

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Correlations of impulsivity and aggressive behaviors among adolescents in Shanghai, China using bioecological model: cross-sectional data from Global Early Adolescent Study
AUTHORS	Yu, Chunyan; Zhang, Jiashuai; Zuo, Xiayun; Lian, Qiguo; Tu, Xiaowen; Lou, Chaohua

VERSION 1 – REVIEW

REVIEWER	Wasserman, Alexander The University of Texas Health Science Center at San Antonio, Psychiatry
REVIEW RETURNED	10-Nov-2020

GENERAL COMMENTS	<p>Review of Manuscript Number: bmjopen-2020-043785</p> <p>Summary: The present study aimed to examine the relationship between impulsivity and aggressive behavior among school-aged children in China. Though the nature of the study sample is unique, there are a few substantive issues that would improve the quality of the manuscript.</p> <p>Overall Reviews:</p> <ol style="list-style-type: none">1. While there is literature cited regarding the consequences of aggressive behavior during adolescence, a clear developmental framework for the causes and implications of aggressive behavior is lacking. That is, what is it about adolescence that makes it a particularly crucial life state to understand the etiology of aggressive behavior? The authors discuss the General Aggressive Model (GAM), though these processes could occur at any life stage and are unlikely specific to adolescence. Thus, a stronger theoretical framework through a developmental lens is needed to guide the literature summarized in the introduction.2. A strength of the manuscript is the unique sample of school-aged children who reside in Shanghai, China. However, a discussion of cultural factors for why the relationship between impulsivity and aggression might vary in this cultural setting is currently absent. In other works, what contextual factors in China might alter the relationship between impulsivity and aggression, or is there reason to believe that the consequences of aggressive acts might somehow be different compared to school-aged children of European descent?3. One hundred and fourteen participants seems like a high proportion of the sample to have an invalid record for the dependent variable. Can the authors elaborate as to why these data were invalid? Also why were those over the age 15 excluded if they had available data?4. Why was a median split used for the impulsivity scores instead of summary scores? Median splits are problematic in that they ignore important variation in continuous scores and often force individuals into arbitrary high versus low groupings (i.e., there may be no such
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	<p>thing as a high- or low-impulsivity group or the groups may be more nuanced). For a more thorough discussion of problems when conducting median splits, I refer the authors to the paper below: Maxwell, Scott E., and Harold D. Delaney (1993), "Bivariate Median Splits and Spurious Statistical Significance," <i>Psychological Bulletin</i>, 113 (1), 181–90.</p>
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REVIEWER	Maneiro, Lorena Universidade de Santiago de Compostela, Clinical Psychology and Psychobiology
REVIEW RETURNED	12-Dec-2020

