



Birth Cohort Effects, Regions Differences, and Gender Differences in Chinese College Students' Aggression: A Review and Synthesis

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Abstract

This cross-temporal meta-analysis involved 86 studies ($N=71,397$) on aggression among Chinese college students conducted from 2003 to 2017. We collected articles investigating college students' aggression using the Aggression Questionnaire. The results showed that college students' aggression generally decreased steadily over 15 years. Compared to 2003, aggression in 2017 decreased by 1.030 standard deviations. The decline in physical aggression, verbal aggression, and hostility among college students were more rapid than anger. College students from the Eastern region of China demonstrated this decline more than those from the Center and Western regions. Both male and female college students showed decreasing aggression, and the decline was larger in males compared to females.

Keywords Chinese college students · Meta-analysis · Magnitude of differences · Aggression

Introduction

Aggression is a behavior that involves deliberately inflicting physical and psychological harm on others (Anderson and Bushman 2002). A survey by Kann et al. (2016) found that 22.6% of high school students in the U.S. had experienced physical confrontation within the prior year. Studies by the Centers for Disease Control and Prevention (CDC 2014) indicated that in 2014 alone, 501,581 adolescents aged

10–24 in the U.S. were treated in an emergency room as a result of physical attacks. Aggression is also common among Chinese college students. Guo et al. (2010) found in a survey that 27.7% of students had moderate or above moderate aggression tendencies, and another study showed that 64.6% of students in China had experienced school violence (Jiang et al. 2014). For these reasons, researchers in the fields of psychology, sociology, and pedagogy are interested in finding ways to intervene in order to control aggression based on empirical evidence.

According to Buss and Perry (1992), there are three main types of aggression, including instrumental, emotional, and cognitive aggression. Instrumental aggression, also known as the motor component of aggression, refers to harming and endangering others, and mainly includes physical and verbal attacks. Emotional aggression, also known as affective aggression, refers to anger and mainly includes physiological activation and preparation for an attack. Cognitive aggression refers to hostility and involves feelings of malice and injustice. Based on the above categorization, Buss and Perry (1992) further developed the Aggression Questionnaire (AQ), which contains 29 items under these three dimensions with four factors, namely, physical aggression, verbal aggression, anger, and hostility. The questionnaire was introduced in 2003 in China to measure aggression among college students. This study involved a meta-analysis on

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survey reports using the AQ to examine changes in aggressive behavior over time.

According to previous studies, whether aggression among college students in China has risen or declined so far remains a controversial topic. The optimistic perspective argues that aggression among college students has decreased over time due to the following reasons. Firstly, with social progress, individuals increasingly adopt pro-social behavior, which is seen to bring honor to and enhance the status of those who practice it, while aggression has adverse consequences (Hilbe and Sigmund 2010; Perc and Szolnoki 2010). Secondly, the development of the internet has educated the public that the serious consequences of aggression can have a huge impact on individuals' lives, and rational judgment has led people to increase the control over their own aggressive behavior (Pinker 2012). Thirdly, China's economic development has raised young people's level of education, whose overall personality has changed positively over the years, and this has reduced aggression to a certain extent (Li 2014). On the other hand, the pessimistic perspective argues that over the years, the intensity level of college student attacks has increased due to the following reasons. Firstly, the rapid development of the internet has allowed college students to easily access violent media (e.g., violent videos, texts, and games), and exposure to violent media has been shown to positively predict aggression (Cho et al. 2017; Gentile et al. 2017; Greitemeyer 2018). Secondly, most college students in China born in the 1990s and 2000s are the only child in their families. Compared with children with siblings, they are more inclined to adopt coping strategies such as escape, venting, and denial, and less likely to adopt strategies such as problem-solving, seeking social support, or positive rationalization. Therefore, this has led to an increase in aggression among college students during this period (Zhou 2012).

