

## Associations between hegemonic masculine norms and academic outcomes among youth in China and the United States

Anna Bennet<sup>a,\*</sup>, Rui Yang<sup>b,1</sup>, Angelica Ferrara<sup>c</sup>, Yana Kuchirko<sup>d</sup>, Niobe Way<sup>a</sup>,  
Diane Hughes<sup>a</sup>

<sup>a</sup> Department of Applied Psychology, New York University, United States of America

<sup>b</sup> Department of Psychology, NYU Abu Dhabi, United Arab Emirates

<sup>c</sup> The Clayman Institute for Gender Research, Stanford University, United States of America

<sup>d</sup> Department of Psychology, Brooklyn College City University of New York, United States of America

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### ABSTRACT

Hegemonic masculine norms are associated with lower adolescent psychological and social well-being for boys and girls across cultural contexts. A growing body of research, primarily focused on Western populations, suggests that adherence to hegemonic masculine norms may also pose a risk to academic achievement. However, the mechanisms underlying this association remain underexplored. This study investigates school engagement as a potential mediator through which greater adherence to hegemonic masculinity influences poorer academic performance. Using data collected in the United States ( $n = 947$ ) and China ( $n = 710$ ), we explored whether the influence of hegemonic masculinity on academic outcomes can be observed across national and cultural contexts. Specifically, we examined relations between adherence to hegemonic masculine norms in 7th grade and academic engagement and performance in 8th grade among U.S. and Chinese boys and girls. Results show that higher levels of adherence to hegemonic masculine norms were associated with lower academic performance across gender and nationality. Moreover, school engagement partially mediated the association between adherence to hegemonic masculine norms and academic performance in both U.S. and Chinese samples. Implications for policy makers and educators are discussed in relation to both cultures in which our data is situated.

Dominant ideals of masculinity, also known as *hegemonic masculine norms*, profoundly shape human development (American Psychological Association and Boys and Men Guidelines Group, 2018; Kimmel, 2008; Mahalik et al., 2003; Pleck et al., 1993; Rogers et al., 2020; Way, 2011; Way et al., 2014; Wong et al., 2017). Adherence to hegemonic masculine norms is defined as engaging in attitudes and behaviors that align with these ideologies (e.g., Gupta et al., 2013; Rogers, DeLay, & Martin, 2017) and uphold the status of certain groups over others (i.e. men/masculinity over women/femininity). Across cultures, hegemonic masculine ideologies promote suppression of emotional vulnerability, avoidance of help-seeking, and the pursuit of exaggerated physical toughness to remain on top of the social hierarchy (Budgeon, 2014; Levant & Richmond, 2008; Mahalik et al., 2003). Adherence to these attitudes and behaviors, in turn, has been linked to poorer psychological and social well-being, including higher rates of depression, anxiety, delinquency, substance use, and lower self-esteem in the United States

(American Psychological Association and Boys and Men Guidelines Group, 2018; Feder et al., 2010; Gini & Pozzoli, 2006; Kimmel & Mahler, 2003; Oliffe & Phillips, 2008; O'Neil, 2012; Pollack, 1998; Rogers, DeLay, & Martin, 2017; Sanders, 2011; Uy et al., 2014) and China (Gupta et al., 2013; Rogers et al., 2020).

Extant work (Leaper et al., 2019; Renold, 2001; Rogers, Updegraff, et al., 2017; Santos et al., 2013) and the APA Guidelines for Psychological Practice with Boys and Men (2018) suggest that adherence to hegemonic masculine norms may also contribute to poor academic outcomes in adolescence. In particular, hegemonic masculine norms are antithetical to attitudes and behaviors that are inherent features of engaging and performing well in school. However, these relations have primarily been investigated in Western populations. Comparing contexts with historically distinct relationships between gender norms and schooling offer unique opportunities to illuminate the specific cultural conditions that give rise to a high degree of adherence to hegemonic

\* Corresponding author at: New York University, Department of Applied Psychology, 246 Greene Street, 516E, New York, NY 10003, United States of America.  
E-mail address: [atb273@nyu.edu](mailto:atb273@nyu.edu) (A. Bennet).

<sup>1</sup> Authors contributed equally.

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masculine norms. At the same time, such comparisons can help specify the underlying mechanisms by which adherence to hegemonic masculine norms thwarts academic performance. In the United States, the social construct of gender has long been deeply entangled with school engagement. For example, girls who adhere to feminine norms participate in school, while boys who adhere to masculine norms, particularly hegemonic masculine norms, distance themselves from school (Lazaro & Bian, 2024; Morris, 2012). In China, however, both boys and girls are traditionally expected to perform well academically, independent of their gender norm adherence (Louie, 2002). Although contemporary Chinese masculinity is increasingly framed around similar hegemonic norms as in the United States (Hu & Guan, 2021; Louie, 2024), the association between hegemonic masculine norms and academic outcomes has yet to be explored in China. Examining this association in the Chinese context offers an opportunity to reveal further cultural and historical factors that influence how hegemonic masculinity shapes academic outcomes.

In the present study, we examined the relations between adolescents' adherence to hegemonic masculine norms and academic performance and school engagement in China and the United States. Moreover, we investigated whether the relations differ for boys and girls. Finally, we sought to further explain the underpinnings of the link between adherence to hegemonic masculine norms and academic performance by testing school engagement as a potential mediator. In doing so, we considered both the possibility of cross-cultural similarity and generalizability, as well as culturally shaped variation in how adherence to hegemonic masculinity is associated with adolescents' experiences in school. Our findings have implications for understanding how gendered cultural norms shape youth's educational trajectories in different cultural contexts and underscore the need for culturally-grounded supports that bolster school engagement among boys and girls, particularly among youth who negotiate hegemonic masculinity.

### Hegemonic masculine norms in the United States and China

We situate our study within ecological, socio-structural approaches that center systems of oppression and master narratives in social-development processes (Rogers et al., 2021; Syed & McLean, 2022, 2023). An ecological systems perspective considers individuals within layers of cultural context, ranging from the immediate microsystem (e.g., with family and peers) to the broader macrosystem (e.g. societal norms and ideologies) (Bronfenbrenner & Morris, 2007; Coll et al., 1996; Spencer et al., 1997). The macrosystem encompasses societal beliefs and norms, perpetuated through widely shared master narratives dictating how society "should" operate, for example, that individuals adhering to hegemonic masculine norms have higher status than those who do not (Rogers & Way, 2018; Syed & McLean, 2022, 2023). In the present study, we construe hegemonic masculine norms through the *m(ai)cro lens* (Rogers et al., 2021). *M(ai)cro* extends existing ecological theories by situating the macrosystem at the forefront of human development. In this regard, youth's adherence and resistance to hegemonic masculine norms occur in their proximal settings, for example with peers, which are inextricably shaped by broader discourses and policies. Macro-socialization of hegemonic masculinity may therefore be evident in youths' micro-relations with peers, which then influences, indirectly, their experiences in academic contexts.

Extant research demonstrates that masculinity is a multifaceted construct that can manifest in different forms—for example, as hegemonic or caring masculinities (Connell & Messerschmidt, 2005; Nayak, 2023). We focus specifically on the culturally dominant hegemonic masculine norms, which hold the highest status in societies where patriarchal gender structures are most deeply entrenched (Kessler et al., 1982), including in the United States (Connell, 1998, 2012) and China (Ma et al., 2021; Song & Hird, 2014). These masculine norms are particularly salient for individuals and shape their attitudes, behaviors, and outcomes throughout the lifespan (Connell & Messerschmidt,

2005). Hegemonic masculine norms can be construed as culturally located stories or scripts that communicate expectations on how boys and men ought to "be" (McLean et al., 2016). As master narratives, such scripts operate at individual and structural levels, informing how people accommodate and resist masculine ideologies in their daily lives and how such ideologies are reinforced or challenged via policies, norms, and institutions. With globalization, it could be argued that hegemonic masculine norms originating primarily in Western contexts are gaining influence on the global stage and spreading internationally (Connell & Messerschmidt, 2005). However, their effects on local and regional gender dynamics, for example in China, may vary according to cultural contextual processes (Connell & Messerschmidt, 2005; Louie, 2002).

The footprint of hegemonic masculine norms is evident in China. Historically, idealized masculinity in China was represented by a balance of cultural refinement, "Wen" and physical strength, "Wu". Wen, however, has typically been prioritized as the marker of social status and power (Louie, 2002). The prominence of Wen, often conceptualized as "soft" and "artistic", has coincided with the rise of a more "feminized" ideal of masculinity in China, embodied by androgynous male figures popular among younger generations (Louie, 2015; Song, 2022). In recent years, however, the "soft" or "feminized" ideal has faced strong backlash. Concerns over a "masculinity crisis" in China have led scholars and educators to argue that boys are becoming academically underperforming, physically weak, and psychologically vulnerable (Zhu et al., 2022). This concern has fueled public debate and state-led initiatives aimed at addressing the so-called "boy crisis" by promoting physical activity, recruiting more male teachers and, recently, suspending male performers who do not conform to hegemonic masculine ideals (Louie, 2024; Song, 2022; Zhu et al., 2022). These efforts are believed to reflect a broader cultural shift in the idealization of masculinity, rooted in concerns about China's national strength and security, and its position in the global economic and geopolitical landscape (Hu & Guan, 2021; Louie, 2024; Song, 2022).

