

Parental Marital Conflict and Tobacco and Alcohol Use among Adolescents: A Moderated Mediation Model

Chang Wei¹, Chengfu Yu² & Min Gao²

Abstract

To explore the mediating effect of school bonding on the relationship between parental marital conflict and tobacco and alcohol use among adolescents, and the moderating role of sensation seeking in this mediating process. A total of 3,176 Chinese middle school students completed questionnaires regarding children's perception of interparental conflict, school bonding, sensation seeking, tobacco use, and alcohol use. The findings revealed that: (1) School bonding significantly mediated the relationship between parental marital conflict and tobacco use among adolescents; (2) School bonding significantly mediated the relationship between parental marital conflict and alcohol use among adolescents; (3) Sensation seeking significantly moderated the mediating process, "parental marital conflict→school bonding→tobacco use." More specifically, the mediating role of parental marital conflict was strengthened by reducing adolescents' school bonding, which was significant for adolescents with high sensation seeking but not for adolescents with low sensation seeking.

Keywords: Adolescents, parental marital conflict, sensation seeking, school bonding, tobacco and alcohol use

1. Introduction

Alcohol and tobacco use among adolescents has become one of the most serious public health problems and requires a prompt solution (Xia & Ye, 2014). In recent years, alcohol and tobacco use have become increasingly common for Chinese teenagers (Wang et al., 2018), and according to China's National Health and Family Planning Commission, in 2014, approximately 9.4 million Chinese junior middle school students had tried smoking, with a smoking rate of 6.4% overall, or of 10.6% and 1.8% for boys and girls respectively (Chinese Youth Tobacco Report, 2014); in addition, the Ministry of Health's Adolescent Health Risk Behaviour Control research group investigated nearly 370,000 middle school students from 28 provinces and found that the proportion of drinking history was as high as 70%. Moreover, in 2010, Ji reported a drinking rate of 36.4% for boys and 23.8% for girls. These statistics are of concern as empirical research demonstrates that adolescent alcohol and tobacco use can easily induce a series of psychological and behavioral problems amongst adolescents, such as problematic network use, aggressive behavior, drug abuse, depression, and suicide (Lin & Li, 2010; Yi, Ye, & Liu, 2016; Zhang et al., 2011). In view of the universality and harmfulness of tobacco and alcohol use among adolescents, it is necessary to examine the influencing factors and occurrence mechanisms of this phenomenon, to provide an empirical reference for scientific prevention and intervention.

Many studies have demonstrated that family environmental factors play a key role in the formation and development of tobacco and alcohol use among adolescents, and parental marital conflict is an important risk factor (Faircloth, Schermerhorn, Mitchell, & Cummings, 2011).

¹ School of Education, Hubei University of Science and Technology, Hubei Province, Xianning, Hubei 437000, China. Email: weichqq@163.com;

² School of Education, Guangzhou University, Guangzhou 510006, China.

Parental marital conflict refers to dissension or other contradictions between parents, which potentially result in verbal disputes or physical attacks (Chi & Xin, 2003). Empirical studies suggest that parental marital conflict can lead to tobacco and alcohol addiction amongst parents (Wade et al., 2014) and according to Social Learning Theory, in such cases, adolescents are very likely to imitate their parents' methods of escaping from frustration feelings (such as alcohol and tobacco use). As a result, they are more likely to use alcohol and tobacco when dealing with distress. It has also been proved that a good family atmosphere can effectively prevent and alleviate smoking and alcohol abuse among adolescents (Challier, Chau, & Perdine, 2000; Jones et al., 2006). In light of this, based on the views of Social Learning Theory and the results of empirical research, this research hypothesizes that parental marital conflict significantly correlates with tobacco and alcohol use among adolescents.