The controversy between the optimistic and pessimistic perspectives has caused confusion over the reality of college students' aggression. There are two reasons for this phenomenon: firstly, most of the supporters of either perspective adopt a process of individual subjective analysis, but lack empirical evidence; secondly, when researchers perform comparative analyses, they often compare and analyze data from different time periods ignoring the time variable. Therefore, we propose adopting a new approach, the cross-temporal meta-analysis, to resolve the above disagreements and referring to college students themselves to reveal the reality of aggressive behavior in this population.

Another issue with the differences between the optimistic and pessimistic perspectives is that previous studies have ignored differences among the type of aggression. In the past, all surveys were cross-sectional and participants either came from the same region(s) or belonged to the same gender. Ignoring these factors or comparing the results with a normal or reference group renders it difficult to reach

accurate conclusions. College students were differences in gender, regional cultures, and other factors. Research has shown that these factors have a significant impact on college students' aggressive behavior (Sun et al. 2013; Xia et al. 2016). A particularly notable point is that, as the younger generations become college students, we find that dramatic changes in the living environment and social background of those born in the 1990s and 2000s have led to significant psychological and behavioral changes compared with their older counterparts. In this context, attention to college students' aggression appears to be even more important. Thus, another focus of this study was on the changes and differences in aggression between aggression sub-types (e.g., region and gender).

The cross-temporal meta-analysis (CTMA) is a technique proposed by American scholar Twenge (2000). Twenge et al. (2004) considered this as a modified meta-analysis method, also known as a within-scale meta-analysis, involving a cross-sectional study "design" specifically for performing a meta-analysis to find differences and variations over long timespan or eras (historical development). This "design" coherently connects isolated studies in chronological order, presenting existing studies as cross-sectional samples of historical development. As a special type of meta-analysis, this method takes a step further by describing the trend of changes in individuals' psychological characteristics at different ages. Its unique feature is that it considers time as a bridge linking social indicators with corresponding psychological factors, exploring the factors of social change behind the birth group effect. The way data is collected is the same as in common meta-analysis, except that the cross-sectional historical study is not to calculate effect size (d), but to observe the study's mean (M). Twenge conducted extensive research using this method and made an important contribution to the research on changes in psychology and behavior in the US over the past 50 years. Chinese scholars have also conducted a series of studies on psychological indicators, such as mental health and self-esteem, in college students in China (Sha and Zhang 2016; Xin and Zhang 2009), revealing the changing trends in the psychology of college students in China since the Chinese economic reform. Thus, compared with traditional meta-analysis, cross-sectional historical studies are not only able to quantitatively analyze existing survey data to reach general conclusions but can also examine changes and patterns in the psychology and behavior of individuals or groups within a historical period. Therefore, we conducted a cross-sectional historical study on published survey findings regarding college students' aggression using the AQ to establish an association between college students' aggression and time period. By examining score changes, we aimed to reveal the changes in college students' aggression and provide a factual basis for follow-up research on college students' aggression in China.

Materials and Methods

Measurements

The AQ, developed by Buss and Perry (1992), has been widely used in the assessment of aggression among Chinese college students (Li et al. 2017). Therefore, this study searched for original studies reporting college students' scores on this scale for this cross-temporal meta-analysis. A total of 29 items (e.g., Some of my friends think I am a hothead) are included in the AQ, it involving physical aggression, verbal aggression, anger, and hostility, with a five-point scale from 1 (extremely uncharacteristic of me) to 5 (extremely characteristic of me), which represent the main aspects of aggression extracted through numerous factor analyses of existing scales (Cronbach's alphas 0.60–0.89, intra-class correlation coefficients 0.57–0.81). The higher the score is, the more frequent the aggressive behavior occurs.

Literature Search

A literature search was conducted in this study. The terms “college students,” “undergraduate,” “aggression,” “bully,” “act of violence,” and “aggressive behavior” were used as keywords to search three of China's largest databases—China National Knowledge Internet, Wanfang, and

Chongqing VIP Information—for studies published between January 2005 and March 2019.