GENERAL COMMENTS	<p>This study aims at analyzing the relationship between impulsivity and aggression, as well as other factors that may contribute to explain that relationship.</p> <p>Abstract</p> <p>The description of the design is a bit confusing. On the one hand, there is not information about the study design but the measures that were used and, on the other hand, both impulsivity and aggression were assessed by means of self-reports but, literally, is stated that "a Computer-Assisted Self-Interview was used to access the correlation of aggressive behavior and impulsivity". What does that mean? Was the information about impulsivity and aggression collected by means of online questionnaires? Which kind of study design was used? Were the correlations analyzed in addition to chi-square test and binary logistic regression?</p> <p>Information about the sample must be described in Participants not in Results. Specifically, the statement "Totally 1451 students aged 11 to 15 were included in this study (52.01% of boys)" must be detailed in the Participants section rather than in the Results section.</p> <p>Introduction</p> <p>The introduction is clear and concise but provide a narrow background of both impulsivity and aggression. Impulsivity was traditionally considered as one of the main precursors of a set of antisocial behaviors and, indeed, is the main pillar in Gottfredson and Hirschi's general theory of crime. Since then, numerous studies have been carried out and which supported a strong relationship between impulsivity and aggression, both concurrently and longitudinally. Furthermore, different multi-faceted conceptualizations of impulsivity were proposed that go beyond the consideration of impulsivity as a single construct (see for example the impulsivity model proposed by Whiteside and Lynam, 2001). Taken this under consideration, what are the contributions of this study and what does it add to the vast literature in this field? What are the similarities and differences with other studies conducted in China in this field?</p> <p>As it was explained in the introduction, "the definition of impulsivity could easily lead us to the intuitive relationship between impulsivity and impulsive aggression. However, researches have shown that impulsivity is present in any type of aggressive act and does not make a distinction between acts of premeditated or impulsive aggression". These statements have some implications that must be considered and mentioned in the introduction. Firstly, a strong association between impulsivity and aggression would be expected given the high overlap between the constructs. How was this issue addressed in previous studies? How this distinctiveness contributes to the existing literature? Secondly, impulsive and premeditated aggression may resemble to some extent other conceptualizations based on the function or underlying motivation of aggression, such as reactive and proactive aggression. In this regard, it would be</p>
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	<p>valuable to add some information about the inconsistencies that were previously found in the literature.</p> <p>Overall, I consider that the theoretical background could be argued more strongly. Also, discussing about the inconsistencies found in previous studies and highlight the relevance of the conceptualization models selected is strongly advised.</p> <p>Methods</p> <p>Study design and participants</p> <p>Which sampling procedure was used for the selection of the schools?</p> <p>Considering that the sample of current study is part of a broad longitudinal study, why the authors have not longitudinally analyzed the relationship between impulsivity and aggression? This would add value to the study.</p> <p>I suggest removing Figure 1 since the information provided is already described in the main text.</p> <p>The background characteristics of participants should be described in the participants section rather than as part of the results.</p> <p>Procedure</p> <p>The procedure section must be completed with some specific information. Given this study is part of a longitudinal study, how was personal data managed? Which kind of psychology courses take these students? On the other hand, how many research assistants were involved in this project? The data was collected between November and December in individual sessions of 30-60 minutes and the sample was composed by almost 1600 participants, how researchers dealt with that?</p> <p>Measures</p> <p>Regarding information about aggression, why a self-reported scale to assess aggression was not used? Evaluating aggression by means of only two items may affect the validity of the results. Furthermore, information included in the introduction focused on impulsive and premeditated aggression but any measure to assess these functions of aggression was used. I suggest to adapt the theoretical background to the goals of study.</p> <p>The internal consistency of the attentional impulsivity and motor impulsivity are quite low. How this could affect the results? Have the authors considered to use another index for internal consistency instead of Cronbach's alpha, such as omega that is usually a more robust indicator? Was the impulsivity variable normally distributed? This should have been considered when dichotomizing the variables.</p> <p>Could the authors provide more detailed information about all the demographic and environmental variables that were included in the analyses? A list of factors is presented in the measures section followed by "etc." and followed by "et al." in the data analyses section.</p> <p>Data analyses</p> <p>Could the authors provide a rationale about analyzing both chi-square and t-test? What does the dichotomized variable of impulsivity add to the analyses and the results?</p> <p>According to the information provided in the data analysis section, a binary logistic regression in which all the variables were introduced in the same step of the model. However, a set of covariates from different domains was considered in the analysis, therefore, a hierarchical logistic regression might be most appropriate for this analysis.</p> <p>Given the gender differences that were previously found regarding impulsivity and aggression, it would be interesting to include these analyses as part of the study.</p>
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	<p>Results Following the APA guidelines, it is not necessary to repeat in the main text the results that are displayed in the tables. Please, review the APA style for results presentation.</p> <p>There are some results that are displayed in Table 3 that were not explained in the main text, specifically those related to the control variables. Also, the description of the results according to the presentation in Table 3 and Table 4 are quite disorganized. I suggest explaining in the first place the results of the Table 3 and subsequently the results included in Table 4.</p> <p>Discussion The results as regards the differences in the control variables are discussed based on previous findings and theories, however, no mention and no hypotheses were proposed in the introduction in this regard.</p> <p>What are the implications of this study and how this study would contribute to this field?</p> <p>Overall, the discussion must be strengthened in order to provide a current view of this topic and highlight the contributions of this study.</p>
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REVIEWER	Turkoglu, Serhat Selçuk University Faculty of Medicine
REVIEW RETURNED	16-Dec-2020

GENERAL COMMENTS	çalışmanın sonuçları bize ne kadar önemli veriler verse de sadece çocuklara ölçek doldurarak yapılan bir çalışma yöntemsel açıdan çok sorunludur. bunu destekleyen klinik görüşme ve aile görüşmesi yapılmalıdır. Elde edilen verilerin güvenilirliği açısından ciddi düzeyde sorunlu bir durumdur.
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Dr. Alexander Wasserman, The University of Texas Health Science Center at San Antonio

Comments to the Author:

Review of Manuscript Number: bmjopen-2020-043785

Summary: The present study aimed to examine the relationship between impulsivity and aggressive behavior among school-aged children in China. Though the nature of the study sample is unique, there are a few substantive issues that would improve the quality of the manuscript.

Overall Reviews:

1. While there is literature cited regarding the consequences of aggressive behavior during adolescence, a clear developmental framework for the causes and implications of aggressive behavior is lacking. That is, what is it about adolescence that makes it a particularly crucial life state to understand the etiology of aggressive behavior? The authors discuss the General Aggressive Model (GAM), though these processes could occur at any life stage and are unlikely specific to adolescence. Thus, a stronger

theoretical framework through a developmental lens is needed to guide the literature summarized in the introduction.

Response: Thank you for the comments. Indeed, GAM model could be applied to any life stage and is not specific to adolescence. For the present paper using cross-sectional data, we considered your suggestion and changed the framework to “the ecological model and Blum’s conceptual framework for research targeting early adolescence”, which is more congruent with our covariates selecting assumption. We also cited the Dual System Model to stress the importance of employing developmental lens on studies regarding adolescents behavioral changes and added that “Adolescence is a dynamic developmental period of learning and adaptation, which crates both vulnerabilities and unique opportunities for early intervention and prevention.” to support our rationale to explore the factors of aggressive behaviors specifically among young adolescents. Please find line 14-27 of page 5 to read a more detailed revision regarding the framework.