### Hegemonic masculine norms among women and girls

Due to their high cultural status, hegemonic masculine norms in both China and the United States influence not only men, but also women. Specifically, adherence to hegemonic masculine norms has become a way for girls and women to ascend social ladders and achieve status and influence across social contexts (Ahlqvist et al., 2013; Brown, 2003; Brown & Gilligan, 1992; Paechter & Clark, 2007). Historically and presently, feminine norms in the United States and China prescribe that girls and women should be submissive, nurturing, and soft (Evans, 2002; Prentice & Carranza, 2002). However, ideological shifts have altered gender roles and expectations in both countries in unique ways. In China, the influence of Mao brought about the expectation that women reject many stereotypically feminine qualities and act as near equals to men in appearance, behaviors, and attitudes (Huang, 2018). In contemporary post-Mao China, traditional femininity appears to merge with hegemonic masculine norms deemed necessary for success, particularly in professional settings (Liu, 2013). These norms include independence, toughness, assertiveness, and not displaying emotional weakness (Wang, 2013). Similarly, in U.S. contexts, hegemonic masculine norms (and their status) increasingly influence girls (Rogers et al., 2020). Specifically, at the start of adolescence, many girls begin to reject previously treasured girliness for the privilege of being viewed as "one of the boys" (Halim et al., 2011). This trend has increasingly resulted in girls' adherence to hegemonic masculine norms (Rogers et al., 2020). In fact, as evidenced in recent work, girls from diverse ethnic/racial and SES backgrounds, and across the United States and China, not only show high levels of adherence to hegemonic masculine norms, but also associations between adherence to hegemonic masculine norms and poor psychosocial well-being (Rogers et al., 2020). These findings underscore the importance of unpacking the cultural mechanisms that drive hegemonic masculine norms and their negative influence on youth

adjustment.

### Hegemonic masculine norms in education contexts

In this study, we focused on how hegemonic masculine norms are intertwined with one of the most important institutions in youth's lives: school. In the United States, gender norms are highly influential in school settings, starting from center-based care and preschool (Bennet et al., 2020) and continuing through high school (Starr & Simpkins, 2021) and university (Dunlap & Barth, 2023). Through engagement with peers and adults, as well as learning experiences and materials at school, youth are introduced to and socialized into mainstream ideologies, including those related to the gender binary. By negotiating gender ideologies, children learn that certain attitudes, behaviors, and skills are not only considered more typical of one gender, but also valued differently depending on how they are gender-typed. In most settings embedded in patriarchal contexts, traits associated with hegemonic masculine norms tend to hold higher status (i.e., self-reliance, a masculine-typed trait, is often valued more highly than help-seeking, a feminine-typed trait, e.g., Addis & Mahalik, 2003). However, in school contexts like those in the United States, adherence to hegemonic masculine norms may hinder students from doing well (Kimmel & Mahler, 2003; Leaper et al., 2019; Marrs, 2016). As we state above and describe in more detail below, not seeking help when needed, or refusing to display weakness in front of teachers and classmates, could prevent students from reaching their fullest academic potential.

A growing body of research, along with the current 2018 APA guidelines, specifically aimed at psychological practice with boys and men, provides compelling evidence that adherence to hegemonic masculine norms is a risk factor for academic performance among U.S. students (Pleck et al., 1993; Rogers, Updegraff, et al., 2017; Santos et al., 2013). An initial study on adherence to hegemonic masculine norms and adolescent performance in school found that students with higher levels of adherence to hegemonic masculine norms, described as "rough" and "not emotional", were more likely to have lower GPAs than students with lower levels of adherence (Burke, 1989). Recent work has confirmed these associations among U.S. male adolescents from Mexican/Latine and European American backgrounds (Santos et al., 2013).

We build on Santos and colleagues' work (2013) by extending the focus of inquiry to U.S. girls, as well as to girls and boys in China. Prior work has found that associations between hegemonic masculine norms and socioemotional outcomes are similar for U.S. and Chinese youth across gender (Gupta et al., 2013; Rogers et al., 2020). Given the global reach of hegemonic masculinity, it is plausible that these norms also shape academic outcomes in comparable ways across cultural contexts. At the same time, the relationship between gender norms and schooling in China has developed along a markedly different historical trajectory than in the United States. For over 1300 years, China has relied on standardized examinations (Keju) to select talented students for high-status civil service positions (Lee, 2000). The current national college admission system is still almost solely based on the results from one high-stakes examination referred to as the Gaokao. As a result, China's primary and secondary education systems are deeply oriented toward academic achievement, with all students, regardless of gender, driven and pressured to succeed in school (Sun et al., 2013). However, the effect of hegemonic masculine norms on Chinese adolescents' academic performance remains underexplored.

### Hegemonic masculinity and school engagement

Students' school engagement is key to their academic performance (Chase et al., 2014). Construed as a multidimensional construct, school engagement comprises behavioral, cognitive, and emotional components representing how students act, think, and feel when interacting with aspects of school (Christenson et al., 2012). In our study, we

focused on the emotional and behavioral dimensions of school engagement; the extent to which students feel emotionally connected to school and the degree to which they make efforts to do well academically. Adherence to hegemonic masculine norms may interfere with the emotional and behavioral dimensions of adolescents' engagement in school. U.S. and European adolescent boys and girls equate hegemonic masculinity with being "too cool for school," and students who strongly adhere to hegemonic masculine norms take great pride in not putting effort into schoolwork or studying hard for good grades (Heyder & Kessels, 2015, 2017; Jackson & Dempster, 2009; Morris, 2008, 2011). Moreover, male students have reported that "real boys,"—those who sufficiently adhere to hegemonic masculine norms—should avoid academic efforts (Jackson & Dempster, 2009). Consequently, boys who work hard in school and receive higher grades are viewed as lacking in masculinity by their peers (Kimmel & Mahler, 2003; Morris, 2008).

There are additional ways in which hegemonic masculinity interferes with students' emotional and behavioral school engagement. Learning in relationship with teachers and peers, such as connecting with them for guidance and feedback, is a fundamental component of school engagement (Ryan & Pintrich, 1997), as are positive interactions in the classroom (Chung-Hall & Chen, 2010; Perdue et al., 2009; Roorda et al., 2011). Emotional stoicism, and avoidance of help-seeking can prevent students from building productive relations at school, and successfully resolving academic roadblocks with the help of teachers and classmates. This, in turn, may perpetuate further disconnection from school and academic work (Leaper et al., 2019; Marrs, 2016; Rogers, DeLay, & Martin, 2017; Rogers, Updegraff, et al., 2017).

Relatedly, acting tough and aggressive alienates both peers and teachers, leading to increased interpersonal conflict, rejection, and frustration in the classroom (Rogers, Updegraff, et al., 2017; Santos et al., 2013; Ueno & McWilliams, 2010). Extant studies replicate these findings among Western adolescent populations of different ethnic-racial backgrounds and provide an empirical basis to test whether school engagement mediates the relation between adherence to hegemonic masculine norms and academic achievement. Being engaged in school, that is, making efforts to understand the teacher and assignments, enjoying learning, and trying hard to do well, are considered key to successful academic performance (e.g., Ryan & Pintrich, 1997). Adherence to hegemonic masculine norms, however, interferes with school engagement (Leaper et al., 2019; Rogers, DeLay, & Martin, 2017; Santos et al., 2013). Based on existing evidence, we expect that school engagement might be the mechanism through which higher adherence to hegemonic masculinity leads to poorer academic achievement in China and the United States. Even though there is strong cultural pressure for Chinese adolescents to excel academically, hegemonic masculine norms may undermine their school engagement and, in turn, lower their academic performance.

### Current study

In this study, we examined relations between adherence to hegemonic masculinity and academic outcomes among youth in the United States and China. Three research questions guided our study:

RQ1: Is adherence to hegemonic masculine norms for boys and girls in 7th grade associated with their academic performance in 8th grade in the United States and China?

RQ2: Does the association between hegemonic masculine norms and academic performance vary by gender?

RQ3: Does school engagement in 7th grade mediate the relations between adherence to hegemonic masculine norms and academic performance from grade 7 to 8 in the United States and China?

For RQ1, we hypothesized that adherence to hegemonic masculine norms in 7th grade would be associated with lower 8th grade academic performance in both the United States and China (Gupta et al., 2013; Santos et al., 2013). For RQ2, we hypothesized that associations between adherence to hegemonic masculinity in 7th grade and 8th grade

academic performance do not differ by gender within the United States and China (Rogers, Updegraff, et al., 2017). Finally, for RQ3, we expected school engagement to mediate the relations between adherence to hegemonic masculine norms and academic performance from grade 7 to 8 in the United States and China (Leaper et al., 2019; Rogers, Updegraff, et al., 2017).

We focus on youth aged 12–13, a transitional period from late childhood into early adolescence marked by rapid and complex developmental change (Mascia et al., 2023). During these years, the onset of puberty initiates a cascade of physical, psychological, and social transformations that reshape youth's sense of identity and interpersonal relationships (Mascia et al., 2023). Although children begin to recognize and internalize culturally embedded gender norms in early childhood (e.g., Martin & Ruble, 2004), early adolescence is a period when engagement with these norms, particularly hegemonic masculine norms, intensifies (Halim et al., 2011; Way, 2011). By ages 12–13, many youths not only understand the hierarchical nature of gender norms, including the elevated status associated with hegemonic masculinity, but also begin to actively negotiate these norms in ways that have consequences for their socioemotional and psychological development (Gilligan, 2011; Halim et al., 2011; Rogers et al., 2020; Way, 2011; Way et al., 2014). These years are additionally critical given the increasing salience of peer relationships that, in turn, provide social contexts in which youth engage in gender identity work (e.g., Kornienko et al., 2016). Importantly, ages 12–13 also correspond to a key academic and social transition in China and the United States: the start of middle school. Middle school environments are characterized by increased academic demands, heightened rigor, competition, and responsibility, and more formalized evaluation practices, including standardized testing (Goldstein et al., 2015; Ma, 2024). As such, this developmental window offers a unique opportunity to investigate how youth's adherence to hegemonic masculine norms, emerging as particularly salient and socio-culturally reinforced, associates with school engagement and academic performance at a time when these constructs are becoming deeply embedded in youth's evolving identities and developmental trajectories.