The temporal classification of studies was based on data collection dates provided by the respective authors. For studies where sampling dates were not provided, we followed previous studies (Twenge and Im 2007; Xin et al. 2012) and subtracted 2 years from the year of publication as a proxy for the date of actual data collection.

Study Selection Process and Inclusion Criteria

Inclusion criteria for this study were as follows: (1) studies using the same tool for measurement, i.e., the AQ; (2) participants involved were Chinese college students; (3) studies reporting means, standard deviations, and sample sizes, or studies whose incomplete datasets were supplemented with further information via email correspondence with the authors (if the authors did not respond within 1 month, their data were excluded); (4) if an author used the same dataset in multiple studies, only one study was included; and (5) the articles were published between January 2005 and March 2019. The studies that fulfilled all the above criteria were included in the meta-analysis, while those which did not meet any one of the criterion were excluded.

The specific literature search and selection strategies are presented in a PRISMA flow diagram (Moher et al. 2009; Fig. 1). As shown in the diagram, 3118 articles were identified in the search, and 2166 duplicates were removed

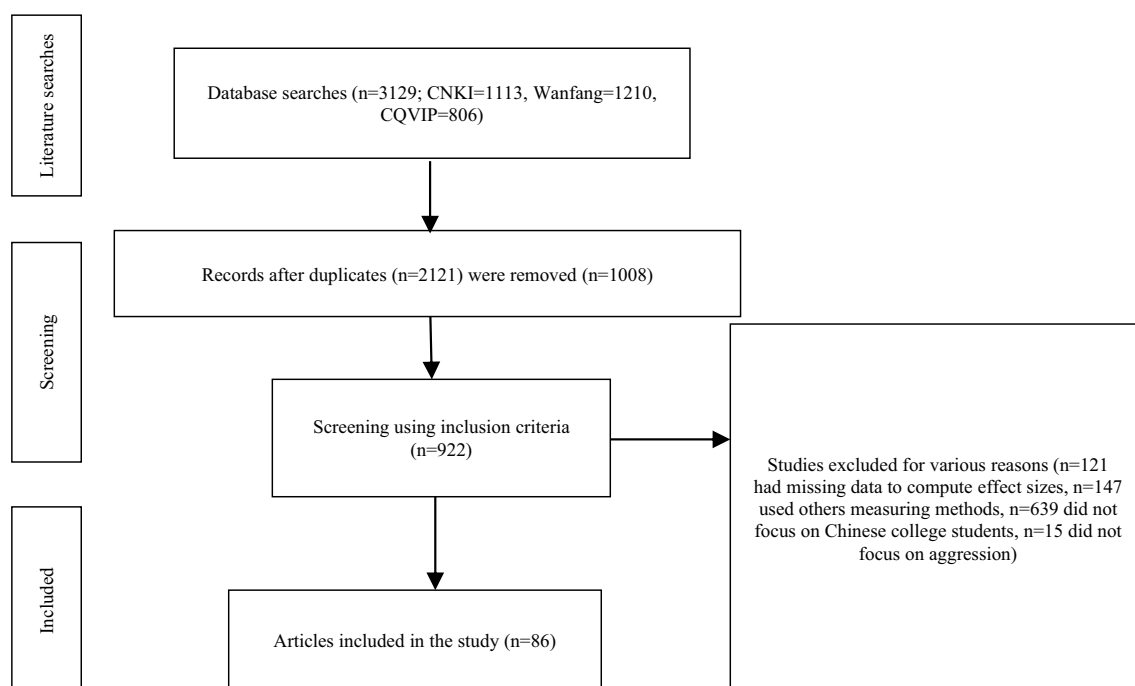


Fig. 1 PRISMA diagram of the search strategies and inclusion process. *CNKI* China National Knowledge Internet, *CQVIP* Chongqing VIP Information

during the initial screening. As per the inclusion criteria, another 866 articles were excluded, leaving 86 studies to be used in our meta-analysis. The distribution of the number of studies and their sample sizes according to the data collection year are shown in Table 1.