2. A strength of the manuscript in the unique sample of school-aged children who reside in Shanghai, China. However, a discussion of cultural factors for why the relationship between impulsivity and aggression might vary in this cultural setting is currently absent. In other works, what contextual factors in China might alter the relationship between impulsivity and aggression, or is there reason to believe that the consequences of aggressive acts might somehow be different compared to school-aged children of European decent?

Response: Thank you for your suggestion. We elaborated on the aspect of cultural influences in the revised introduction. We then added a paragraph discussing the possible cultural effects on aggressive behavior to echo the description in the introduction:

“There are also culturally bounded limits on acceptable levels of aggression or violent behaviors. Aggressive behaviors over the boundaries of acceptable levels are often considered harmful. Such cultural differences were noted by researchers both in the level of aggression and their correlates, reflected through the social environment and individual differences, including personality and cognition”. (line 28-32, page 5)

“The prevalence of aggressive behavior in our sample is significantly lower than that among either Asian Americans or any other racial/ethnic group (White, Black, Hispanic) in the U.S., according to the result from the Youth Risk Behavior Surveillance System. Suggesting that cultural factors might work as the modifiers between impulsivity and aggression[41]. A study among Chinese and Canadian adolescents suggested that in Eastern cultures, individuals tend to define themselves in the context of social relationships and group membership. Thus the expression of self-focused emotions is discouraged, and peacefulness is highly valued[42]. However, such a trend might

decrease as the age increases or the living environment changes, indicating the necessity to employ a developmental view of behavioral changes when considering the cultural influences.”(line 17-25, page 17)

3. One hundred and fourteen participants seems like a high proportion of the sample to have an invalid record for the dependent variable. Can the authors elaborate as to why these data were invalid? Also why were those over the age 15 excluded if they had available data?

Response: As you noticed, we previously used the longitudinal dataset for data analysis and excluded those who do not meet the criterion of age 10-14 at the baseline. Because we measured the BIS scale only in the second-wave data collection, in the revision, instead of using the linked dataset to explore the correlation between impulsivity and aggression, we discussed among the co-authors and decided to keep those who were over the age of 15 if they had available data.

In the revised manuscript, 87 (5.4%) out of 1611 enrolled students were excluded because of missing information on impulsivity (16) and aggressive behaviors (71). The data were considered as invalid/missing when the participants chose “don’t know” or “refuse to answer” options on the outcome and main predictor.

4. Why was a median split used for the impulsivity scores instead of summary scores? Median splits are problematic in that they ignore important variation in continuous scores and often force individuals into arbitrary high versus low groupings (i.e., there may be no such thing as a high- or low-impulsivity group or the groups may be more nuanced). For a more thorough discussion of problems when conducting median splits, I refer the authors to the paper below:

Maxwell, Scott E., and Harold D. Delaney (1993), “Bivariate Median Splits and Spurious Statistical Significance,” *Psychological Bulletin*, 113 (1), 181–90.

Response: We calculated the mean scores ranged from 1 to 4 for the BIS-11 and subscales. Due to the skewed distributions of mean scores and the absence of generalized cut-off values for the subscales among healthy adolescents, we dichotomized the median's continuous mean scores, which seems a popular method across researches to deal with such variables.

Inspired by your suggestions, in the revision, we split the continuous mean scores into tertiles in the multivariate regression model, comparing the highest and the median tertile to the lowest tertile.

Reviewer: 2

Dr. Lorena Maneiro, Universidade de Santiago de Compostela

Comments to the Author:

This study aims at analyzing the relationship between impulsivity and aggression, as well as other factors that may contribute to explain that relationship.

Abstract

The description of the design is a bit confusing. On the one hand, there is not information about the study design but the measures that were used and, on the other hand, both impulsivity and aggression were assessed by means of self-reports but, literally, is stated that “a Computer-Assisted Self-Interview was used to assess the correlation of aggressive behavior and impulsivity”. What does that mean? Was the information about impulsivity and aggression collected by means of online questionnaires? Which kind of study design was used? Were the correlations analyzed in addition to chi-square test and binary logistic regression?

Information about the sample must be described in Participants not in Results. Specifically, the statement “Totally 1451 students aged 11 to 15 were included in this study (52.01% of boys)” must be detailed in the Participants section rather than in the Results section.

Response: Thanks for your careful reading and detailed suggestions. The GEAS study in Shanghai site is a school-based longitudinal study, while we used the cross-sectional data collected in the second wave to explore our study aim. The data collection was in-person. Interviewers brought tablets with them to the school, with the loaded Computer-Assisted Self-Interview(CASI) questionnaires in the tablets. We used CASI among adolescents because it is believed to improve quality data collection, minimize data entry errors and reduce time to clean and monitor incoming data through technological approaches. We modified the confusing description, added research design and other information, and corrected the abstract format based on your suggestions and the Author Guideline of BMJ Open.