Our goal for including both Chinese and U.S. adolescent samples is not to conduct direct, between-group comparisons, nor to position one country and culture as a benchmark for the other. Rather, we explore whether the associations between hegemonic masculine norms, school engagement, and academic achievement, associations that have been established primarily in U.S.-based research, are also observable in a culturally distinct context. By including both samples, we leverage existing findings from the United States as a conceptual starting point, not a standard, which allows us to better interpret the Chinese data in light of shared and divergent developmental processes. Although China and the United States differ in aspects of contemporary school structures, gender socialization practices, and historical framing of gender and education, they also share similarities, for example, increasing engagement with hegemonic masculine norms in early adolescence (Rogers et al., 2020). Thus, including both samples illuminates whether these processes may reflect more global developmental patterns or are shaped in culturally specific ways. Specifically, our comparative design enables us to interpret findings from China and the United States not in isolation, but in a broader context, with attention to both parallels and divergences in the strengths and nature of the associations.

## Methods

### Participants

Data used for the current study were pulled from two comprehensive, longitudinal studies of adolescent socioemotional development in New York City, the United States and Nanjing, China (Rogers et al., 2020). The U.S. study started when youth were in 6th grade, their first year of middle school, with 1040 adolescents and a retention rate of 74 % by 8th grade. Participants in both countries were asked to self-report on their

gender identification (51.5 % girls). We used data from the 7th and 8th grade timepoints in both the Chinese and U.S. samples. We did so to ensure maximum data availability and cross-sample comparability, for example in terms of participants' age. Additionally, our measure of hegemonic masculinity was only collected for part of the sample in the 6th grade U.S. data. The U.S. sample consists of 947 adolescents (52.38 % girls) who has at least one wave of data available (participants with both waves available  $n = 567$ ). The U.S. adolescents were purposefully sampled from schools with ethnic-racially (22.91 % African American, 20.59 % Chinese American, 28.62 % Latinx [10.88 % Puerto Rican, 16.26 % Dominican American, 1.48 % Mexican American], and 27.88 % White) and socioeconomically diverse student bodies. School achievement significantly varied between the 25th and 75th percentile (as measured by aggregated citywide test scores).

In the Chinese sample, the study started at 7th grade (first year of middle school) with 710 adolescents (50 % girls), and the retention rate was 97 % in 8th grade. Chinese adolescents were purposefully recruited from schools ranked via their official record of admission rates as being one of three different achievement levels at the time of data collection: high-achieving (Provincial Tier-4), mid-achieving (Provincial Tier-3), and low-achieving (not ranked as Key) (see Rogers et al., 2020 for more details). In the Chinese sample, 359 mothers and 356 fathers returned questionnaires in 7th grade listing their educational level. Based on their report, 21.2 % of mothers and 26.1 % of fathers had a high school degree or below, 43.2 % of mothers and 31.2 % of fathers had a high school degree, and 35.7 % of mothers and 42.7 % of fathers had completed college or a more advanced degree. We then composited a variable of the highest degree of parental education for each adolescent (20.7 % middle school degree or below, 34.7 % high school, and 44.6 % college degree or above), as an indicator of students' socioeconomic status.

As a point of clarification: Although our U.S. sample includes Chinese American youth, we use the term "U.S." to refer to participants residing in the United States, regardless of ethnic and racial background, and "Chinese" to refer to participants residing in China. This, as our analysis focuses on parallel patterns in national and cultural contexts, rather than on ethnic or racial group comparisons.

### Procedure

Beginning in their first year of middle school (6th grade in New York and 7th grade in Nanjing), adolescent participants were surveyed annually for two additional consecutive years. Parental consent was obtained via forms distributed to students in classrooms (the United States and China), or to parents at parent-teacher conferences (the United States). Students returned the signed forms to their teachers. U.S. adolescents were interviewed and assessed in English, and Chinese adolescents in Chinese. Most questionnaires and surveys were identical across the two countries, with the English versions translated and then back-translated by researchers fluent in both languages. Adolescents filled out measures in their classrooms during regular school hours and received \$5 or a gift of comparable value upon completion.

### Measures

#### Adherence to hegemonic masculine norms

Adolescents' adherence to hegemonic masculine norms (7th grade) was measured via Gender-typed Attitudes with Peers Scale (GAPS, Gupta et al., 2013), which is a single-factor, eight-item Likert-type measure (responses ranging from 1 = *strongly disagree* to 4 = *strongly agree*). This measure has been used among boys and girls in China and the United States (Gupta et al., 2013; Rogers et al., 2020; Yang et al., 2024). Combined, the eight items target the hegemonic masculine norms commonly found in adolescent relationships with peers (i.e., suppression of emotional vulnerability, avoidance of help-seeking, and exaggerated physical toughness). Examples of items include *I do not let it*

show to my friends when my feelings are hurt, and I cannot respect a friend who backs down from a fight. Higher values of the composite score indicate higher levels of hegemonic masculinity adherence. Cronbach's alpha values were 0.73 for youth in the United States and 0.73 for youth in China.

Even though we do not directly compare the effects found in our U.S. and Chinese samples, we assessed cross-cultural equivalence of this key measure of hegemonic masculinity adherence with a multigroup confirmatory factor analysis (CFA) of single-factor structure. We compared the model with free estimates of all parameters with the model in which all factor loadings were constrained to be equal. Following recommendations by Chen (2007), we computed the difference between model fit statistics, which are Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean-square Residual (SRMR), and Comparative Fit Index (CFI), to determine metric invariance: Differences greater than, or equal to  $-0.01$  in CFI,  $0.015$  in RMSE, or  $0.03$  in SRMR would suggest non-invariance between models. Model fit statistics suggested GAPS has metric invariance across two samples: CFI = 0.83,  $\Delta$ CFI =  $-0.02$ ; RMSEA = 0.09 (0.08, 0.10),  $\Delta$ RMSEA =  $-0.004$ ; SRMR = 0.06,  $\Delta$ SRMR = 0.01.

#### Academic performance

U.S. adolescents' academic performance was measured through the average score of self-reported grades in four different subjects (math; ELA; science; social studies). Participants were asked to report the grades received in their latest report cards using a 9-item Likert-type measure (responses ranging from 1 = *Mostly F's, 59 or below* to 9 = *Mostly A's, 100-90*). Official school records were collected from a small portion of the overall sample (approximately 24 %), which correlated highly with adolescents' own reports of their grades in math ( $r = 0.86$ ), ELA ( $r = 0.74$ ), science ( $r = 0.73$ ), social studies ( $r = 0.78$ ). For analysis, grades were recoded as the average of the interval in each subject (e.g. category 8 is recoded into the value of 97; category 7 into the value of 92, etc.). We then created an overall grade score, which was the average of all four subject grades. Chinese adolescents' academic performance was based on the average overall score of their official test scores across four subjects: math, physics, Chinese language arts and English (as a second language). Scores were averaged from two midterm and two final exams in each subject (100 being the perfect score). As exams were not consistent across all schools and achievement level differed by school, we centered individual scores around the school-mean for the final scores to reflect student performance above or below the mean of each school.

#### School engagement

Adolescents' school engagement was measured with two scales that corresponded across our U.S. and Chinese samples and were pulled from the Rochester Assessment Package for Schools (Wellborn & Connell, 1987). In the U.S. sample, the scale contains twenty Likert-type items (responses ranging from 0 = *never* to 4 = *all the time*) that cover two dimensions (behavioral and emotional engagement in the classroom). Examples of items include *I try hard to do well in school* and *Class is fun*. A composite score was obtained per subject and higher values indicating higher levels of school engagement. Cronbach's alpha coefficient for the U.S. sample was 0.90. In the Chinese sample, a subscale of eight items was created from a fifteen-item Likert-type scale (responses ranging from 1 = *not at all true* to 4 = *completely true*). Similar to its U.S. counterpart, the Chinese subscale covers a behavioral and emotional dimension of school engagement and examples of items include *I try hard to understand what I learn in school* and *Learning is fun for me*.

The original fifteen-item scale also reflected a third dimension of engaging in school to look good to others, however as this dimension was only measured in the Chinese sample we excluded it from analysis for consistency across samples. A composite score was obtained per subject, and higher values indicated higher levels of school engagement. Cronbach's alpha coefficient for the Chinese subscale was 0.73.

#### Data analysis

All statistical analyses were performed with Stata statistical software version 14 (StataCorp., 2015). Missing data in the U.S. sample ranged from 0.7 % - 15 %. Multiple imputation (MI) was used to address missingness. These are generated from 20 imputations of complete data sets (Royston, 2004). Imputed data was consistent with the original data, and results were consistent with the full series of analyses on both imputed and original data. To analyze data in the U.S. sample, we used multiple linear regression models to test our hypotheses. Adolescents' self-report racial and ethnicity backgrounds were included as covariates.

The Chinese sample's missing data was at a minimum level (0.8 % - 5 %), and multiple imputation (20 imputations) was also employed. Data in China was collected from 21 classrooms in 3 schools, and each classroom had 24-45 students. To account for variances due to random classroom effect, we used multi-level model (MLM) with classroom random intercept and school fixed-effect for analyses:  $Y_{ij} = a_{00} + b_{10}(X_{ij}) + u_{0j} + e_{ij}$ , where  $e_{ij} \sim N(0, \sigma_e^2)$ ,  $u_{0j} \sim N(0, \sigma_u^2)$ . The outcome  $Y_{ij}$  is the average of students in classroom  $j$  school  $i$  adjusting for the differences among schools in student-level demographic and predictors ( $X_{ij}$ ) (masculinity, school engagement, parental education) while allowing classroom intercepts in outcomes to vary randomly ( $u_{0j}$ ). With the unconditional means models, predicting the outcome variable with classroom intercept only, the intraclass correlation (ICC),  $\rho$  ( $\rho = \sigma_a^2 / (\sigma_a^2 + \sigma_b^2)$ ), and values were 0.40, warranting MLM being necessary to account for the classroom level random effects. Restricted maximum likelihood is used for MLM analyses.

To address the third research question, the conceptual mediation model for both samples was the same (see Fig. 1). For both samples, bootstrapping estimation with 100 resampled data sets was performed so that the null hypothesis of indirect effect could be rejected if the 95 % confidence interval did not include zero.