Table 1 Distribution of survey samples from 2003 to 2017

Year of collection	Number of studies	Total sample size	No. of studies including gender
2003	1	510	1
2005	2	603	2
2006	3	1372	2
2007	5	802	4
2008	1	398	1
2009	7	14,686	6
2010	5	1189	4
2011	9	6317	9
2012	6	5863	5
2013	9	14,392	6
2014	14	9912	13
2015	9	4772	6
2016	11	7909	9
2017	4	2672	2
Total	86	71,397	70

Variable Coding and Data Processing

The 86 selected studies were coded. In articles where only the research data were provided and lack the complete study results, the following formulae (Eqs. 1, 2) were used to produce weighted statistics from the provided data (M : combined average, s_T : combined standard deviation, n_i : study sample size, m_i : average, and s_i : standard deviation).

$$M = \sum m_i n_i / \sum n_i \quad (1)$$

$$s_T = \sqrt{\left[\sum n_i s_i^2 + \sum n_i (m_i - M)^2 \right] / \sum n_i} \quad (2)$$

Results

Correlation Between Aggression Score and Year

In this study, the trend of college students' aggression over time was determined by plotting a scatter diagram of mean aggression scores against time (Fig. 2). As seen in Fig. 2, college students' aggression levels displayed a downward trend over time.

In order to further reveal the chronological effects on college students' aggression in mainland China, this study used the chronological date of data collection as the independent

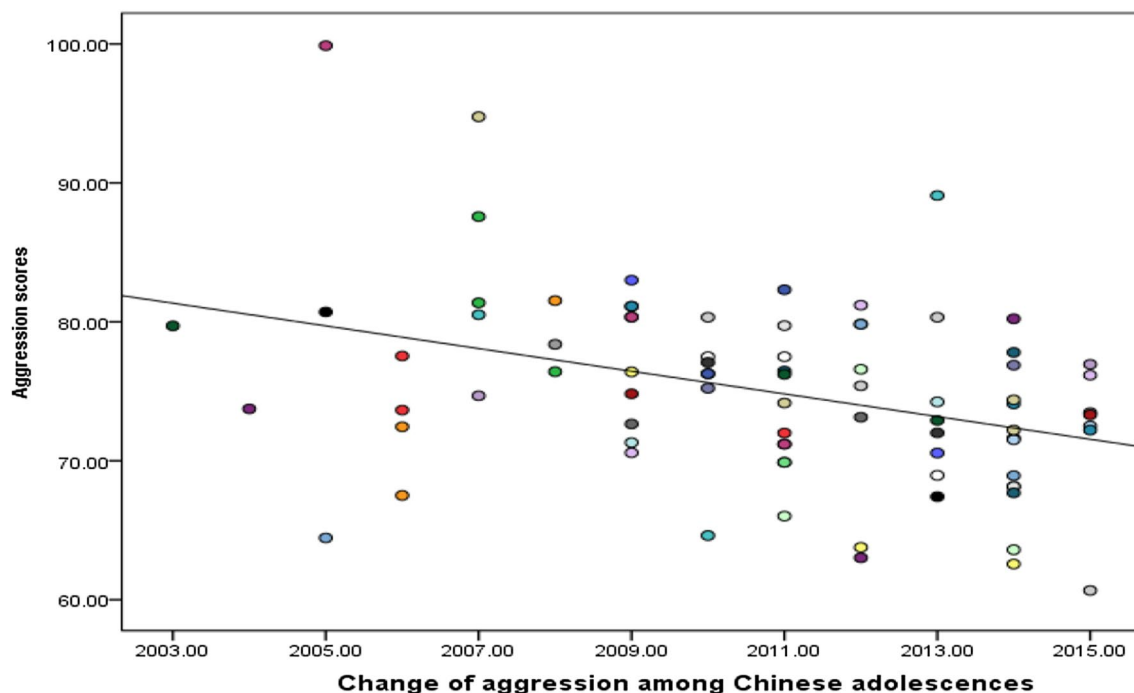


Fig. 2 Differences in aggression level among Chinese college students from 2003 to 2017