Introduction

The introduction is clear and concise but provide a narrow background of both impulsivity and aggression. Impulsivity was traditionally considered as one of the main precursors of a set of antisocial behaviors and, indeed, is the main pillar in Gottfredson and Hirschi’s general theory of crime. Since then, numerous studies have been carried out and which supported a strong relationship between impulsivity and aggression, both concurrently and longitudinally. Furthermore, different multi-faceted conceptualizations of impulsivity were proposed that go beyond the consideration of impulsivity as a single construct (see for example the impulsivity model proposed by). Taken this under consideration, what are the contributions of this study and what does it add to the vast literature in this field? What are the similarities and differences with other studies conducted in China in this field?

As it was explained in the introduction, “the definition of impulsivity could easily lead us to the intuitive relationship between impulsivity and impulsive aggression. However, researches have shown that impulsivity is present in any type of aggressive act and does not make a distinction between acts of premeditated or impulsive aggression”. These statements have some implications that must be considered and mentioned in the introduction. Firstly, a strong association between impulsivity and aggression would be expected given the high overlap between the constructs. How was this issue

addressed in previous studies? How this distinctiveness contributes to the existing literature? Secondly, impulsive and premeditated aggression may resemble to some extent other conceptualizations based on the function or underlying motivation of aggression, such as reactive and proactive aggression. In this regard, it would be valuable to add some information about the inconsistencies that were previously found in the literature.

Overall, I consider that the theoretical background could be argued more strongly. Also, discussing about the inconsistencies found in previous studies and highlight the relevance of the conceptualization models selected is strongly advised.

Response: Thank you very much for your insightful comments.

(1) *what are the contributions of this study and what does it add to the vast literature in this field? What are the similarities and differences with other studies conducted in China in this field?*

We added related information in the discussion part to address the similarities and differences with other studies:

“Studies in ordinary western people indicated that the non-planning sub-trait of impulsivity was related to impulsive aggression[37]. In our sample, however, the correlation of non-planning impulsivity and aggression is not clearly supported. In the multivariate model of our study, a higher level of motor impulsivity was the only sub-trait that significantly contributed to aggressive behaviors among both boys and girls, suggesting that the aggressive behaviors among Chinese youth are conducted in adolescence majorly because of the act without thinking..” (line 15-21, page 15)

And then concluded the contribution as follows:“...this study contributes to the growing body of research that tries to delve into the relation between three sub-traits of impulsivity and aggressive behaviors through a sample of Chinese middles school adolescent students. Consistent with research in other populations, a positive association between impulsivity and aggressive behaviors were found.” (line 22-25, page 18)

(2) *How was this issue(a strong association between impulsivity and aggression) addressed in previous studies? How this distinctiveness contributes to the existing literature?*

The strong association between impulsivity and aggression is stress in the revised manuscript as the reviewer suggested: “A great number of studies in western countries have demonstrated a positive association between impulsivity and aggression[7, 17-19], both concurrently and longitudinally” (line 29-30, page 4).

However, such correlations were majorly explored among the forensic population or clinical sample, or taking the impulsivity as a whole (using the total impulsive score in the analysis)) instead of considering it as a multi-facet construct.(line 31-33, page 4)

After that we also looked into literatures exploring their relationship among adolescents (see line 1-3, page 5), as well as existing research exploring the association between sub-traits of impulsivity and aggression (line 3-8, page 5). We then concluded that: “Given the mixed results and their relevance to both healthy and harmful facets of the behaviors, the role of impulsivity still

attracts numerous attentions. The question of whether a person is capable of modulating their cognition and behavior to fit the demands of a given environment is imperative[14], which makes understanding the role of impulsiveness in the forming of aggression among healthy/ordinary population, especially among young adolescents who are at the critical developing stage urgent.”(line 8-13, page 5)

(3) *the theoretical background could be argued more strongly*

Followed your suggestions, we reshaped the introduction part and first talked about aggression and its consequences to adolescents, and then we focused on the correlation of impulsivity and aggressive behaviors. After that, we include the ecological model to guide the introduction of several covariates. At last, we talked a little bit about potential cultural influences to support the rationale of doing the present among Chinese adolescents specifically.

(4) *discussing about the inconsistencies found in previous studies*

We added this in the discussion part as you suggested:

“Studies among forensic and clinical samples found high impulsiveness in both types of aggression, with no significant difference in total scores measured by BIS[1 22]. Studies in ordinary western people indicated that the non-planning sub-trait of impulsivity was related to impulsive aggression[37]. In our sample, however, the correlation of non-planning impulsivity and aggression is not clearly supported. In the multivariate model of our study, a higher level of motor impulsivity was the only sub-trait that significantly contributed to aggressive behaviors among both boys and girls, suggesting that the aggressive behaviors among Chinese youth are conducted in adolescence majorly because of the act without thinking.” (line 14-21, page 15)

Methods

Study design and participants

Which sampling procedure was used for the selection of the schools?

Considering that the sample of current study is part of a broad longitudinal study, why the authors have not longitudinally analyzed the relationship between impulsivity and aggression? This would add value to the study.

I suggest removing Figure 1 since the information provided is already described in the main text.

The background characteristics of participants should be described in the participants section rather than as part of the results.

Response: Thank you for the detailed review and suggestions.