To better prevent and intervene in adolescent tobacco and alcohol use, it is not sufficient to explore the direct relationship between parental marital conflict and tobacco and alcohol use among adolescents; it is also necessary to further investigate the mediating process of parental marital conflict as it affects tobacco and alcohol use among adolescents. Another issue to be explored in this study is school bonding, which refers to the relationship between students and teachers, classmates, and the sense of school belonging (Simons & Wurtele, 2010). On the one hand, good school bonding can help prevent and restrain teenagers' tobacco and alcohol use. Social control theories suggest that students with a high degree of school bonding tend to work hard toward the expectations of their teachers and schools in order to obtain more support from teachers and classmates, and are thus less likely to engage in behaviors like tobacco and alcohol use; in contrast, those with a low degree of school bonding are less likely to receive support from their teachers or classmates, forcing them to form relationships instead with undesired peers, perhaps leading to a higher chance of misconduct such as fighting and brawling, tobacco and alcohol use, internet addiction, etc. Meanwhile, empirical studies have also demonstrated that good school bonding can help reduce tobacco and alcohol use among adolescents. For example, Connor et al. (2012) found that school bonding negatively predicts tobacco and alcohol use among adolescents. Doyle and Markiewicz's (2005) study also demonstrated that there is a significantly negative correlation between school bonding and adolescent tobacco and alcohol use, meaning that students with a high level of school bonding have lower tobacco and alcohol use. On the other hand, parental marital conflict can weaken teenagers' school bonding. According to Doyle and Markiewicz (2012), it is difficult for teenagers who have experienced parental marital conflict to form close and reliable relationships with others, or to establish strong school bonding by maintaining good relationships with their teachers and classmates as they grow up. Therefore, this study suggests that school bonding might be a key mediator in the relationship between parental marital conflict and tobacco and alcohol use among adolescents.

Although parental marital conflict can significantly affect adolescent tobacco and alcohol use either directly or indirectly, the extent of this impact undeniably varies among individuals. Thus, it is crucial to examine whether the impact of parental marital conflict on tobacco and alcohol use among young people can be moderated by factors other than school bonding. In this regard, Bronfenbrenner's (1989) Ecological Systems Theory claims that individual development is the result of the interaction between environmental factors and individual features (environmental factors \times individual self-features), a view that is also supported by the Differential Susceptibility Hypothesis, which states that individual social adaptation follows the same pattern (Belsky & Pluess, 2009). Sensation seeking refers to teenagers' sensational and experiential perceptions of new, varied, and exciting experiences, and the willingness to engage in risk to seek such experiences (Ye, Yang, & Hu, 2012). However, since the level of sensation seeking differs individually, the extent to which parental marital conflict affects adolescent tobacco and alcohol use also varies accordingly. Previous studies have demonstrated that those with a high level of sensation seeking are more likely to become addicted to smoking and drinking, as well as to engage in other problematic behaviors (Vitulano, Fite, & Rathert, 2010). This indicates that teenagers' sensation seeking positively predicts their tobacco and alcohol use (Yuan, Yu, & Tian, 2016). Meanwhile, the Cumulative Risk Model states that one risk factor can enhance the predictive effect of another risk factor on the outcome variable (Mackenzie, Kotch, & Lee, 2011). According to this model, a high level of sensation seeking might magnify the risk of tobacco and alcohol use among adolescents when they are facing parental marital conflicts. Therefore, this study predicts that there may be a significantly moderating effect on the mediating path of "marital conflict \rightarrow school bonding \rightarrow tobacco and alcohol use."

In Summary, the main objective of this study is to explore the effects of parental marital conflict, school bonding, and sensation seeking on adolescents' tobacco and alcohol use, and the underlying functioning mechanism between these factors.

Students from Chinese junior and high schools were recruited as the research subjects to gain progressive insight into the effect of parental marital conflict on tobacco and alcohol use among adolescents, as well as the mediating effect of school bonding and the moderating effect of sensation seeking. Based on the above hypotheses, a moderated mediation model is thus generated, as seen in Figure 1, which visually presents the theoretical concept and research purposes of this study.