variable and the aggression score as the dependent variable to conduct a simple regression analysis. The results indicated that the time period significantly predicted aggression scores in Chinese college students ($\beta = -0.423$, $p < 0.001$, $R^2 = 0.179$). Due to large variations in sample size, we used weighted sample sizes to analyze the relationship between time period and aggression, and the predictive effect of time period on aggression was still significant ($\beta = -0.518$, $P < 0.001$, $R^2 = 0.268$), displaying a downward trend over time.

Magnitude of Change in Aggression

In order to further analyze the magnitude of change in aggression, we established a regression equation with weighted sample sizes and considering time period as an independent variable and mean aggression score as the dependent variable. The results yielded the following regression equation: $y = -1.131x + 2351.121$ (where y is the aggression score, -1.131 is the unnormalized regression coefficient, x is the time period, and 2351.121 is the constant term). Subsequently, we inputted the years 2003 and 2017 into the equation to obtain their respective mean aggression scores, M_{2003} and M_{2017} , and calculated the arithmetic mean of all standard deviations (SD). Finally, the effect size d was calculated (Eq. 3).

$$d = (M_{2017} - M_{2003}) / SD \quad (3)$$

$$r^2 = d^2 / (d^2 + 4) \quad (4)$$

As shown in Table 2, the aggression score of college students in mainland China decreased by 10.296 points from 2003 to 2017, while the standard deviation decreased by 1.030 points, which implies that the effect size was 1.030. Cohen (1992) suggested that an effect size of 0.2–0.5 is small, 0.5–0.8 is medium, and above 0.8 is large. The effect size in this study was above 0.8, indicating significant changes in aggression over time. The explanatory power of time period on college students' aggression was 21.0%

(Eq. 4), illustrating that college students aggression in China significantly declined over the 15-year period.

Differences in College Students' Aggression in Different Dimensions

To examine the magnitude differences in physical aggression, verbal aggression, anger, and hostility; we established regression equation with weighted sample sizes and considering time period as an independent variable and mean scores (mean physical aggression score, mean verbal aggression score, mean anger score, and mean hostility score) as the dependent variable. These results yielded the following regression equations: $y_{\text{physical aggression}} = -0.451x + 926.194$, $y_{\text{verbal aggression}} = -0.273x + 561.727$, $y_{\text{anger}} = -0.106x + 230.489$, $y_{\text{hostility}} = -0.293x + 609.109$ (where y is the mean score; -0.451 , -0.273 , -0.106 , and -0.293 are the unnormalized regression coefficient; x is the time period; 926.194 , 561.727 , 230.489 , and 609.109 are the constant term). Subsequently, we entered the years 2003 and 2017 into the equation to obtain their respective mean scores, M_{2003} and M_{2017} , and calculated the arithmetic mean of all standard deviations (SD). Finally, the effect size d was calculated.

As shown in Table 3, the mean physical aggression score, mean verbal aggression score, mean anger score, and mean hostility score of college students in mainland China decreased by 6.134, 3.822, 1.484, and 4.112 points from 2003 to 2017, while the standard deviation decreased by 2.956, 1.155, 0.297, and .814 points respectively, which implies that the effect size were 2.956, 1.155, 0.297, and 0.814. The effect size in anger was above 0.2 and below 0.5, indicating small differences in anger, while the effect sizes in physical aggression, verbal aggression, and hostility were above 0.8, indicating significant differences in physical aggression, verbal aggression, and hostility (Cohen 1992). The explanatory power of time period on college students' physical aggression, verbal aggression, and hostility were 68.7%, 25.0%, and 14.2% (Eq. 4), illustrating the decline of these factors over a 15-year period.