(1) *Which sampling procedure was used for the selection of the schools?*

For the Global Early Adolescent Study (GEAS), the stratified cluster sampling procedure was adopted to select participants in Shanghai site. GEAS focused on early adolescents in disadvantaged urban environments, and thus we selected three primary public middle schools located in two less-developed sub-districts in Shanghai. Site coordination and data

collection were implemented with the help of key informants from the local teacher's organization. We added these descriptions to the revised manuscript.

(2) Why the authors have not longitudinally analyzed the relationship between impulsivity and aggression?

Although the current study is part of a broad longitudinal study, impulsivity was only measured in the wave 2 survey in Shanghai, and the wave 3 survey was unfinished until the manuscript formed. Therefore, we only used the cross-sectional data from the second wave to explore the correlations between impulsivity and aggression.

(3) I suggest removing Figure 1 since the information provided is already described in the main text.

Figure 1 was removed from the revised manuscript as you suggested.

(4) The background characteristics of participants should be described in the participants section rather than as part of the results.

We checked the latest published paper and Author Guideline of BMJ Open. The description of the background characteristics of participants as part of the results should be appropriate.

Procedure

The procedure section must be completed with some specific information. Given this study is part of a longitudinal study, how was personal data managed? Which kind of psychology courses take these students? On the other hand, how many research assistants were involved in this project? The data was collected between November and December in individual sessions of 30-60 minutes and the sample was composed by almost 1600 participants, how researchers dealt with that?

Response:

(1) Given this study is part of a longitudinal study, how was personal data managed?

At the preparation stage of the GEAS baseline survey in Shanghai, we generated the unique ID number for each student based on the list provided by our coordinators in the schools. The baseline data then could be matched with the follow-up data by ID number. Before each survey starts, every student would get a sheet containing their name and ID number. Then they were asked to enter the ID number into the electronic questionnaire twice to ensure accuracy, and they needn't input their names. Because this study only used the wave 2 data, we did not describe the above process in the manuscript.

(2) Which kind of psychology courses take these students?

The psychology course is a regular course included in selected schools' routine teaching schedule, usually twice a week, 45 minutes for each class. To avoid misunderstandings, we changed it into "the psychological class".

(3) How many research assistants were involved in this project? How researchers dealt with the data collection?

Although the data collection process lasted more than one month, the actual work was conducted only in a few days for each school. We discussed the appropriate timing and

arrangement of the survey with the schools and coordinators back and forth during that period. Then the teachers organized the students to fill in the electronic questionnaire in their classroom at the settled time. We have 1 to 2 investigators in each classroom (about 25 students) and a total of 8 well-trained investigators to monitor the survey in case the participants needed assistance on technical issues or the understanding of the content in the survey.

Measures

Regarding information about aggression, why a self-reported scale to assess aggression was not used? Evaluating aggression by means of only two items may affect the validity of the results. Furthermore, information included in the introduction focused on impulsive and premeditated aggression but any measure to assess these functions of aggression was used. I suggest to adapt the theoretical background to the goals of study.

Response:

The assessment of aggression is a limitation in this study since aggression is not a primary target of the GEAS. Because our questionnaire contains many variables, we have to adopt shortened items for secondary indicators to reduce participants' burden to improve the data quality. Nonetheless, we still found a significant correlation between impulsivity and aggressiveness. In the future, we hope to conduct further research based on this study to carry out a more comprehensive assessment of aggression.

Following your suggestion, in the background, we raised that: "Though the division (of impulsive and premeditated aggression) is not without meaningfulness to guide the prevention and intervention due to the potential harm it could cause, there were some criticism of the dichotomous method of characterizing aggressive behavior as the distinction of the two is not that clear and it is the harm that should be concerned regardless the typology of the actions" (line 6-9, page 4) as a basis for not making the distinction of two in the present study.

The internal consistency of the attentional impulsivity and motor impulsivity are quite low. How this could affect the results? Have the authors considered to use another index for internal consistency instead of Cronbach's alpha, such as omega that is usually a more robust indicator? Was the impulsivity variable normally distributed? This should have been considered when dichotomizing the variables.

Response:

Inspired by your suggestions, we calculated the omega for BIS-11 and its subscales. However, the values of this coefficient are not significantly improved compared to the Cronbach's alpha. And then, some colleagues from the GEAS suggested that the polychoric ordinal alpha seems an appropriate coefficient when dealing with such a scale rated by Likert-type options. The value of this coefficient in the present study was 0.62 for attentional impulsivity, 0.81 for non-planning impulsivity, 0.74 for motor impulsivity, and 0.89 for the BIS-11. Besides, we checked the

published literature that adopted BIS-11 among Chinese adolescents. Surprisingly, most of these studies indicated a low internal consistency of the attention impulsivity scale (Cronbach's alpha < 0.7). According to Perry R. Hinton's explanation in his book "SPSS explained", the alpha ranged 0.7 to 0.9 shows high reliability and 0.5 to 0.7 shows moderate reliability. Generally speaking, we considered the attentional impulsivity scale is credible in this study, even if not perfect.