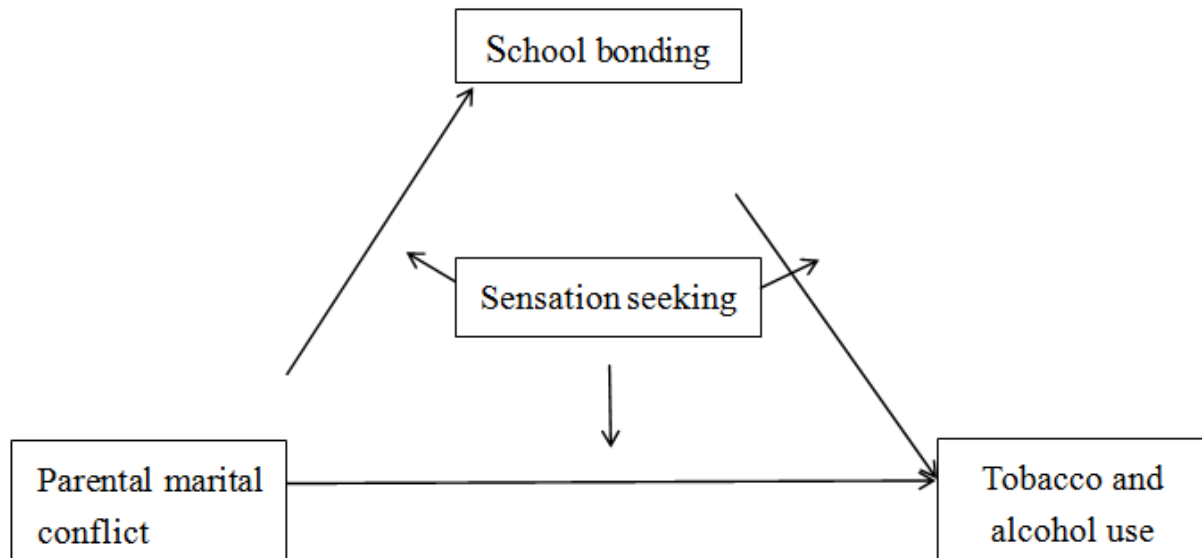


Figure 1 Conceptual model for the present study

2. Method

2.1 Participants

A total of 3,176 participants (1,508 male students; 1,668 female students) were recruited from several public secondary schools in Dongguan City and Guangzhou City, Guangdong Province, through convenience sampling. With regard to grade, 1,392 were junior middle school students and 1,784 were senior high school students with an average age of 14.93 years ($SD = 1.97$, age range = 10.25-21.25 years).

2.2 Instruments

2.2.1 Parental marital conflict questionnaire

Revised by Chi and Xin (2003), the Children's Perception of Inter-parental Conflict Scale consists of three subscales, "conflict properties," "threat," and "self-blame" (Durkee et al., 2012). This study adopted the subscale of "conflict properties" to measure adolescents' perception of parental marital conflict. This subscale contains three dimensions: frequency, intensity, and resolution of conflict. Participants' responses were graded on a four-point scale, ranging from 1 = "strongly disagree" to 4 = "strongly agree." Participants' responses to all items were averaged, with higher grades indicating a higher level of perception of parental marital conflict. The subscale adopted has been used widely in domestic and foreign studies and its reliability and validity have previously been proved (Ma et al., 2017). In this study, the coefficient of internal consistency (Cronbach's α coefficient) of this subscale is 0.82 ($\alpha = 0.82$).

2.2.2 Tobacco and alcohol use questionnaires

Alcohol use was measured by the alcohol use item used in Jiang et al.'s (2015) study. Participants were required to respond regarding the average number of times they had used alcohol per month in the past six months (including red wine, beer, etc.). They rated their responses on a six-point scale, ranging from 1 = "never" to 6 = "8 times or more." All item scores were averaged, with higher scores representing more alcohol use among adolescents.