Table 2 Effect size and explanatory power of time period on college students aggression

	M_{2003}	M_{2017}	M_{change}	SD	d	r^2
Aggression	85.728	64.894	-15.834	15.368	-1.030	0.210

Table 3 Effect size and explanatory power of time period on college students' aggression

	M_{2003}	M_{2017}	M_{change}	SD	d	r^2
Physical aggression	22.841	16.527	-6.314	2.136	-2.956	0.687
Verbal aggression	14.908	11.048	-3.822	3.310	-1.155	0.250
Anger	18.171	16.687	-1.484	4.990	-0.297	0.022
Hostility	22.240	18.128	-4.112	5.040	-0.814	0.142

Changes in College Students' Aggression in Different Regions over Time

To explore the trend of aggression among college students from different regions over time, this study examined college students' aggression in the Eastern, Central, and Western regions of China. There were 25 studies on the Eastern region from 2003 to 2017. There were 39 studies on the Central region from 2005 to 2017. There were 22 articles on the Western region from 2005 to 2017. The results of the weighted regression analysis, shown in Table 3, illustrate that time period predicted college students' aggression in the Eastern region ($\beta = -0.611$, $p < 0.01$, $R^2 = 0.373$), Central region ($\beta = -0.436$, $p < 0.01$, $R^2 = 0.90$), and Western region ($\beta = -0.469$, $p < 0.05$, $R^2 = 0.220$).

Further analysis found that between 2003 and 2017, the aggression score of college students in the Eastern region decreased by 16.261 points and the standard deviation by 1.003, which means that the effect size was 1.003 (greater than 0.8). This indicates that in the 15-year time period there were important changes in college students' aggression. The explanatory power of time period on college students' aggression in the Eastern region was 20.1%.

Between 2005 and 2017, the aggression score of college students in the Central region decreased by 11.268 points and the standard deviation by 0.735; thus, the effect size was 0.735, which is between 0.5 and 0.8. Therefore, in the 13-year time period, there were relatively significant changes in college students' aggression. The explanatory power of time period on college students' aggression in the Central region was 11.9%.

Between 2005 and 2017, the aggression score of college students in the Western region decreased by 10.656 points and the standard deviation by 0.632; thus, the effect size was 0.632, which between 0.5 and 0.8. Thus, there were relatively significant changes in college students' aggression in the 13-year time period in this area. The explanatory

power of time period on college students' aggression in the Western region was 9.1% (Table 4).

Changes in Aggression Among College Students of Different Gender over Time

To investigate whether there were gender differences in aggression over time, this study examined 72 articles that analyzed gender in the period from 2003 to 2017. The results of the weighted regression analysis (Table 5) show that time period significantly predicted aggression in both males ($\beta = -0.302$, $p < 0.05$, $R^2 = 0.091$) and females ($\beta = -0.275$, $p < 0.05$, $R^2 = 0.077$). Further analyses found that between 2003 and 2017, the aggression score of males decreased by 22.569 points and the standard deviation by 1.469; thus, the effect size was 1.469, which is greater than 0.8. This indicates that there were important changes in aggression among males in the 15-year time period. The explanatory power of time period on aggression among males was 26.9%.

Between 2003 and 2017, the aggression score of females decreased by 8.367 and the standard deviation by 0.555; thus, the effect size was 0.555, which is between 0.5 and 0.8. This indicates that there were relatively significant changes in aggression among females in the 15-year time period. The explanatory power of time period on aggression among females was 7.2%.