We calculated the mean scores ranged from 1 to 4 for the BIS-11 and subscales. And yes, the distributions of several sub-traits' mean scores are skewed. We split the continuous mean scores into tertiles in the multivariate regression model in the revised manuscript, comparing the highest and the median tertile to the lowest tertile. Reviewer 1 (Dr. Alexander Wasserman) raised a similar comment regarding variable dichotomizing. Please refer to our response to point 4 on page 4 for more information.

Could the authors provide more detailed information about all the demographic and environmental variables that were included in the analyses? A list of factors is presented in the measures section followed by "etc." and followed by "et al." in the data analyses section.

Response: In the revised manuscript, we added the information about all the demographic and environmental variables in this study in the Methods (2.3.3 covariates, page 7) and Results Part (Table 1, page 8).

Data analyses

Could the authors provide a rationale about analyzing both chi-square and t-test? What does the dichotomized variable of impulsivity add to the analyses and the results?

Response: The chi-square test was not used in the revised manuscript. The t-test and Wilcoxon test were adopted to test the differences in impulsivity score between aggressors and non-aggressors.

According to the information provided in the data analysis section, a binary logistic regression in which all the variables were introduced in the same step of the model. However, a set of covariates from different domains was considered in the analysis, therefore, a hierarchical logistic regression might be most appropriate for this analysis.

Response: Following your suggestion, before modeling, we examined the cluster effects on the level of school (level-3) and class (level-2) through multilevel zero-models to determine the hierarchical structure in our data given the sample was obtained by cluster sampling. We found, however, the effects were statistically insignificant both for boys or girls. Thus the general logistic regression model was chosen for data analysis.

Given the gender differences that were previously found regarding impulsivity and aggression, it would be interesting to include these analyses as part of the study.

Response: We explored the correlations between impulsivity and aggressive behaviors by gender in the revised manuscript, as you suggested.

Results

Following the APA guidelines, it is not necessary to repeat in the main text the results that are displayed in the tables. Please, review the APA style for results presentation.

Response: Thank you for the reminding. We carefully modified the description of the results based on APA guidelines and the latest published papers in BMJ Open.

There are some results that are displayed in Table 3 that were not explained in the main text, specifically those related to the control variables. Also, the description of the results according to the presentation in Table 3 and Table 4 are quite disorganized. I suggest explaining in the first place the results of the Table 3 and subsequently the results included in Table 4.

Response: We removed the original Table 3 from the revised manuscript. Tables 3-5 in the revised manuscript refer to results of the multivariate regression model among the total sample as well as among boys and girls respectively. We described the correlations between impulsivity and aggressive behaviors in the main text, followed by the correlation between covariates and dependent variables.

Discussion

The results as regards the differences in the control variables are discussed based on previous findings and theories, however, no mention and no hypotheses were proposed in the introduction in this regard.

Response: We reframed the theoretical framework and added the description and hypothesis regarding the control variables in the introduction as follows:

“The present study is guided by Bronfenbrenner’s ecological model and Blum’s conceptual framework for research targeting early adolescence[24], including family-, school- and neighborhood- factors in the process of shaping youth’s aggressive behavior despite individual biological characteristics and personal traits[25]. At the family level, family structure and parental connectedness would help buffer the anger, while school and peer interactions exert significant influences on the conducting of aggressive havior[25, 26]. Neighborhood environment is another important but always neglected factor for shaping aggressive behavior as it provides the scenario for multiple health risk behaviors[27].”(line 14-21, page 5)

“For the present study, we hypothesized that (1) impulsivity would be positively correlated with young adolescents’ aggressive behavior while the correlation would be strong among motor or non-planning impulsiveness and aggression; (2)Ecological factors like family interactions, peer interactions and community environment would be influential to the forming of adolescents’ aggressive behaviors” (line 6-9, page 6)

What are the implications of this study and how this study would contribute to this field?

Overall, the discussion must be strengthened in order to provide a current view of this topic and highlight the contributions of this study.

Response: Thank you for the insightful comments. We rewrote the contribution part as follows:

“this study contributes to the growing body of research that tries to delve into the relation between three sub-traits of impulsivity and aggressive behaviors through a sample of Chinese middle school adolescent students. Consistent with research in other populations, a positive association between impulsivity and aggressive behaviors were found. Specifically, such correlation was more salient between motor impulsiveness sub-trait and aggressive behavior among boys and girls. Furthermore, results also indicated that aggressive behaviors were affected by several factors within the ecological model. Comprehensive intervention strategies such as controlling the aggressor's impulsivity, teaching them to channel their anger, creating a supportive and nurturing school and neighborhood environment as well as providing psychological support and services for violence victims are needed.” (line 22-29, page 18)

Reviewer: 3 (Note that the reviewer has chose to provide their review in their own native language)

Dr. Serhat Turkoglu, Selçuk University Faculty of Medicine

Comments to the Author:

çalışmanın sonuçları bize ne kadar önemli veriler verse

de sadece çocuklara ölçek doldurarak yapılan bir çalışma yöntemsel açıdan çok sorunludur. bunu destekleyen klinik görüşme ve aile görüşmesi yapılmalıdır. Elde edilen verilerin güvenilirliği açısından ciddi düzeyde sorunlu bir durumdur.