Tobacco use was measured by the tobacco use item used in Jiang, Yu, Zhang, Bao, and Zhu's (2016) study. Participants were required to report the average number of times they had used tobacco per month in the past six months (responses rated on a six-point scale, ranging from 1 = "never" to 6 = "8 times or more") as well as the average number of cigarettes smoked on each usage occasion (graded on a six-point scale, ranging from 1 = "never" to 6 = "8 cigarettes or more"). The product of the respective average scores of number of occasions of tobacco use and number of cigarettes smoked on each tobacco usage occasion indicates adolescents' tobacco use, with higher scores demonstrating more tobacco use.

2.2.3 School bonding questionnaire

The present study adopted the Emotional Engagement subscale of the School Engagement Scale compiled by Wang, Willett, and Eccles (2011), which consists of eight items for participants to report their level of affective bonding with important people and things at school (such as teachers, classmates). School bonding was measured on a six-point scale, ranging from 1 = "strongly disagree" to 6 = "strongly agree." The responses across all eight items were averaged, with higher scores indicating a higher level of school bonding. For the current research, the internal consistency (Cronbach's α coefficient) of this scale is 0.72 ($\alpha = 0.72$).

2.2.4 Sensation seeking questionnaire

Sensation seeking was measured by the Chinese-version Sensation Seeking subscale of the Impulsive Behaviour Scale used by Wang et al. (2017). Adolescents responded to four items that reflect their level of sensation seeking (degree of impulsivity seeking). All items were measured on a four-point scale from 1 = "strongly agree" to 4 = "strongly disagree." A comprehensive score was produced by averaging the scores of four items, with a higher comprehensive score representing a higher level of sensation seeking. For the current study, the internal consistency (Cronbach's α coefficient) of this scale is 0.76 ($\alpha = 0.76$).

2.3 Procedure

After receiving the informed consent of the students themselves and the relevant teachers and school leaders, well-trained psychology undergraduates conducted group testing on a class basis. Questionnaire responses were completed anonymously in approximately 30 minutes and all questionnaires were then collected on the spot.

3. Results

3.1 Correlation analysis of variables

Table 1 presents the mean, standard deviation, and correlation matrices for the main variables involved in the current study. The results demonstrated that: (1) Parental marital conflict was significantly positively correlated with alcohol use, indicating that parental marital conflict is a risk factor for alcohol use among adolescents, and the greater the parental marital conflict, the greater the adolescent alcohol use. (2) Sensation seeking is significantly positively correlated with tobacco and alcohol use, representing that sensation seeking is a risk factor for tobacco and alcohol use among adolescents, and the stronger the sensation seeking, the greater the adolescent tobacco and alcohol use. (3) Parental marital conflict was significantly negatively correlated with school bonding, and school bonding was significantly negatively correlated with tobacco and alcohol use. These findings provide support for further testing of the mediating effect of school bonding and the moderating effect of sensation seeking.

Table 1 Mean, standard deviation, and correlated coefficient of each variable

Variables	<i>M</i>	<i>SD</i>	1	2	3	4
1. Marital conflict	1.99	0.55	1.00			
2. Sensation seeking	2.39	0.67	0.07**	1.00		
3. School bonding	3.98	0.76	-0.27**	-.09**	1.00	
4. Alcohol use	1.44	0.87	0.06**	.14**	-.16**	1.00
5. Tobacco use	1.11	0.64	0.02	.08**	-.10**	.28**

Note: The correlated coefficient was obtained by Bootstrap; * $p < 0.05$, ** $p < 0.01$.

3.2 Parental marital conflict and tobacco use: testing the moderated mediation effect

In this study, Model 59 in the PROCESS for SPSS proposed by Hayes (2013) was used to process the data of the moderated mediation model. Two regression equations were estimated to test the moderated mediation model. Equation 1 examined the moderating effect of sensation seeking on the relationship between parental marital conflict and the mediating variable (school bonding); Equation 2 examined the moderating role of sensation seeking as a moderating variable in the relationship between the mediating variable (school bonding) and tobacco use as a dependent variable, as well as the moderating effect of sensation seeking as an independent variable on the residual effect of tobacco use as a dependent variable.