#### Results

We report our results separately for the United States and China, as we explore the patterns within each context as parallel inquiries rather than between-group comparisons. Descriptive analyses by adolescent gender are presented in Table 1 and Fig. 2. Bivariate correlations and reliabilities of measures in both samples are presented in Table 2.

#### United States

We observed significant gender differences in the U.S. sample across all measures: U.S. boys had higher levels of adherence to hegemonic masculine norms than girls, and girls had higher levels of school engagement and outperformed boys in academic performance across subjects. In line with our prediction, adherence to hegemonic masculinity was consistently and significantly negatively correlated with school engagement and academic performance; school engagement was positively correlated with academic performance.

#### Hegemonic masculinity and academic performance

The first research question examined associations between hegemonic masculinity and academic performance among boys and girls in each sample. In the first step, we tested a model with academic performance being the dependent variable, and gender, ethnicity as covariates. Results are summarized in Table 3 for the U.S. sample. As hypothesized, adherence to hegemonic masculinity was associated with lower academic performance in both samples. For U.S. youth, net of gender and ethnicity, the associations between 7th grade adherence to hegemonic masculinity and 8th grade academic performance ( $b = -2.79$ ,  $SE = 0.72$ ,  $p < .001$ ) was negative (see Table 3). The adjusted R-squared was 0.23, suggesting the models account for a significant amount of variances in the outcomes.

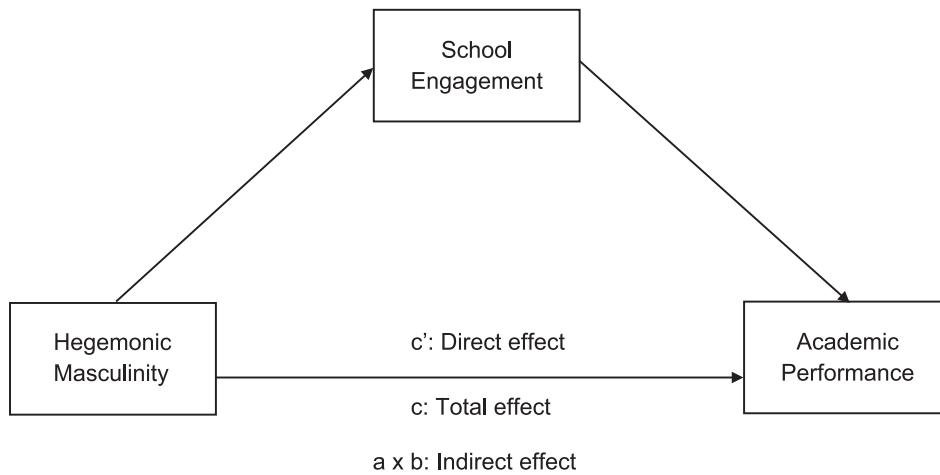


Fig. 1. Mediation model of hegemonic masculinity and academic performance in the United States and China.

**Table 1**  
Mean and standard deviations of key variables in the United States and China.

	The United States					China			
	Boy		Girl			Boy		Girl	
	<i>M</i>	<i>S.D.</i>	<i>M</i>	<i>S.D.</i>		<i>M</i>	<i>S.D.</i>	<i>M</i>	<i>S.D.</i>
Hegemonic masculinity***	2.23	0.44	1.96	0.48	Hegemonic masculinity***	2.20	0.54	2.06	0.46
School engagement***	2.66	0.58	2.90	0.55	School engagement	3.08	0.51	3.09	0.49
Academic performance***	83.96	8.82	86.82	8.00	Academic performance*	-1.37	13.81	1.30	11.34

Note. \* indicates significant differences by gender. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ .

While the direct associations between hegemonic masculinity and academic performance were confirmed, in line with our hypothesis for our second research question, results suggested that these associations did not vary by adolescent’s gender. As presented in Table 3, we found no significant gender interaction effects in any of the models in the U.S. sample.

*School engagement as a mediator*

The third research question addressed whether school engagement mediates the associations between hegemonic masculinity and academic performance. In the U.S. sample, all paths included adolescent’s gender and racial/ethnicity as covariates. Results are summarized in Table 5. After accounting for adolescent’s gender and ethnicity, the indirect effect ( $a \times b$ ) was negatively significant (indirect effect =  $-1.69$ ,  $SE = 0.21$ ,  $p < .001$ ). The total effect between hegemonic masculinity and academic performance was significant (total effect =  $-3.81$ ,  $SE = 0.46$ ,  $p < .001$ ), and adding school engagement as the mediator resulted in a slightly higher, but still significant  $p$ -value for the direct effect (direct effect =  $-2.12$ ,  $SE = 0.46$ ,  $p = .009$ ). The proportion of total effect mediated by the indirect effect was moderate: 44.44 %. These results suggest that school engagement partially mediates the relations between adherence to hegemonic masculinity and academic performance among U.S. adolescents.

*China*

In the Chinese sample, we observed gender differences in adherence to hegemonic masculinity and academic performance similar to those found in the United States: Boys reported higher adherence to hegemonic masculine norms, while girls outperformed boys academically. However, unlike in the United States, Chinese boys and girls reported comparable levels of school engagement. Similar to trends observed in the United States, adherence to hegemonic masculinity was consistently and significantly negatively correlated with school engagement and

academic performance, while school engagement was positively correlated with academic performance. The first research question examined associations between hegemonic masculinity and academic performance among boys and girls in each sample. In the first step, we tested a model with academic performance being the dependent variable, and gender, and school achieving level as covariates. Results are summarized in Table 4 for the Chinese sample.

*Hegemonic masculinity and academic performance*

Results similar to those in the U.S. sample were found in the Chinese sample. Net of all other variables in the model, 7th grade adherence to hegemonic masculinity was significantly and negatively associated with 8th grade academic performance ( $b = -1.86$ ,  $SE = 0.80$ ,  $p = .020$ ). Notably, the ICC value was 35.8 %, indicating that over one-third of unexplained variance in the test scores can be attributed to the random classroom effects on average.

For our second research question, in line with our hypotheses, results suggested that these associations did not vary by adolescent’s gender. As presented in Table 4, we found no significant gender interaction effects in any of the models in the Chinese sample.

*School engagement as a mediator*

The third research question addressed whether school engagement mediates the associations between hegemonic masculinity and academic performance. In the Chinese sample, mediations were tested in multi-level models in which classroom random intercepts and school fixed effects were included, as well as adolescents’ gender and parental education as covariates. Bootstrap analyses with 100 resampling iterations were performed, and bootstrapped standard error and 95 % percentile confidence interval were reported (we also obtained bias-corrected confidence intervals. Bias-corrected confidence interval results matched percentile confidence interval results). Results are summarized in Table 5. Similar to the U.S. sample, net of all other variables, the bootstrapped indirect effect was significant (indirect effect =  $-0.35$ ,  $SE$

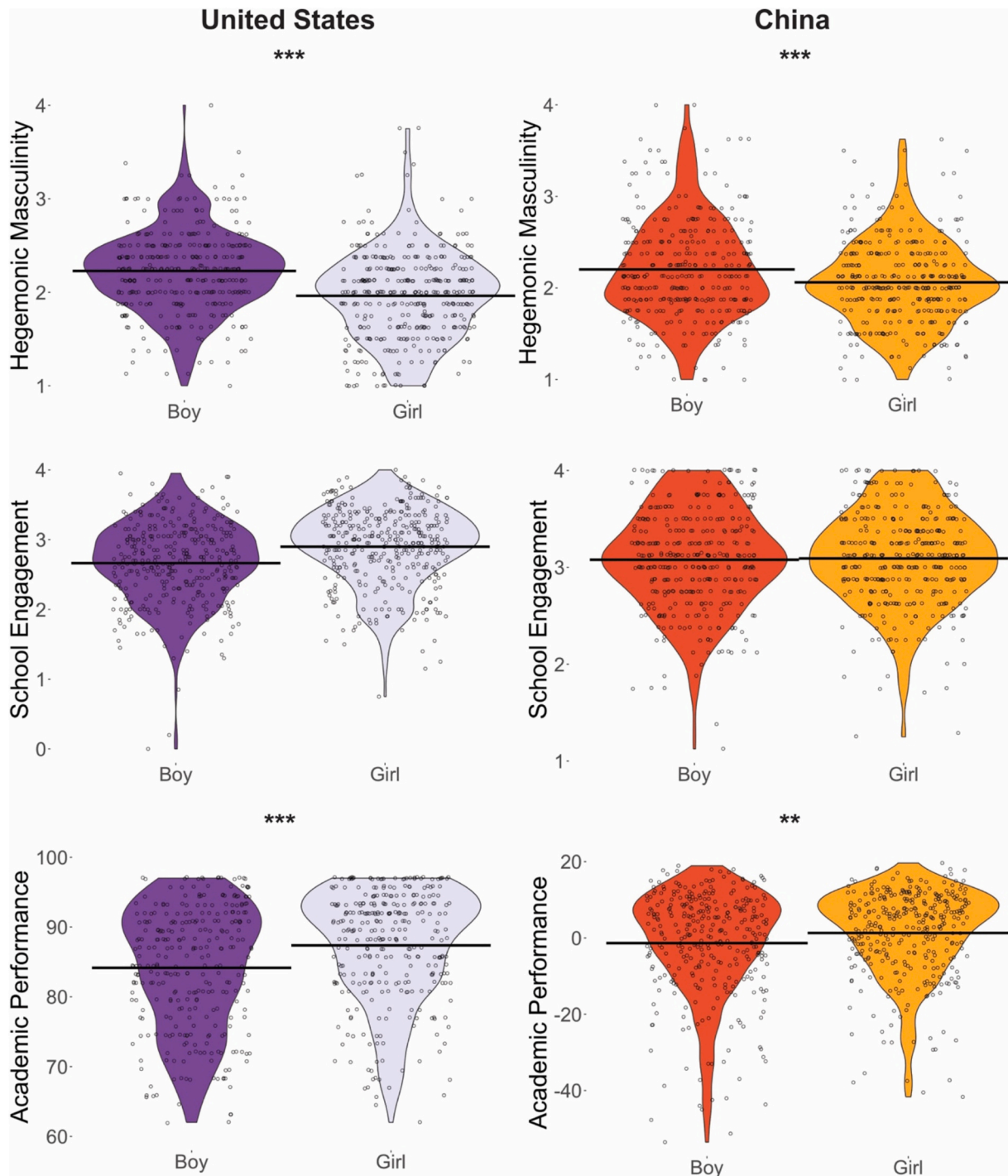


Fig. 2. Violin charts depicting individual variability (jitters) and group mean (horizontal bar) for U.S. and Chinese youth’s reports of hegemonic masculinity, school engagement, and academic performance. For averages of academic performance among the Chinese sample, scores are centered around individual school’s mean. \*\* $p < .01$ , \*\*\* $p < .001$ .