Discussion

Gradual Decline in College Students' Aggression in China

In this study, we adopted a cross-temporal meta-analysis to analyze 86 articles that used the AQ to investigate college students' aggression in mainland China during the period 2003–2017. The results show a downward trend for college

Table 4 Changes in aggression level among college students in different regions

	β	R^2	M_{change}	SD	d	r^2
Eastern	-0.611**	0.373	-16.261	16.201	-1.003	0.201
Central	-0.436**	0.190	-11.268	15.321	-0.735	0.119
Western	-0.469*	0.220	-10.565	16.698	-0.632	0.091

* $p < 0.05$, ** $p < 0.01$

M_{change} difference between mean aggression scores in first and last year, SD mean of all standard deviations, d effect size; r^2 explanatory power of time period

Table 5 Changes in aggression level in college students of different genders

	β	R^2	M_{change}	SD	d	r^2
Male	-0.302*	0.091	-22.569	15.363	-1.469	0.269
Female	-0.275*	0.077	-8.367	15.066	-0.555	0.072

students' aggression over this 15-year period. We also applied a longitudinal comparison to analyze the changes in aggression over time, revealing the evolution of aggression among college students in China more accurately.

Our results tend to concur with the optimistic perspective, but inconsistent with the view of the general public, which consider college students' aggression a growing problem. From the perspective of evolutionary psychology, individuals exhibit pro-social behavior because it benefits the individual or group, and is conducive to the spread of genes, the improvement of living conditions, and the improvement of individuals or groups (Krebs 2015). On the other hand, the effects of aggression are exactly the opposite. Consequently, as society continues to develop, college students are increasingly adopting pro-social behavior and rejecting aggressive behavior.

Furthermore, the general learning model suggests that the interaction of individual variables with environmental variables activates certain internal states (cognition, emotions, and physiological activation) in the individual, and such activation affects individual behavior (Buckley and Anderson 2006). Therefore, the decrease in college students' aggression should be related to individual college students and their environments.

In regard to individual factors, the number of only child in China in the last 20 years has increased following social advancements. Most of these only children grew up in happy families, experienced less competition, and tend to be gentle in character. For example, Falbo and Polit (1986) found in a meta-analysis that only children were significantly superior to non-only children in personality traits such as control, autonomy, and maturity, and these characteristics had an inhibitory effect on college students' aggression (Li et al. 2017; Luo 2016). Chinese studies also showed that only children have significantly higher life satisfaction and subjective well-being than do non-only children, and are significantly less depressed and anxious than are non-only children (Yuan et al. 2013). This suggests that the level of college students' aggression in China may have decreased because of the predominance of pro-social personalities in only children. This is, of course, only an inference yet to be verified by future studies.

With regard to situational factors, the experiences of college students involve mainly their family and classroom environments. Regarding the family environment, democratic parenting methods would allow for more college students to have a pro-social experience in the family, while conversely, parenting methods such as corporal punishment may cause students to experience aggression (Chen et al. 2011). We are observing an increase of families applying democratic parenting methods to raise their children as the educational level of parents continues to rise; inasmuch as 35.2% of Chinese families are adopting these methods (Liu

et al. 2012). Positive parenting has an inhibitory effect on aggression, whereas negative parenting can lead to aggressive behavior (Casas et al. 2006; Farrington 2009; Joireman et al. 2003). Moreover, a learner-centered approach is increasingly being implemented in classrooms in China, and classroom learning is now more concerned with the progress of college students themselves (compared with their own previous performance) rather than the competition with their peers (Lei 2017). This concept allows students to be increasingly exposed to pro-social experiences in the classroom.

Sub-group Differences in Aggression Changes Among Chinese College Students

Firstly, the meta-analysis of college students' physical aggression, verbal aggression, anger, and hostility between 2003 and 2017, this study found that physical aggression, verbal aggression, anger, and hostility declined in all college students within the time period. Analysis of the magnitude of these declines in college students proved that physical aggression, verbal aggression, and hostility were decreased largely, while anger was decreased less. This means that physical aggression, verbal aggression, and hostility decreased more rapidly as compared to anger. The reasons for this phenomenon may be because physical aggression, verbal aggression, and hostility were more explicit compared to anger, and social norms and legal penalties tend to punish these explicit behaviors (Lei et al. 2012).