Previous studies have noted that gender, age, parents' educational level, and family members' per capita income are important factors leading to tobacco use among adolescents (Liao et al., 2014). Therefore, the present research incorporated the above variables as control variables into each regression equation. In accordance with Wen, Zhang, and Hou (2006), prior to data processing, this study centralized all the predictors.

As shown in Table 2, the study found that: (1) In equation 1, both parental marital conflict and sensation seeking significantly predicted school bonding ($b_1 = -0.33$, $b_2 = -0.07$, $p_s < 0.01$), but the interactive effect of parental marital conflict and sensation seeking on school bonding was not significant ($b = 0.04$, $p > 0.05$). (2) In equation 2, school bonding significantly predicted tobacco use among adolescents ($b = -0.04$, $p < 0.01$), and the interaction between parental marital conflict and sensation seeking significantly predicted tobacco use ($b = -0.08$, $p < 0.01$).

Table 3 Testing the Moderated Mediation Effect

	Equation 1 Validity Criterion : school bonding			Equation 2 Validity Criterion : tobacco use		
	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β
Parental marital conflict X	-0.33	0.02	-0.24**	-0.02	0.02	-0.01
Sensation seeking MO	-0.07	0.02	-0.06**	0.06	0.02	0.07**
X × MO	0.04	0.03	0.02	0.00	0.03	0.00
School bonding ME				-0.04	0.02	-0.05**
ME × MO				-0.08	0.02	-0.07**
Gender	-0.12	0.03	-0.08**	0.20	0.02	0.15**
Age	-0.05	0.01	-0.14**	0.04	0.01	0.13**
Paternal educational level	0.01	0.02	0.01	0.01	0.01	0.01
Maternal educational level	0.02	0.01	0.04	-0.02	0.01	-0.03
Household income per capita	-0.02	0.01	-0.04*	0.01	0.01	0.04
<i>F</i>	47.39**			18.42**		
<i>R</i> ²	0.11			0.05		

Note: unnormalised regression coefficients were obtained through the Bootstrap method; * $p < 0.05$, ** $p < 0.01$.

To explain more clearly the essence of the significantly interactive effects of school bonding and sensation seeking on tobacco use, this study further conducted a simple slope test. The effect value of school bonding's effect on tobacco use was calculated when sensation seeking served as a mean plus or minus standard deviation, and based on the regression equation, both the plus/minus standard deviation of the mean and the average number of school bonding and sensation seeking were respectively calculated to draw an analytical diagram of simple effect.

As shown in Figure 2, the results found that: (1) for adolescents with low level sensation seeking, school bonding was not significantly correlated with tobacco use among adolescents; (2) for adolescents with high level sensation seeking, school bonding was significantly negatively correlated with tobacco use among adolescents.