[NOTE FROM EDITOR: I ran the reviewer's comments through Google Translate but cannot vouch for the accuracy of this translation: "Although the results of the study give us important data, a study conducted by only filling in scales for children is methodically very problematic. clinical interview and family interview should be done to support this. It is a serious problem in terms of the reliability of the data obtained".]

Response: Thanks for your comments.

The BIS-11 is the most commonly used self-report instrument specifically designed for the assessment of impulsiveness in both research and clinical settings. Numerous studies across the world have demonstrated the higher validity and reliability of this scale among various populations, including children and young adolescents. During the formative stage of this study, we translated the scale into Chinese and modified several items based on the expert's advice since they may not be appropriate for very young adolescents, and the results of our pilot study indicated the primary middle school students had a well understanding of the items.

If the participants were children of low or no literacy, the reliability of the data obtained through family interviews may be higher due to the children's limited understanding on the items. However, in that case, the parents or caregivers may spend a lot of time observing their actions and behaviors. For the adolescents including in our study, we considered the data obtained by self-reports should be reliable given they were able to fully understand the items in the questionnaire. Besides, in Shanghai, adolescents spend most of their time in school, and the parents may lack sufficient understanding of their school lives. Observational bias could be generated largely because of insufficient understanding due to caregivers busy work as well as the generational gap in that case.

VERSION 2 – REVIEW

REVIEWER	Wasserman, Alexander The University of Texas Health Science Center at San Antonio, Psychiatry
REVIEW RETURNED	02-Mar-2021

GENERAL COMMENTS	<p>Summary: The authors were responsive to my comments and the revisions have improved the quality of the manuscript. After a careful read, I have a few remaining suggested revisions:</p> <ol style="list-style-type: none"> 1. In the introduction, the authors cite Bronfenbrenner's bioecological model as a framework relevant to the present investigation. However, it remains unclear, at least in the context of the introduction, how the theory is applied to the present investigation. I would urge the authors to be more careful in their description. For example, they state that parents can buffer their child's propensity towards anger or that healthy peer relationships can also reduce aggressive acts. Neither of these possibilities were addressed in the present study (though I acknowledge that any single study does not need to exhaustively test a theoretical model). As such, I would recommend that the authors are more selective in their description of the theory as it pertains to the present study. 2. When describing the BIS the measure, I was unsure what "partly items were scored transpose" meant. Can the authors please elaborate? Perhaps this was meant to describe reverse-coded items? 3. Throughout the manuscript, it would be more useful to describe summary averages for the BIS rather than averages based on the Likert-scale responses. Reporting summary scores is more consistent with previous research and more readily interpretable. 4. When transforming a continuous variable to a categorical variable without meaning cut-offs (such as the tertile split for the BIS), I think the authors need to acknowledge that a limitation of this approach is that they are assuming an underlying qualitative difference between the groups, which may not exist or replicate between other studies. <ol style="list-style-type: none"> a. Relatedly, unless I missed it, it would be helpful to describe the mean BIS scores for each tertile and gender distribution b. The authors are citing skewness in the BIS scores as justification for using tertile cutoffs. As such, please report the skewness of the raw scores in the measures section. 5. Please proofread, there are grammatical errors and typos throughout the manuscript. For example, in Table 3 and in the text the ~ symbol is used and I'm not sure if the authors meant to use a
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	dash instead
REVIEWER	Maneiro, Lorena Universidade de Santiago de Compostela, Clinical Psychology and Psychobiology
REVIEW RETURNED	22-Feb-2021
GENERAL COMMENTS	The authors have addressed most of the comments that I made to the first version and I consider that the quality of the manuscript has increased. I would suggest the authors to review the writing format because there are some spelling mistakes along the manuscript. Besides, given the focus of the study slightly changed to the consideration of an ecological theoretical model in the explanation of aggression, perhaps the title of the study must be adapted accordingly. The discussion must not repeat or include statistical results (e.g., OR)

VERSION 2 – AUTHOR RESPONSE

Reviewer: 2
 Dr. Lorena Maneiro, Universidade de Santiago de Compostela, Leiden University
 Comments to the Author:
 The authors have addressed most of the comments that I made to the first version and I consider that the quality of the manuscript has increased.
 I would suggest the authors to review the writing format because there are some spelling mistakes along the manuscript.
Thank you for your comments and suggestions. We've checked the spelling very carefully this time.

Besides, given the focus of the study slightly changed to the consideration of an ecological theoretical model in the explanation of aggression, perhaps the title of the study must be adapted accordingly.
Thank you. We've adopted your suggestion and revised the title accordingly as : Correlations of impulsivity and aggressive behaviors among adolescents in Shanghai, China under the bioecological framework: A cross-sectional data from Global Early Adolescent Study

The discussion must not repeat or include statistical results (e.g., OR)
We've deleted the statistical results in the discussion in our revised manuscript.