$= 0.14, p = .013$ . While the total effect between hegemonic masculinity and academic performance was significant (total effect =  $-1.86, SE = 0.74, p = .012$ ), adding school engagement as mediator resulted in a smaller coefficient in the direct effect (direct effect =  $-1.52, SE = 0.75, p = .041$ ). The proportion of the total effect mediated by the indirect effect was 18.59 %. These results suggest that school engagement partially mediates relations between Chinese adolescents’ adherence to hegemonic masculinity and their academic performance.

### Discussion

We examined associations between adolescents’ adherence to hegemonic masculine norms and academic performance and school engagement for boys and girls, and did so across the United States and China. Our study is one of the first to document relations between youth’s adherence to hegemonic masculine norms and their academic performance and school engagement in urban cities in China and the United States. Our results show that adherence to hegemonic masculine norms is negatively associated with academic performance for both U.S.

**Table 2**  
Correlation matrix for variables in the United States (below diagonal) and China (above diagonal).

	Hegemonic masculinity	School engagement	Academic performance
Hegemonic masculinity	–	–0.13***	–0.11**
School engagement	–0.33***	–	0.18***
Academic performance	–0.25***	0.39***	–

Note. Variables in italics are in the Chinese sample. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ .

**Table 3**  
U.S. sample: Hegemonic masculinity at 7th grade predicting academic performance at 8th grade with multiple regressions.

	<i>b</i>	<i>S.E.</i>	<i>p</i>	95 % <i>CI</i>	<i>b</i>	<i>S.E.</i>	<i>p</i>	95 % <i>CI</i>
Hegemonic masculinity	–2.79	0.72	0.000	[–4.22, –1.37]	–2.62	0.92	0.005	[–4.42, –0.79]
Youth’s gender	–2.00	0.58	0.001	[–3.14, –0.86]	–1.11	2.77	0.688	[–6.58, –4.36]
Latine	0.34	0.89	0.705	[–1.43, 2.11]	0.32	0.89	0.723	[–1.44, 2.07]
White	8.18	0.85	0.000	[6.50, 9.87]	8.18	0.85	0.000	[6.50, 9.87]
Chinese	3.85	0.88	0.000	[2.13, 5.58]	3.84	0.87	0.000	[2.12, 5.56]
Hegemonic masculinity x Gender					–0.42	1.29	0.744	[–2.71, 2.13]
Constant	89.02	1.71	0.000	[85.61, 92.43]	88.66	2.04	0.000	[85.61, 92.43]

Note. Beta coefficients are unstandardized estimates; Youth’s gender (0 = *girl*, 1 = *boy*); Adjusted R-squared is a mean estimated from results over 20 imputations; Reference group: African-American.  $N_s = 947$ .

and Chinese boys and girls. Moreover, these associations can be partially explained by school engagement, especially in the U.S. context. Notably, gender did not moderate relations in either context, suggesting that hegemonic masculine norms are similarly associated with academic performance and school engagement for boys and girls. Our study advances extant research by showing the negative influence of hegemonic masculinity on academic outcomes in two distinct societies, highlighting the role of cultural context in shaping the nature of these processes.

As hypothesized, we found 7<sup>th</sup> grade adherence to hegemonic masculinity was directly associated with lower academic performance in 8<sup>th</sup> grade across adolescents’ gender and nationality. Such findings align with prior scholarship suggesting a conflict between hegemonic masculine ideology and academic performance (Santos et al., 2013). Our results also support the idea that adolescents who adhere to hegemonic masculine norms may struggle to negotiate hegemonic masculine ideology with attitudes and behaviors required to be a successful student in school, and thus underperform academically as a consequence

(American Psychological Association and Boys and Men Guidelines Group, 2018; Santos et al., 2013). While boys on average may have higher levels of hegemonic masculinity norm adherence due to social values and pressure (e.g., Kindlon & Thompson, 1999) girls, too, are aware of, and endorse hegemonic masculine ideology (Rogers et al., 2020). In cultures where the construct of hegemonic masculinity is both prevalent and consistently increasing in influence (Connell, 1998, 2012; Song & Hird, 2014), girls are pressured to adhere to hegemonic masculine norms to demonstrate socially esteemed emotional stoicism and self-reliance. In fact, a recognized strategy for girls to obtain status and power in both U.S. and Chinese patriarchal culture is to “be one of the boys,” and thus appropriate attitudes and behaviors they witness as empowering to boys and men (Paechter, 2006; Xu & Yeung, 2013). Yet, our results, along with previous findings that adolescent girls’ adherence to hegemonic masculine norms is linked to lower psychological and social well-being in the United States and China (Rogers et al., 2020), suggest that endorsing hegemonic masculinity may not benefit girls

**Table 4**  
Chinese sample: 7th grade hegemonic masculinity predicting 8th grade academic performance in China with multi-level modeling.

	<i>b</i>	<i>S.E.</i>	<i>p</i>	95 % <i>CI</i>	<i>b</i>	<i>S.E.</i>	<i>p</i>	95 % <i>CI</i>
Hegemonic masculinity	–1.86	0.80	0.020	[–3.42, –0.29]	–1.50	1.22	0.218	[–3.89, 0.89]
Youth’s gender	–1.98	0.81	0.014	[–3.56, –0.40]	–0.67	3.56	0.851	[–7.65, 6.31]
Parental education: High school	0.74	1.36	0.587	[–1.96, 3.44]	0.73	1.37	0.597	[–1.98, 3.44]
Parental education: College	3.36	1.50	0.027	[0.39, 6.33]	3.35	1.51	0.028	[0.36, 6.33]
Constant	3.38	2.61	0.195	[–1.73, 8.49]	2.66	3.22	0.409	[–3.65, 8.97]
Hegemonic masculinity x Gender					–0.62	1.64	0.708	[–3.84, 2.60]
ICC			35.8 %				35.8 %	

Note. Beta coefficients are unstandardized estimates; Youth’s gender (0 = *girl*, 1 = *boy*); Reference group: parental education with middle school or lower.

**Table 5**  
Direct and indirect effects of hegemonic masculinity predicting academic performance in the United States and China.

	The United States				China			
	<i>b</i>	<i>S.E.</i>	<i>p</i>	95 % <i>CI</i>	<i>b</i>	<i>S.E.</i>	<i>p</i>	95 % <i>CI</i>
Academic performance								
Path a	–0.36	0.04	0.000	[–0.43, –0.28]	–0.12	0.03	0.000	[–0.19, –0.05]
Path b	4.75	0.44	0.000	[3.89, 5.61]	2.85	0.79	0.000	[1.31, 4.40]
Direct effect	–2.12	0.46	0.009	[–3.02, –1.21]	–1.52	0.75	0.041	[–2.99, –0.06]
Total effect	–3.81	0.46	0.000	[–4.71, –2.91]	–1.86	0.74	0.012	[–3.31, –0.41]
Indirect effect	–1.69	0.21	0.000	[–2.10, –1.29]	–0.35	0.14	0.013	[–0.62, –0.07]
Proportion mediated	44.44 %				18.59 %			

Note. Reported are unstandardized coefficients from bootstrapping estimates (100 reps). Youth’s gender, race/ethnicity (U.S. sample) and parental education (Chinese sample) were included in mediation models.

socioemotionally or academically. As such, constructing female empowerment around urging girls to adhere to the hegemonic masculine norms that have already shown negative effects for boys may prove counterproductive, also in school contexts.

We found U.S. and Chinese adolescents' school engagement partially mediated the association between adherence to hegemonic masculine norms and academic performance. Hegemonic masculine norms in Western contexts have been associated with consciously displaying lack of effort and exuding an aloof sense of "cool" in school (Jackson & Dempster, 2009; Morris, 2008, 2011). As part of their commitment to the hegemonic masculine ideology present in their culture, U.S. adolescents may feel inclined to self-report as disengaged and "bored" in school, not "trying hard" and struggling to stay focused in class. While such attitudes and behaviors may be rewarded among like-minded peers and in many contexts outside of school where hegemonic masculine ideology is privileged, they risk influencing academic performance and long-term education and career prospects by suppressing school engagement and striving. For example, researchers have pointed to student attitudes and interactions in school contexts as possible domains where hegemonic masculine norms could interfere with youth's level of school engagement (e.g., Leaper et al., 2019). Specifically, "trying hard" at learning and being involved in school signal not only emotional commitment but also vulnerability (Rogers, Updegraff, et al., 2017), which boys and girls adhering to hegemonic masculine norms may struggle to display openly. Finally, students exhibiting hegemonic masculine attitudes and behaviors may be met with lower teacher expectations and higher sanctions in the school context than students who conform less to hegemonic masculine norms, which in turn may influence how engaged they are in the classroom (Lopez, 2002).