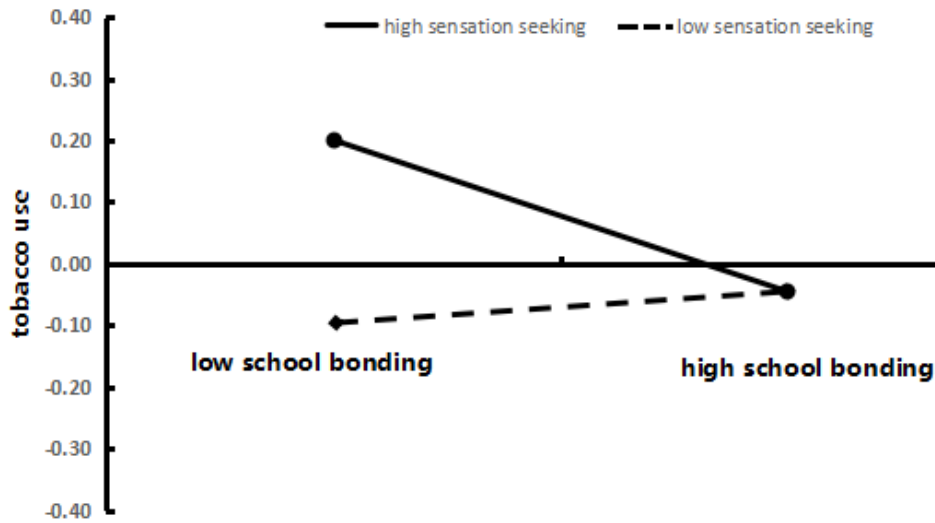


Figure 2 The moderating effect of sensation seeking in the relationship between school bonding and tobacco use

3.3 Parental marital conflict and alcohol use: testing the moderated mediation effect

In the current study, Model 59 in the PROCESS for SPSS proposed by Hayes (2013) was used to process the data of the moderated mediation model. Two regression equations were estimated to test the moderated mediation model. Equation 1 examined the moderating effect of sensation seeking on the relationship between parental marital conflict and the mediating variable (school bonding); Equation 2 examined the moderating role of sensation seeking as a moderating variable in the relationship between the mediating variable (school bonding) and alcohol use as a dependent variable, as well as the moderating effect of sensation seeking as an independent variable on the residual effect of alcohol use as a dependent variable.

Previous studies have noted that gender, age, parents' educational level, and family members' per capita income are important factors leading to alcohol use among adolescents (Lin et al., 2008). Therefore, the present research incorporated the above variables as control variables into each regression equation. According to Wen, Zhang, and Hou (2006), prior to data processing, this study centralized all the predictors.

As shown in Table 2, the study found that: (1) In equation 1, both parental marital conflict and sensation seeking significantly predicted school bonding ($b_1 = -0.33$, $b_2 = -0.07$, $p < 0.01$), but the interactive effect of parental marital conflict and sensation seeking on school bonding was not significant ($b = 0.04$, $p > 0.05$). (2) In equation 2, school bonding significantly predicted alcohol use among adolescents ($b = -0.15$, $p < 0.01$), and the interaction between parental marital conflict and sensation seeking significantly predicted alcohol use ($b = -0.02$, $p > 0.05$).

Table 3 Testing the Moderated Mediation Effect

	Equation 1 Validity Criterion : school bonding			Equation 2 Validity Criterion : alcohol use		
	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β
Parental marital conflict X	-0.33	0.02	-0.24**	0.03	0.03	0.02
Sensation seeking MO	-0.07	0.02	-0.06**	0.15	0.02	0.11**
X × MO	0.04	0.03	0.02	-0.01	0.04	-0.01
School bonding ME				-0.15	0.02	-0.13**
ME × MO				-0.02	0.03	-0.01
Gender	-0.12	0.03	-0.08**	0.22	0.03	0.13**
Age	-0.05	0.01	-0.14**	0.03	0.01	0.07**
Paternal educational level	0.01	0.02	0.01	0.03	0.02	0.04
Maternal educational level	0.02	0.01	0.04	-0.01	0.02	-0.02
Household income per capita	-0.02	0.01	-0.04*	0.03	0.01	0.07**
<i>F</i>	47.39**			22.04**		
<i>R</i> ²	0.11			0.06		

Note: unnormalised regression coefficients are obtained through the Bootstrap method; * $p < 0.05$, ** $p < 0.01$.