Reviewer: 1
 Dr. Alexander Wasserman, The University of Texas Health Science Center at San Antonio
 Comments to the Author:
 Review of Manuscript Number: bmjopen-2020-043785.R1
 Summary: The authors were responsive to my comments and the revisions have improved the quality of the manuscript. After a careful read, I have a few remaining suggested revisions:
 1. In the introduction, the authors cite Bronfenbrenner's bioecological model as a framework relevant to the present investigation. However, it remains unclear, at least in the context of the introduction, how the theory is applied to the present investigation. I would urge the authors to be more careful in their description. For example, they state that parents can buffer their child's propensity towards anger or that healthy peer relationships can also reduce aggressive acts. Neither of these possibilities were addressed in the present study (though I acknowledge that any single study does not need to exhaustively test a theoretical model). As such, I would recommend that the authors are more selective in their description of the theory as it pertains to the present study.
We'd like to clarify that we had the result regarding family and peer influences in our study, which is why we chose to use the Bronfenbrenner's bioecological model as the framework. Instead of using

parents' care we used care from primary caregivers, which we think is more important for youth. For the peer factor, in our study, we used two variables: one is the number of close friends (though in the multivariate result, it is insignificant), the other is the being-bullied experiences.

The effect of family and peer influences we detected could be found in Table 3, page 11.

To better illustrate the link between the model and our study, in the discussion, we added that "The Bronfenbrenner's bioecological model supports the finding in our study that better family care is negatively related to adolescent boys' aggression" (line 26-27, page 15). and "Consistent with the bioecological model as well as the previous research that school-related tensions were significant predictors of aggression, our study also suggested that peer bullying was associated with a higher risk of aggressive behavior" (line 22-25, page 16)

2. When describing the BIS the measure, I was unsure what "partly items were scored transpose" meant. Can the authors please elaborate? Perhaps this was meant to describe reverse-coded items?

Sorry for making you confused. Yes, you are right. We meant to describe the reverse-coded items. We've changed the sentence into "After reversely coded the negatively worded items, we calculated the mean scores of the scales. Higher scores indicated greater impulsiveness."(line 20-21, page 7) to make it clearer.

3. Throughout the manuscript, it would be more useful to describe summary averages for the BIS rather than averages based on the Likert-scale responses. Reporting summary scores is more consistent with previous research and more readily interpretable.

Because in our paper, we used the mean score of each scale in the analysis, for the consistency of the paper, we think it is better to describe the mean score instead of the total score. As we explained in our previous response letter, our sample is young adolescents and the majority of whom are ordinary and normal people. The sample is unlike the patients who are suitable for calculating the BIS total score for applying the impulsivity diagnosis criteria (over 72 in total score). Still, this sample is also very worth exploring. Nonetheless, we've added the description of summary scores of total BIS scale and BIS sub-scales in the supplementary table S4 as you suggested to provide the information for comparison with other researches.

4. When transforming a continuous variable to a categorical variable without meaning cut-offs (such as the tertile split for the BIS), I think the authors need to acknowledge that a limitation of this approach is that they are assuming an underlying qualitative difference between the groups, which may not exist or replicate between other studies.

Thank you for reminding. We've addressed it as a limitation as follows: "Third, instead of using sum-up scores, we used the tertile to categorize the BIS score in the interest of making better use of existing data. Statistically, it would assume an underlying qualitative difference between the groups, although such assumption may not exist or be replicated by other studies. However, we did calculate the summary score of impulsivities, grouping by gender and aggressive behavior (supplementary table S3); the result is consistent with what we presented using tertile splits." (28-29, page 17 and 1-4, page 18)

a. Relatedly, unless I missed it, it would be helpful to describe the mean BIS scores for each tertile and gender distribution.

We've added the mean BIS cores for each tertile and gender distribution in the supplementary table S1 and indicated it in line 26-27, page 7 in the method part.

b. The authors are citing skewness in the BIS scores as justification for using tertile cutoffs. As such, please report the skewness of the raw scores in the measures section.

Thank you for pointing this out. It is my fault for not reviewing the formerly revised paper carefully. The skewness of the BIS scores is for the justification of using the median to dichotomize the BIS score in the first draft of the manuscript. It might not be an appropriate justification in the explanation of using the tertile split. In the revision, we deleted this justification and revised it as "Because of the absence of generalized cut-off values among youth across researches, and the interest ous to see the changes of aggressive behaviors with increased levels of impulsivity, we split the continuous mean scores into tertiles in the multivariate regression model (The mean BIS cores of total- and sub-scale for each tertile among boys and girls were exhibited in the supplementary table S1)."(line 22-27, page

7). And we also listed the skewness in the supplementary table S1 together with the description of the mean score for each tertile among boys and girls.

5. Please proofread, there are grammatical errors and typos throughout the manuscript. For example, in Table 3 and in the text the ~ symbol is used and I'm not sure if the authors meant to use a dash instead
Thank you for pointing it out. We've deleted all the unnecessary use of ~ symbol and replace it with dash when needed.

VERSION 3 – REVIEW

REVIEWER	Wasserman, Alexander The University of Texas Health Science Center at San Antonio, Psychiatry
REVIEW RETURNED	09-Jun-2021
GENERAL COMMENTS	I appreciate the authors careful attention to my suggested revisions and have no further major concerns. A minor issue is that "researches" is used fairly consistently throughout the manuscript instead of "research" or "researchers" (e.g., page 6, line 6) if the authors could please correct those typos.