In the Chinese sample, the mediation effect of school engagement was smaller compared to that in the U.S. sample. Several factors might contribute to this difference. First, while all measures in the U.S. sample were self-reports, academic performance in the Chinese sample was measured through test scores from official school records, potentially resulting in smaller effect sizes. Second, Chinese culture is deeply rooted in Confucianism whose teachings have long equated education, and thus also school engagement, with a higher sense of morality (Lee, 2000). Enjoying and putting effort into school is therefore encouraged and desirable for all Chinese youth, regardless of gender. Indeed, while girls in our U.S. sample showed higher levels of school engagement than boys, we found no such differences between Chinese boys and girls (see Table 1). However, the higher cultural value of school in China might have led adolescents in our Chinese sample to report inflated levels of school engagement, in turn reducing the relation between adherence to hegemonic masculinity and test scores. As such, to further understand the impact of hegemonic masculine norms on school engagement, future studies would benefit from using teacher reports of students' level of engagement in school. Nevertheless, our data provide evidence challenging the increasingly popular approach endorsed by Chinese educators and parents, which prescribes cultivating and strengthening boys' hegemonic masculinity to boost their academic achievement (Paulo, 2018; Zhu et al., 2022).

#### *Implications for policy and practice*

Our study has implications for policy and practice. In recent years, a discourse has emerged in Chinese and international media about a "boy crisis," highlighting concerns over the feminization of Chinese boys, with some attributing this trend to the influence of school (Zhu et al., 2022). In response, China's Education Ministry has implemented measures to cultivate hegemonic masculinity in male students. Such efforts include boosting physical education, encouraging single-sex schools, and hiring male teachers as role models for boys (Hernández, 2016). Our findings, however, suggest that policies that encourage adherence to hegemonic masculinity among youth may, in fact, be harmful to youth's academic outcomes. Instead, educators can develop and implement

programs that challenge hegemonic masculine norms, such as instituting curriculum components that encourage empathy, cooperation, and connection (Way, 2024). Relatedly, educational institutions can provide training for teachers to recognize and address the negative impacts of adherence to hegemonic masculine norms. At the school level, policies can better cultivate environments that encourage and value diverse expressions of gender, thus alleviating pressure on students to conform to hegemonic masculine norms. Schools can leverage insights and support from the communities by engaging parents and community members in discussions about the impacts of hegemonic masculine norms on academic performance. Parents and caregivers, particularly fathers and male caregivers, can benefit from education about the psychology of masculinities to better support youth's resistance to harmful aspects of masculinity, and construct more inclusive, caring contexts for boys (Way, 2024). Indeed, caring masculinities could be alternative ways of "doing masculinity" in communities, and thus encouraged by schools. Caring masculinities reject domination and its associated traits while instead embracing values of care, including positive emotion, interdependence, and relationality (Elliott, 2016). Clinicians working with youth could be aware of the degree to which adherence to hegemonic masculine norms shapes their outcomes in school and beyond. Ultimately, efforts to foster healthier masculinities should be situated within broader societal shifts aimed at disentangling educational capacities from culturally constructed gender norms and addressing the hierarchies associated with hegemonic masculinity.

#### *Limitations and future directions*

Our study is situated between two time points at the border of pre-adolescence and adolescence. This is a period marked by intensified engagement with gender norms, coinciding with increasing academic demands. Although the design of our study did not test relations beyond these two timepoints, our finding of macro-level, ideological effects on individual learning spotlights ways that youth's outcomes across two waves in adolescence are shaped by their proximal and distal contexts. However, to further establish directionality, future longitudinal research could build on the present work by examining the influence of hegemonic masculine norms on academic outcomes across several years, and as youth progress further into adolescence. Such work could also include additional controls in their models, such as prior waves of academic achievement.

In the present study, we predicted that adherence to hegemonic masculinity norms would influence school engagement and academic performance across two distinct cultural settings, the United States and China. Although we found support for this prediction, the mediation effects of school engagement manifested differently by context, suggesting that while certain dynamics are consistent across the two countries, others may reflect culturally specific forms of engagement with hegemonic masculine norms and academic traditions. Importantly, because our analytic approach does not involve multigroup modeling, we cannot make statistical inferences about similarities or differences between findings in our U.S. and Chinese samples. However, the parallel structure of the study allows for exploratory insight into how shared developmental processes may interact with distinct cultural systems and settings to shape academic trajectories. Future research may pursue multigroup analysis to clarify these patterns further.

Most of our measures were self-reports, many conformed to a single-factor structure, and certain measure items differed slightly across countries. Although we addressed most of these limitations in our previous work (Rogers et al., 2020), future studies should consider whether to complement the present measures with alternatives. For example, to avoid conflating academic performance with school engagement, academic performance may be better measured through school-reported test scores instead of grades (as was done for the Chinese sample in the present work). Grades may be assigned based on school engagement, in addition to academic performance. Additionally, in the present study,

we described the mechanisms that past scholars suggest may drive the relation between adherence to hegemonic masculine norms and lower academic performance. However, we were only able to capture school engagement as a possible mediator. Help-seeking behaviors in the classroom (Leaper et al., 2019; Rogers, Updegraff, et al., 2017) may be another important mediator in this relation and, as such, a generative area for future scholars to investigate.

Although school engagement has been conceptualized as comprising behavioral, emotional, and cognitive dimensions (Christenson et al., 2012), our measure of school engagement only captures the behavioral and emotional components. This choice partially aligns with our assessment of hegemonic masculinity, which, as it is measured in our work, also taps into emotional and behavioral facets of development. Future research may benefit from incorporating additional dimensions to provide a more comprehensive picture of how hegemonic masculine norms influence academic outcomes on multiple facets.

Finally, our sample comprises racially and ethnically diverse adolescents from densely populated urban cities in two industrialized countries. It is possible that hegemonic masculine norms may be emphasized to different degrees depending on location. We therefore urge future researchers to consider—and test—how geographical context may shape the relations found in the current study.

## Conclusion

The developmental field increasingly highlights associations between adherence to hegemonic masculine norms and socioemotional outcomes (e.g., American Psychological Association and Boys and Men Guidelines Group, 2018; Gupta et al., 2013; Rogers et al., 2020; Wong et al., 2017). Our analyses add to this important body of work by demonstrating that adherence to hegemonic masculine ideology relates to poorer adjustment in other areas important to human thriving, such as academic performance and school engagement. Furthermore, we show that associations between adherence to hegemonic masculine norms and academic performance and school engagement are similar for boys and girls, as well as across the United States and China. Commonalities in patterns between these populations are critical, as academic performance and school engagement have long been established as predictors of successful work force involvement and general well-being in adulthood (e.g., Julian & Kominski, 2011; Meara et al., 2008; Ross & Wu, 1995) and are, as such, important factors guiding the nature of adolescents' developmental transition into young adulthood. This, in turn, underscores the necessity to better understand how hegemonic masculine ideology may interfere with multiple aspects of adjustment, not just socioemotional wellbeing, and to do so in youth from multiple backgrounds and in multiple contexts.

## CRedit authorship contribution statement

**Anna Bennet:** Writing – review & editing, Writing – original draft, Project administration, Formal analysis, Data curation, Conceptualization. **Rui Yang:** Writing – review & editing, Validation, Methodology, Formal analysis, Data curation, Conceptualization. **Angelica Ferrara:** Writing – review & editing, Writing – original draft. **Yana Kuchirko:** Writing – review & editing, Visualization. **Niobe Way:** Supervision, Funding acquisition, Conceptualization. **Diane Hughes:** Funding acquisition.

## Declaration of competing interest

We have no known conflict of interest to disclose.

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## Data availability

Data will be made available on request.