4. Discussion

4.1 Parental marital conflict positively predicts alcohol use among adolescents

Our results found that parental marital conflict significantly positively predicts alcohol use among middle school students, indicating that the greater the parental marital conflict, the greater the alcohol use among middle school students. This finding is consistent with Fang and Dong's (2011) findings. According to Social Learning Theory, teenagers' perception of parental marital conflict is an implicit learning process. In the context of parental marital conflict, parents' methods and ways of resolving negative emotions (such as alcohol use) invisibly encourage alcohol use among teenagers. Meanwhile, Fang, Zhang, and Xu (2004) found that adolescents' understanding of parental marital conflict is subjective and negative, and they are prone to perceiving conflicts as more negative than their parents perceive them. Therefore, adolescents who are exposed to parental marital conflict are more likely to develop negative emotions such as anxiety and depression, which may lead to behavioral problems such as alcohol use. This study directly validated Social Learning Theory and related empirical research (Su et al., 2017), indicating that parental marital conflict is a vital risk factor for alcohol use among adolescents.

4.2 The mediating effect of school bonding

This research introduced the concept of school bonding to further investigate the mediation mechanism of parental marital conflict's effect on tobacco and alcohol use among adolescents. The findings were in line with the previous research hypothesis, proving that school bonding significantly and fully mediated the risk effect of parental marital conflict on adolescents' tobacco and alcohol use. In other words, parental marital conflict strengthened the tendency for tobacco and alcohol use among adolescents by weakening their school bonding, which is also inconsistent with Social Control Theory. The findings also demonstrated school bonding's significantly mediating effect on the relationship between parental marital conflict and adolescent misbehavior.

Similarly, in their research on middle school students in grades 7 to 9, Yu et al. (2017) found that school bonding completely mediated the relationship between parental corporal punishment and adolescent internet game addiction. In another study on students from grades 7 to 12, Liu et al. (2016) discovered that school bonding played a

significant role in mediating the relationship between parental marital conflict of middle school students and their problematic behaviors. The results of the present study also supported Ecological System Theory, which states that environmental factors and individual features had an interaction influence on individual development. The current research also emphasized the mediating effect of school bonding on the relationship between parental marital conflict and tobacco and alcohol use among adolescents, providing a basis for further prevention and intervention in tobacco and alcohol use among adolescents.

4.3 The moderating effect of sensation seeking

Meanwhile, the present research further examined the moderating effect of sensation seeking on the mediating path of “parental marital conflict → school bonding → tobacco and alcohol use.” The results found that sensation seeking significantly moderated the indirect effect of parental marital conflict on tobacco use among adolescents, and the moderating point is located in the second half of the mediating path. That is, the relationship between school bonding and tobacco use was moderated by sensation seeking. Specifically, among adolescents with low level sensation seeking, school bonding is not significantly correlated with tobacco use, whereas for those with high level sensation seeking, school bonding is significantly negatively correlated with tobacco use. In other words, when individuals feel low level sensation seeking, the inhibitory effect of school bonding on tobacco use among adolescents is not evident, but when individuals feel high level sensation seeking, school bonding has a significant inhibitory effect on tobacco use among adolescents. This is consistent with both the present research hypotheses and previous studies on the moderating effect of sensation seeking. For example, high level sensation seeking enhances the effect of deviant peer affiliation on adolescents’ tobacco and alcohol use (Xia & Ye, 2017) and, relative to low level sensation seeking, it magnifies the adverse effect of deviant peer affiliation for drug use among reform school students (Ye, Yang, & Hu, 2012). The Equivalence and Pleiotropic Development Hypothesis suggests that different risk factors may lead to similar development outcomes for individuals, while the same risk factor may trigger various development outcomes for individuals (Kretschmer et al., 2015).

For the present study, adolescents who experienced the same level of parental marital conflict had individual differences in school bonding and tobacco use (development outcomes), perhaps due to the moderating effect of sensation seeking. Most previous studies have examined the effect of environmental factors and individual characteristics on individual development outcomes (such as tobacco use), but the related and interactive effects of influencing factors were ignored. The current research constructs a moderated mediation model that reveals the interactive effect of environmental factors (parental marital conflict and school bonding) and self-features (sensation seeking) on the formation and development of tobacco use among adolescents, which provides a scientific basis for practical intervention.

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