Secondly, this study found a decline in the level of college students' aggression across all three regions, Eastern, Central, and Western, and there are no significant regional differences. Analyzing the magnitude of the decline in college students' aggression in different regions, we found that the decline in the Eastern region was considered large, while that in the Central and Western regions was moderate. This means that college students' aggression in the Eastern region decreased more rapidly than in the Central and Western regions. The following are possible reasons for this phenomenon: (1) the Eastern region of China has a higher level of economic development and quality of life compared to the Central and Western regions; thus, the population displays less aggression; (2) individuals in the Eastern region have a stronger understanding of the law; and (3) more resources are available in the Eastern region; thus, aggression due to lack of resources is relatively low.

Finally, this study found an overall decline in aggression among both males and females. Analyzing the magnitude of the decline in aggression among college students of different genders, we found that the decline among males was considered large, while that among females was moderate. In other words, male aggression decreased slightly faster than female aggression did, but the difference was not significant. This suggests that gender is not a factor affecting changes

over time in college students' aggression. The following are possible reasons for this phenomenon. On one hand, the rise of feminist movements has caused stereotyped differences between male and female students to diminish (Trouilloud et al. 2002). On the other hand, gender differences have gradually waned with the development of society, and the situations experienced by college students of different genders in school and society have become more similar.

Conclusion

This cross-temporal meta-analysis clearly reveals the dynamic changes in college students' aggression in mainland China over the past 15 years (Fig. 2). It has a number of strengths in the exploration of this topic of college students' aggression and may provide important insights for subsequent studies. In terms of methodology, this study is the first to examine intergenerational effects on college students' aggression in China, and it helps to resolve the controversy over college students' aggression while a vast majority of studies had only addressed the issue through subjective analysis or had not considered time as a social factor behind the birth group effect. Further, this study argues that as China's economy and society continues to develop, individuals will increasingly adopt pro-social behavior and reduce problematic behaviors. The level of aggression among college students in China should continue to decrease in the future. However, while we observe the decline in pro-social behavior, we are also concerned with the plausible mental stress to the individual if they were to confine to the social norms. Especially for a traditionally collectivistic society like China, research on the mental stress or depression of the college students will further provide insights into this aspect. Nevertheless, being able to control oneself had indicated that society will need fewer resources in terms of social security, and channel them to the much-needed aspects such as psychological wellbeing of the college students.

Although this study has yielded valuable results, there are some limitations. Firstly, in terms of measurement tools, the study focused on the AQ by Buss and Perry (1992), which did not account for online aggression. Therefore, the generalizability of this study will need to be taken with caution that the decline in college students' aggression had not taken online aggression into consideration. Future meta-analyses can use research reports based on other measurement tools, especially those that measure online aggression, to further verify the results of this study. Secondly, in terms of sample composition, this study only focused on studies on college students and excluded samples that included children. To ensure the reliability and generalizability of our findings, future studies can consider investigating whether research reports on children produce the same results as those on

college students. Finally, this study only examined changes in college students' aggression among different regions, age groups, and genders over time. In follow-up studies, it may be necessary to further explore if other factors (e.g., being an only child, family socio-economic status, level of personal cognition) predict changes in college students' aggression, in order to build a more detailed explanation model for aggression.

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Author Contributions HL provided the idea, designed this study and wrote the manuscript, contributed to data collection. CMC was revised the language and revised the questions based on editor and reviews' suggestions. SL contributed to provide the idea, design this study, analysis data and write the manuscript. ML was contributed the analysis data.

Compliance with Ethical Standards

Conflict of interest All the authors of this article have no conflict of interest

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of East China Normal University and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors. Informed consent was obtained from all individual participants included in the study.

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