## References

- Addis, M. E., & Mahalik, J. R. (2003). Men, masculinity, and the contexts of help seeking. *American Psychologist*, 58(1), 5–14. <https://doi.org/10.1037/0003-066X.58.1.5>
- Ahlqvist, S., Halim, M. L., Greulich, F. K., Lurye, L. E., & Ruble, D. (2013). The potential benefits and risks of identifying as a tomboy: A social identity perspective. *Self and Identity*, 12(5), 563–581. <https://doi.org/10.1080/15298868.2012.717709>
- American Psychological Association, & Boys and Men Guidelines Group. (2018). APA guidelines for psychological practice with boys and men. Retrieved from <http://www.apa.org/about/policy/psychological-practice-boys-men-guidelines.pdf>.
- Bennet, A., Kuchirko, Y., Halim, M. L., Costanzo, P. R., & Ruble, D. (2020). The influence of center-based care on young children's gender development. *Journal of Applied Psychology*, 69. <https://doi.org/10.1016/j.appdev.2020.101157>
- Bronfenbrenner, U., & Morris, P. A. (2007). The bioecological model of human development. In W. Damon, R. M. Lerner, & R. M. Lerner (Eds.), *Handbook of child psychology: Theoretical models of human development*. <https://doi.org/10.1002/9780470147658.chpsy0114>
- Brown, L. M. (2003). *Girlfighting: Betrayal and rejection among girls*. New York, NY: New York University Press.
- Brown, L. M., & Gilligan, C. (1992). *Meeting at the crossroads: Women's psychology and girls' development*. Cambridge, MA: Harvard University Press.
- Budgeon, S. (2014). The dynamics of gender hegemony: Femininities, masculinities and social change. *Sociology*, 48(2), 317–334. <https://doi.org/10.1177/0038038513490358>
- Burke, P. J. (1989). Gender identity, sex, and school performance. *Social Psychology Quarterly*, 52(2), 159–169. <https://doi.org/10.2307/2786915>
- Chase, P. A., Hilliard, L. J., Geldhof, G. J., Warren, D. J., & Lerner, R. M. (2014). Academic achievement in the high school years: The changing role of school engagement. *Journal of Youth and Adolescence*, 43, 884–896. <https://doi.org/10.1007/s10964-013-0085-4>
- Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling*, 14(3), 464–504. <https://doi.org/10.1080/10705510701301834>
- Christenson, S. L., Reschly, A. L., Wylie, C., & (Eds.). (2012). *Handbook of research on student engagement*. Springer Science + Business Media. <https://doi.org/10.1007/978-1-4614-2018-7>
- Chung-Hall, J., & Chen, X. (2010). Aggressive and prosocial peer group functioning: Effects on children's social, school, and psychological adjustment. *Social Development*, 19(4), 659–680. <https://doi.org/10.1111/j.1467-9507.2009.00556.x>
- Coll, C. G., Lamberty, G., Jenkins, R., Pipes, H. M., Crnic, K., Wasic, B. H., & Garcia, H. V. (1996). An integrative model for the study of developmental competencies in minority children. *Child Development*, 67(5), 1891–1914. <https://doi.org/10.2307/1131600>
- Connell, R. W. (1998). Masculinities and globalization. In *1. Men and masculinities* (pp. 3–23). <https://doi.org/10.1177/1097184X98001001001>
- Connell, R. W. (2012). Masculinity research and global change. *Masculinities & Social Change*, 1(1), 4–18. <https://doi.org/10.4471/mcs.2012.01>
- Connell, R. W., & Messerschmidt, J. W. (2005). Hegemonic masculinity: Rethinking the concept. *Gender and Society*, 19(6), 829–859. <http://www.jstor.org/stable/27640853>.
- Dunlap, S. T., & Barth, J. M. (2023). Career identities and gender-STEM stereotypes: When and why implicit gender-STEM associations emerge and how they affect women's college major choice. *Sex Roles: A Journal of Research*, 89(1–2), 19–34. <https://doi.org/10.1007/s11199-023-01381-x>
- Elliott, K. (2016). Caring masculinities: Theorizing an emerging concept. *Men and Masculinities*, 19(3), 240–259. <https://doi.org/10.1177/1097184X15576203>
- Evans, H. (2002). Past, perfect or imperfect; changing images of the ideal wife. In S. Brownell, & J. N. Wasserstrom (Eds.), *Chinese femininities/Chinese masculinities: A reader* (pp. 335–360). Berkeley, CA: University of California Press.
- Feder, J., Levant, R. F., & Dean, J. (2010). Boys and violence: A gender-informed analysis. *Psychology of Violence*, 1(S), 3–12. <https://doi.org/10.1037/2152-0828.1.S.3>
- Gilligan, C. (2011). *Joining the resistance*. Polity Press.
- Gini, G., & Pozzoli, T. (2006). The role of masculinity in children's bullying. *Sex Roles*, 54, 585–588. <https://doi.org/10.1007/s11199-006-9015-1>
- Goldstein, S. E., Boxer, P., & Rudolph, E. (2015). Middle school transition stress: Links with academic performance, motivation, and school experiences. *Contemporary School Psychology*, 19(1), 21–29. <https://doi.org/10.1007/s40688-014-0044-4>
- Gupta, T., Way, N., Hughes, D., Jia, Y., Chen, X., McGill, R. K., ... Deng, H. (2013). Gender-typed behaviors in friendships and well-being: A cross-cultural study of Chinese and American boys. *Journal of Research on Adolescence*, 23(1), 57–68. <https://doi.org/10.1111/j.1532-7795.2012.00824.x>
- Halim, M. L., Ruble, D. N., & Amodio, D. M. (2011). From pink frilly dresses to “one of the boys”: A social-cognitive analysis of gender identity development and gender bias. *Social and Personality Psychology Compass*, 5(11), 933–949. <https://doi.org/10.1111/j.1751-9004.2011.00399.x>
- Hernández, J. C. (2016, Feb 6). *Wanted in China: More male teachers, to make boys men*. The New York Times. Retrieved from <https://www.nytimes.com/2016/02/07/world/asia/wanted-in-china-more-male-teachers-to-make-boys-men.html>.

- Heyder, A., & Kessels, U. (2015). Do teachers equate male and masculine with lower academic engagement? How students' gender enactment triggers gender stereotypes at school. *Social Psychology of Education: An International Journal*, 18, 467–485. <https://doi.org/10.1007/s11218-015-9303-0>
- Heyder, A., & Kessels, U. (2017). Boys don't work? On the psychological benefits of showing low effort in high school. *Sex Roles*, 77, 72–85. <https://doi.org/10.1007/s11199-016-0683-1>
- Hu, T., & Guan, T. (2021). "Man-as-nation": Representations of masculinity and nationalism in Wu Jing's wolf warrior II. *SAGE Open*, 11(3). <https://doi.org/10.1177/21582440211033557>, 2158244021103355.
- Huang, X. (2018). *The gender legacy of the Mao era: Women's life stories in contemporary China*. State University of New York Press.
- Jackson, C., & Dempster, S. (2009). I sat back on my computer...with a bottle of whisky next to me: Constructing 'cool' masculinity through 'effortless' achievement in secondary and higher education. *Journal of Gender Studies*, 18(4), 341–356. <https://doi.org/10.1080/09589230903260019>
- Julian, T., & Kominski, R. (2011). Education and synthetic work-life earnings estimates. In *American community survey reports. ACS-14*. US Census Bureau.
- Kessler, S. J., Ashenden, D. J., Connell, R. W., & Dowsett, G. W. (1982). *Ockers and disco-maniacs*. Sydney, Australia: Inner City Education Center.
- Kimmel, M. S. (2008). *Guyland: The perilous world where boys become men*. New York: HarperCollins.
- Kimmel, M. S., & Mahler, M. (2003). Adolescent masculinity, homophobia, and violence: Random school shootings, 1982-2001. *American Behavioral Scientist*, 46(10), 1439–1458. <https://doi.org/10.1177/0002764203251484>
- Kindlon, D., & Thompson, M. (1999). *Raising Cain: Protecting the emotional life of boys*. New York, NY: Ballantine Books.
- Kornienko, O., Santos, C. E., Martin, C. L., & Granger, K. L. (2016). Peer influence on gender identity development in adolescence. *Developmental Psychology*, 52(10), 1578–1592. <https://doi.org/10.1037/dev0000200>
- Lazaro, V., & Bian, L. (2024). Children's social preference for peers engaged in brilliance-required activities: The impact of gender and race. *Developmental Psychology*, 60(2), 2233–2241. <https://doi.org/10.1037/dev0001822>
- Leaper, C., Farkas, T., & Starr, C. R. (2019). Traditional masculinity, help avoidance, and intrinsic interest in relation to high school students' English and math performance. *Psychology of Men & Masculinity*, 20(4), 603–611. <https://doi.org/10.1037/men0000188>
- Lee, T. H. (2000). *Education in traditional China: A history* (Vol. 13). Brill.
- Levant, R. F., & Richmond, K. (2008). A review of research on masculinity ideologies using the male role norms inventory. *The Journal of Men's Studies*, 15(2), 130–146. <https://doi.org/10.3149/jms.1502.130>
- Liu, F. (2013). From degendering to (re)gendering the self: Chinese youth negotiating modern womanhood. *Gender and Education*, 26(1), 18–34. <https://doi.org/10.1080/09540253.2013.860432>
- Lopez, N. (2002). *Hopeful girls, troubled boys: Race and gender disparity in urban education*. New York, NY: Routledge.
- Louie, K. (2002). *Theorising Chinese masculinity: Society and gender in China*. Cambridge, UK: Cambridge University Press.
- Louie, K. (2015). *Chinese masculinities in a globalizing world*. New York, NY: Routledge.
- Louie, K. (2024). The Nianpao (effeminate men) controversy in China: How to be a real man in the family, school and society. *Women's Studies International Forum*, 102, Article 102861. <https://doi.org/10.1016/j.wsf.2023.102861>
- Ma, G., Yang, C., Qin, Z., & Guo, M. (2021). Hegemonic masculinity in East Asia: China, South Korea and Japan. In *Proceedings of the 2021 4th international conference on humanities education and social sciences (ICHESS 2021)* (pp. 2405–2410). <https://doi.org/10.2991/assehr.k.211220.416>
- Ma, Y. (2024). Secondary education (middle school) in China. In L. Niancai, F. Zhuolin, & W. Qi (Eds.), *Education in China and the world*. Singapore: Springer. [https://doi.org/10.1007/978-981-99-5861-0\\_3](https://doi.org/10.1007/978-981-99-5861-0_3)
- Mahalik, J. R., Locke, B. D., Ludlow, L. H., Diemer, M. A., Scott, R. P., Gottfried, M., & Freitas, G. (2003). Development of the conformity to masculine norms inventory. *Psychology of Men & Masculinity*, 4(1), 3–25. <https://doi.org/10.1037/1524-9220.4.1.3>
- Marrs, H. (2016). Conformity to masculine norms and academic engagement in college men. *Psychology of Men & Masculinity*, 17(2), 197–205. <https://doi.org/10.1037/men0000015>
- Martin, C. L., & Ruble, D. (2004). Children's search for gender cues: Cognitive perspectives on gender development. *Current Directions in Psychological Science*, 13(2), 67–70. <https://doi.org/10.1111/j.0963-7214.2004.00276.x>
- Mascia, M. L., Langiu, G., Bonfiglio, N. S., Penna, M. P., & Cataudella, S. (2023). Challenges of preadolescence in the school context: A systematic review of protective/risk factors and intervention Programmes. *Education in Science*, 13(2), 130. <https://doi.org/10.3390/educsci13020130>
- McLean, K. C., Shucard, H., & Syed, M. (2016). Applying the master narrative framework to gender identity development in emerging adulthood. *Emerging Adulthood*, 5(2), 93–105. <https://doi.org/10.1177/2167696816656254>
- Meara, E. R., Richards, S., & Cutler, D. M. (2008). The gap gets bigger: Changes in mortality and life expectancy, by education, 1981-2000. *Health Affairs*, 27(2), 350–360. <https://doi.org/10.1377/hlthaff.27.2.350>
- Morris, E. W. (2008). "Rednecks," "Rutters," and "Rithmetic: Social Class, Masculinity, and Schooling in a Rural Context. *Gender & Society*, 22(06), 728–751. <https://doi.org/10.1177/0891243208325163>
- Morris, E. W. (2011). Bridging the gap: 'Doing gender', 'hegemonic masculinity', and the educational troubles of boys. *Sociology Compass*, 5(1), 92–103. <https://doi.org/10.1111/j.1751-9020.2010.00351.x>
- Morris, E. W. (2012). *Learning the hard way: Masculinity, place, and the gender gap in education*. Rutgers University Press.
- Nayak, A. (2023). Decolonizing care: Hegemonic masculinity, caring masculinities, and the material configurations of care. *Men and Masculinities*, 26(2), 167–187. <https://doi.org/10.1177/1097184X231166900>
- Olliffe, J. L., & Phillips, M. J. (2008). Men, depression and masculinities: A review and recommendations. *Journal of Men's Health*, 5(3), 194–202. <https://doi.org/10.1016/j.jomh.2008.03.016>
- O'Neil, J. M. (2012). The psychology of men. In E. M. Altmaier, & J.-I. C. Hansen (Eds.), *Oxford library of psychology. The Oxford handbook of counseling psychology* (pp. 375–408). Oxford University Press.
- Paechter, C. (2006). Masculine femininities/feminine masculinities: Power, identities and gender. *Gender and Education*, 18(3), 253–263. <https://doi.org/10.1080/09540250600667785>
- Paechter, C., & Clark, S. (2007). Learning gender in primary school playgrounds: Findings from the tomboy identities study. *Pedagogy, Culture & Society*, 15(3), 317–331. <https://doi.org/10.1080/14681360701602224>
- Paulo, D. A. (2018, October 27). "Masculinity crisis" in China lead parents to enroll kids in boot camp. Channel News Asiaw. Retrieved from <https://www.channelnewsasia.com/news/cnainsider/masculinity-crisis-china-leads-parents-enrol-boys-boot-camp-10869716>.
- Perdue, N. H., Manzeske, D. P., & Estell, D. B. (2009). Early predictors of school engagement: Exploring the role of peer relationships. *Psychology in the Schools*, 46(10), 1084–1097. <https://doi.org/10.1002/pits.20446>
- Pleck, J. H., Sonenstein, F. L., & Ku, L. C. (1993). Masculinity ideology: Its impact on adolescent males' heterosexual relationships. *Journal of Social Issues*, 49(3), 11–29. <https://doi.org/10.1111/j.1540-4560.1993.tb01166.x>
- Pollack, W. S. (1998). *Real boys: Rescuing our sons from the myths of boyhood*. New York, NY: Henry Hold and Company, LLC.
- Prentice, D. A., & Carranza, E. (2002). What women should be, shouldn't be, are allowed to be, and don't have to be: The contents of prescriptive gender stereotypes. *Psychology of Women Quarterly*, 26(4), 269–281. <https://doi.org/10.1111/1471-6402.t01-1-00066>
- Renold, E. (2001). Learning the "hard" way: Boys, hegemonic masculinity and the negotiation of learner identities in the primary school. *British Journal of Sociology of Education*, 22(3), 369–385. <https://doi.org/10.1080/01425690120067980>
- Rogers, A. A., DeLay, D., & Martin, C. L. (2017). Traditional masculinity during the middle school transition: Associations with depressive symptoms and academic engagement. *Journal of Youth and Adolescence*, 46, 709–724. <https://doi.org/10.1007/s10964-016-0545-8>
- Rogers, A. A., Updegraff, K. A., Santos, C. E., & Martin, C. L. (2017). Masculinity and school adjustment in middle school. *Psychology of Men & Masculinity*, 18(1), 50–61. <https://doi.org/10.1037/men0000041>
- Rogers, L. O., Niwa, E. Y., Chung, K., Yip, T., & Chae, D. (2021). M(ai)cro: Centering the macrosystem in human development. *Human Development*, 65(5–6), 270–292. <https://doi.org/10.1159/000519630>
- Rogers, L. O., & Way, N. (2018). Reimagining social and emotional development: Accommodation and resistance to dominant ideologies in the identities and friendships of boys of color. *Human Development*, 61(6), 311–331. <https://doi.org/10.1159/000493378>
- Rogers, L. O., Yang, R., Way, N., Weinberg, S. L., & Bennet, A. (2020). "We're supposed to look like girls, but act like boys": Adolescent girls' adherence to masculinity norms. *Journal of Research on Adolescence*, 30(S1), 270–285. <https://doi.org/10.1111/jora.12475>
- Roorda, D. L., Koomen, H. M. Y., Spilt, J. L., & Oort, F. J. (2011). The influence of affective teacher-student relationships on students' school engagement and achievement: A meta-analytic approach. *Review of Educational Research*, 81(4), 493–529. <https://doi.org/10.3102/0034654311421793>
- Ross, C. E., & Wu, C. (1995). The links between education and health. *American Sociological Review*, 60(5), 719–745. <https://doi.org/10.2307/2096319>
- Royston, P. (2004). Multiple imputation of missing values. *The Stata Journal*, 4(3), 227–241. <https://doi.org/10.1177/1536867X0400400301>
- Ryan, A. M., & Pintrich, P. R. (1997). "Should I ask for help?" the role of motivation and attitudes in adolescents' help seeking in math class. *Journal of Educational Psychology*, 89(2), 329–341. <https://doi.org/10.1037/0022-0663.89.2.329>
- Sanders, J. M. (2011). Coming of age: How adolescent boys construct masculinities via substance use, juvenile delinquency, and recreation. *Journal of Ethnicity in Substance Abuse*, 10(1), 48–70. <https://doi.org/10.1080/15332640.2011.547798>
- Santos, C. E., Galligan, K., Pahlke, R., & Fabes, R. A. (2013). Gender-typed behaviors, achievement, and adjustment among racially and ethnically diverse boys during early adolescence. *American Journal of Orthopsychiatry*, 83(2–3), 252–264. <https://doi.org/10.1111/ajop.12036>
- Song, G. (2022). "Little fresh meat": The politics of sissiness and sissyphobia in contemporary China. *Men and Masculinities*, 25(1), 68–86. <https://doi.org/10.1177/1097184X2111014939>
- Song, G., & Hird, D. (2014). *Men and masculinities in contemporary China*. Boston, MA: Brill. <https://doi.org/10.1163/9789004264915>
- Spencer, M. B., Dupree, D., & Hartmann, T. A. (1997). A phenomenological variant of ecological systems theory (PVEST): A self-organization perspective in context. *Development and Psychopathology*, 9(4), 817–833. <https://doi.org/10.1017/s0954579497001454>
- Starr, C. R., & Simpkins, S. D. (2021). High school students' math and science gender stereotypes: Relations with their STEM outcomes and socializers' stereotypes. *Social Psychology of Education: An International Journal*, 24(1), 273–298. <https://doi.org/10.1007/s11218-021-09611-4>
- StataCorp.. (2015). *Stata statistical software: Release 14*. College Station, TX: StataCorp LP.

