2014. “Next Steps for Adolescent Health: A Lancet Commission.” *The Lancet; London* 383, no. 9915: 385–386. [https://doi.org/10.1016/S0140-6736\(14\)60039-8](https://doi.org/10.1016/S0140-6736(14)60039-8).
- Pei, R., D. Cosme, M. E. Andrews, B. D. Mattan, J. Carreras-Tartak, and E. B. Falk. 2023. “Cultural Influence on COVID-19 Cognitions and Growth Speed: The Role of Collectivism.” *Social and Personality Psychology Compass* 17, no. 12: e12908. <https://doi.org/10.1111/spc3.12908>.
- Pei, R., E. Kranzler, A. B. Suleiman, and E. B. Falk. 2019. “Promoting Adolescent Health: Insights From Developmental and Communication Neuroscience.” *Behavioural Public Policy* 3, no. 1: 47–71. <https://doi.org/10.1017/bpp.2018.30>.
- Pfeifer, J. H., and E. T. Berkman. 2018. “The Development of Self and Identity in Adolescence: Neural Evidence and Implications for a Value-Based Choice Perspective on Motivated Behavior.” *Child Development Perspectives* 12, no. 3: 158–164. <https://doi.org/10.1111/cdep.12279>.
- Pfeifer, J. H., and S.-J. Blakemore. 2012. “Adolescent Social Cognitive and Affective Neuroscience: Past, Present, and Future.” *Social Cognitive and Affective Neuroscience* 7, no. 1: 1–10. <https://doi.org/10.1093/scan/nsr099>.
- Philip Rice, F., and K. G. Dolgin. 2008. *The Adolescent: Development, Relationships, and Culture*. Boston, MA: Allyn and Bacon. <https://market.android.com/details?id=book-lahZAAAAAYAAJ>.
- Piko, B. F., A. Luszczynska, F. X. Gibbons, and M. Teközel. 2005. “A Culture-Based Study of Personal and Social Influences of Adolescent Smoking.” *European Journal of Public Health* 15, no. 4: 393–398. <https://doi.org/10.1093/eurpub/cki008>.
- Prinstein, M. J. 2007. “Moderators of Peer Contagion: A Longitudinal Examination of Depression Socialization Between Adolescents and Their Best Friends.” *Journal of Clinical Child and Adolescent Psychology* 36, no. 2: 159–170. <https://doi.org/10.1080/15374410701274934>.
- Pumariega, A. J., and S. V. Joshi. 2010. “Culture and Development in Children and Youth.” *Child and Adolescent Psychiatric Clinics of North America* 19, no. 4: 661–680. <https://doi.org/10.1016/j.chc.2010.08.002>.
- Reiter, A. M. F., M. Moutoussis, L. Vanes, et al. 2021. “Preference Uncertainty Accounts for Developmental Effects on Susceptibility to Peer Influence in Adolescence.” *Nature Communications* 12, no. 1: 3823. <https://doi.org/10.1038/s41467-021-23671-2>.
- Riemer, H., S. Shavitt, M. Koo, and H. R. Markus. 2014. “Preferences Don’t Have to be Personal: Expanding Attitude Theorizing With a Cross-Cultural Perspective.” *Psychological Review* 121, no. 4: 619–648. <https://doi.org/10.1037/a0037666>.
- Rivis, A., and P. Sheeran. 2003. “Descriptive Norms as an Additional Predictor in the Theory of Planned Behaviour: A Meta-Analysis.” *Current Psychology* 22, no. 3: 218–233. <https://doi.org/10.1007/s12144-003-1018-2>.
- Roest, A. M. C., J. S. Dubas, and J. R. M. Gerris. 2009. “Value Transmissions Between Fathers, Mothers, and Adolescent and Emerging Adult Children: The Role of the Family Climate.” *Journal of Family Psychology* 23, no. 2: 146–155. <https://doi.org/10.1037/a0015075>.
- Rosseel, Y. 2012. “Lavaan: An R Package for Structural Equation Modeling and More. Version 0.5-12 (BETA).” *Journal of Statistical Software* 48, no. 2: 1–36.
- Rothenberg, W. A., J. E. Lansford, M. H. Bornstein, et al. 2020. “Effects of Parental Warmth and Behavioral Control on Adolescent Externalizing and Internalizing Trajectories Across Cultures.” *Journal of Research on Adolescence* 30, no. 4: 835–855. Portico. <https://doi.org/10.1111/jora.12566>.
- Schriber, R. A., and A. E. Guyer. 2016. “Adolescent Neurobiological Susceptibility to Social Context.” *Developmental Cognitive Neuroscience* 19, no. SC: 1–18. <https://doi.org/10.1016/j.dcn.2015.12.009>.
- Sherman, L. E., A. A. Payton, L. M. Hernandez, P. M. Greenfield, and M. Dapretto. 2016. “The Power of the Like in Adolescence: Effects of Peer Influence on Neural and Behavioral Responses to Social Media.” *Psychological Science* 27: 1027–1035. <https://doi.org/10.1177/0956797616645673>.
- Simons-Morton, B., N. Lerner, and J. Singer. 2005. “The Observed Effects of Teenage Passengers on the Risky Driving Behavior of Teenage Drivers.” *Accident; Analysis and Prevention* 37, no. 6: 973–982. <https://doi.org/10.1016/j.aap.2005.04.014>.
- Singelis, T. M. 1994. “The Measurement of Independent and Interdependent Self-Construals.” *Personality & Social Psychology Bulletin* 20, no. 5: 580–591. <https://doi.org/10.1177/0146167294205014>.
- Somerville, L. H., R. M. Jones, and B. J. Casey. 2010. “A Time of Change: Behavioral and Neural Correlates of Adolescent Sensitivity to Appetitive and Aversive Environmental Cues.” *Brain and Cognition* 72, no. 1: 124–133. <https://doi.org/10.1016/j.bandc.2009.07.003>.
- Steel, P., V. Taras, K. Uggerslev, and F. Bosco. 2018. “The Happy Culture: A Theoretical, Meta-Analytic, and Empirical Review of the Relationship

- Between Culture and Wealth and Subjective Well-Being." *Personality and Social Psychology Review* 22, no. 2: 128–169. <https://doi.org/10.1177/1088868317721372>.
- Steinberg, L., and K. C. Monahan. 2007. "Age Differences in Resistance to Peer Influence." *Developmental Psychology* 43, no. 6: 1531–1543. <https://doi.org/10.1037/0012-1649.43.6.1531>.
- Steinberg, L., and A. S. Morris. 2001. "Adolescent Development." *Annual Review of Psychology* 52: 83–110. <https://doi.org/10.1146/annurev.psych.52.1.83>.
- Steinberg, L., and S. B. Silverberg. 1986. "The Vicissitudes of Autonomy in Early Adolescence." *Child Development* 57, no. 4: 841–851. <https://www.ncbi.nlm.nih.gov/pubmed/3757604>.
- Sumter, S. R., C. L. Bokhorst, L. Steinberg, and P. M. Westenberg. 2009. "The Developmental Pattern of Resistance to Peer Influence in Adolescence: Will the Teenager Ever be Able to Resist?" *Journal of Adolescence* 32, no. 4: 1009–1021. <https://doi.org/10.1016/j.adolescence.2008.08.010>.
- Unger, J. B., A. Ritt-Olson, L. Teran, T. Huang, B. R. Hoffman, and P. Palmer. 2002. "Cultural Values and Substance Use in a Multiethnic Sample of California Adolescents." *Addiction Research & Theory* 10, no. 3: 257–279. <https://doi.org/10.1080/16066350211869>.
- Unger, J. B., L. Yan, S. Shakib, et al. 2002. "Peer Influences and Access to Cigarettes as Correlates of Adolescent Smoking: A Cross-Cultural Comparison of Wuhan, China, and California." *Preventive Medicine* 34, no. 4: 476–484. <https://doi.org/10.1006/pmed.2001.0996>.
- van de Bongardt, D., E. Reitz, T. Sandfort, and M. Deković. 2015. "A Meta-Analysis of the Relations Between Three Types of Peer Norms and Adolescent Sexual Behavior." *Personality and Social Psychology Review* 19, no. 3: 203–234. <https://doi.org/10.1177/1088868314544223>.
- van Hoorn, J., E. van Dijk, R. Meuwese, C. Rieffe, and E. A. Crone. 2016. "Peer Influence on Prosocial Behavior in Adolescence." *Journal of Research on Adolescence* 26, no. 1: 90–100. <https://doi.org/10.1111/jora.12173>.
- Walker, M. B., and M. G. Andrade. 1996. "Conformity in the Asch Task as a Function of Age." *The Journal of Social Psychology* 136, no. 3: 367–372. <https://doi.org/10.1080/00224545.1996.9714014>.
- Wang, W., Y. Zhao, and B. Chen. 2018. "个体主义-集体主义对双文化认同整合影响的路径分析 [A structural path analysis on the influence of individualism—collectivism on bi-cultural identity]." *Journal of Southwest University for Nationalities (Humanities and Social Science)*.
- Welborn, B. L., M. D. Lieberman, D. Goldenberg, A. J. Fuligni, A. Galvan, and E. H. Telzer. 2016. "Neural Mechanisms of Social Influence in Adolescence." *Social Cognitive and Affective Neuroscience* 11: 100–109. <https://doi.org/10.1093/scan/nsv095>.
- White, F. A., and K. M. Matawie. 2004. "Parental Morality and Family Processes as Predictors of Adolescent Morality." *Journal of Child and Family Studies* 13, no. 2: 219–233. <http://dx.doi.org/10.1023/B:JCFS.0000015709.81116.ce>.
- Zaki, J., J. Schirmer, and J. P. Mitchell. 2011. "Social Influence Modulates the Neural Computation of Value." *Psychological Science* 22, no. 7: 894–900. <https://doi.org/10.1177/0956797611411057>.

Supporting Information

Additional supporting information can be found online in the Supporting Information section.