- Sun, J., Dunne, M. P., Hou, X., & Xu, A. (2013). Educational stress among Chinese adolescents: Individual, family, school and peer influences. *Educational Review*, 65(3), 284–302. <https://doi.org/10.1080/00131911.2012.659657>
- Syed, M., & McLean, K. C. (2022). Who gets to live the good life? Master narratives, identity, and well-being within a marginalizing society. *Journal of Research in Personality*, 100, 1–7. <https://doi.org/10.1016/j.jrp.2022.104285>
- Syed, M., & McLean, K. C. (2023). Master narrative methodology: A primer for conducting structural-psychological research. *Cultural Diversity & Ethnic Minority Psychology*, 29(1), 53–63. <https://doi.org/10.1037/cdp0000470>
- Ueno, K., & McWilliams, S. (2010). Gender-typed behaviors and school adjustment. *Sex Roles*, 63, 580–591. <https://doi.org/10.1007/s11199-010-9839-6>
- Uy, P. J., Massoth, N. A., & Gottdiener, W. H. (2014). Rethinking male drinking: Traditional masculine ideologies, gender-role conflict, and drinking motives. *Psychology of Men & Masculinity*, 15(2), 121–128. <https://doi.org/10.1037/a0032239>
- Wang, S. (2013, October 12). The 20 standards for nü-hanzi, the more advanced tier is “female warrior” [女汉子20条标准出炉 更高级别是“女壮士”]. *Chinanews* <https://www.chinanews.com.cn/sh/2013/10-12/5371867.shtml>.
- Way, N. (2011). *Deep Secrets*. Cambridge, MA: Harvard University Press.
- Way, N. (2024). *Rebels with a cause: Reimagining boys, ourselves, and our culture*. New York, New York: Dutton.
- Way, N., Cressen, J., Bodian, S., Preston, J., Nelson, J., & Hughes, D. (2014). “It might be nice to be a girl...then you wouldn’t have to be emotionless”: Boys’ resistance to norms of masculinity during adolescence. *Psychology of Men & Masculinity*, 15(3), 241–252. <https://doi.org/10.1037/a0037262>
- Wellborn, J. G., & Connell, J. P. (1987). *Manual for the Rochester assessment package for schools*. Rochester, NY: University of Rochester.
- Wong, Y. J., Ho, M. R., Wang, S. Y., & Miller, I. S. (2017). Meta-analyses of the relationship between conformity to masculine norms and mental health-related outcomes. *Journal of Counseling Psychology*, 64(1), 80–93. <https://doi.org/10.1037/cou0000176>
- Xu, Q., & Yeung, W. J. J. (2013). Hoping for a phoenix: Shanghai fathers and their daughters. *Journal of Family Issues*, 34(2), 184–209. <https://doi.org/10.1097/CHI.0b013e3181bc72f8>
- Yang, R., Waters, T. E. A., Gu, Y., Way, N., Yoshikawa, H., Chen, X., ... Deng, H. (2024). Developmental antecedents of adherence to masculinity norms: A 9-year longitudinal study of urban Chinese families. *Developmental Psychology*, 60(6), 1097–1108. <https://doi.org/10.1037/dev0001748>
- Zhu, G., Zhang, A., Cheng, L., Shi, K., & Wang, Y. (2022). “Saving our boys!”: Do Chinese boys have a masculinity crisis? *ECNU Review of Education*. <https://doi.org/10.1177/20965311221113594>, 209653112211135.