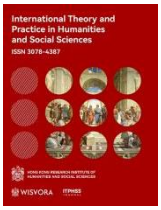
WISVORA

International Theory and Practice in Humanities and Social Sciences
2025 Volume2,Issue ISSN 3078-4387



The influence of power sense on teenagers' cooperation affection: The moderating effect of age

Lei Zhang[1], Qiuqiang Zheng[2], Syed Mohamad Syed Abdulla[3], Feifei Li[4*]

[1] School of Education Sciences, Zhaoqing University, Zhaoqing, China
[2] School of Education Sciences, Huizhou University, Huizhou, China
[3] School of Educational Studies, Universiti Sains Malaysia,Penang, Malaysia
[4] Department of Art, Shandong Agricultural University, Taian, China

Accepted

2025-05-18

Keywords

Power sense; Teenager; cooperation affection; Age

Corresponding Author

Feifei Li

doi.org/10.70693/itphss.v2i6.746

Abstract

Cooperation affection is a manifestation that can reflect an individual's emotional tendency (positive or negative) towards cooperation. Some research results show that power reduces cooperation; however, other research results show that power might increase cooperation. To understand the contradictory relationship between power and cooperation, the current study explored the influence of power sense on teenagers' cooperative emotion (cooperation affection) among different ages (including middle school students, high school students, and university students) and found that: there was a significant decline in the cooperation affection among teenagers as they aged and gender had a marginally significant impact on teenagers' cooperation affection; power positively predicts cooperation affection; age moderates the effect of power on the cooperation affection, which meant the influence of power sense on old teenagers' cooperation affection was more significant.

1. Introduction

Cooperation is widespread in the animal kingdom and human society. There may be cooperation between members of species within the animal kingdom (e.g., ant colonies) and even between members of different races (e.g., rhinobirds and rhinos). In human society, there may also be cooperation within related or familiar populations, as well as between unrelated individuals or members of different groups. Early in human society, cooperation (e.g., cooperative hunting) helped increase the chances of group members surviving and reproducing (Szathmáry, 2011). Human civilization is also based on cooperation: language is one of the key conditions for the formation of human civilization, and early language formation depends on cooperation among its members (Bickerton & Szathmáry, 2011). In general social production, cooperation can encourage organizational members to engage more in creative and spontaneous activities, improve organizational productivity and economic performance, and resolve group

conflicts (Lee, 2011). Cooperation can be divided into cooperative emotion, cooperative cognition and cooperative behavior (Fiebich, 2019). Most of the current research has focused on cooperative behavior, and few studies have studied cooperative emotion. The cooperation affection mainly refers to the emotional aspect of cooperation, that is, a positive emotion that is willing to cooperate with others and can experience in the process of cooperation. The concept of cooperation affection was first proposed by Lu (2009a), who believed that adolescents' cooperation affection is an emotion in the adolescent emotional quality system. Lu *et al*. (2009b) conducted a nationwide study in China on adolescent emotional quality, and found that adolescent emotional quality includes two levels, six categories and 42 specific emotions. The two levels refer to the ontological level of emotions (moral emotions, intellectual emotions, aesthetic emotions, life emotions, interpersonal emotions) and the operational level of emotions (emotional ability). Among them, the cooperation affection belongs to interpersonal emotions, which refers to the emotion of being willing to cooperate with others. "cooperation affection" is an extension of "cooperation", which exists in all aspects of social life, while "cooperation affection" is a psychological concept that studies cooperative behavior from an emotional perspective. In general, the cooperation affection is a positive emotion that is willing to cooperate with others and can be experienced in the process of cooperation, mainly in two dimensions: one is the willingness to cooperate, that is, the willingness to cooperate with others; The second is emotional experience, that is, positive emotions can be experienced in cooperation. The cooperation affection is more emotional than cooperation. This study firstly foucusd on teenagers' level of cooperation affection.

Among the many factors that influence cooperation, power sense is a very important one. According to the summary of a large number of cooperative studies, we can understand that there are two main factors affecting individual cooperation, one is individual factors and the other is situational factors. In terms of situational factors, the research has been very in-depth, and different scholars have conducted research according to different perspectives, such as task structure, reward, punishment mechanism, feedback mechanism and so on. In terms of individual factors, existing studies have explored individual characteristics, motivations, social value orientations and other perspectives. We note that as part of the individual factor, power sense can have a huge impact on all aspects of an individual's decisions and actions. Research in the field of human interaction has reached inconsistent conclusions about the impact of feelings of power on cooperation. Research by scholars supports the conclusion that power leads to more collaboration (Van Dijk & Wilke, 1995; De Cremer & Tyler, 2007), but others argue the opposite, arguing that power leads to less cooperation (Kimbrough *et al*., 2014; Avrahami, Kareev *et al*., 2014; Liu & Hao, 2015). As the emotional component of cooperation, what is the impact of a sense of power on it? Whether to promote or inhibit is a question that this study wants to explore.

In addition, according to the Fuzzy-trace theory, an individual's decision-making system changes as they age. Early childhood individuals are mainly based on verbatim analysis and processing, and individuals will shift from relying on verbatim processing to relying on gist processing as they age (Miller & Bjorklund, 1998). Brainerd *et al*. (2011) argued that both verbatim-based analysis and gist-based intuition develop during childhood, and sometimes the latter develops at an even faster speed than the former. The preference for operating on gist in reasoning and decision-making also increases during this period (Reyna & Kiernan, 1994; Reyna & Kiernan, 1995). In general, the influence of power on cooperation is more influenced by heuristic systems or gist-based representations of influences (Liu *et al*., 2014). For example, the impact of the cooperation index on cooperation is more affecting the human analysis system, more because it is clearly found that the higher the cooperation index, the higher the benefit of

choosing cooperation, so individuals choose to cooperate more through analysis and trade-off (Lu *et al*., 2016). According to fuzzy-trace theory, we believe that in early adolescence, individual decisions are more based on the analysis system. That is, early adolescents are more based on verbatim processing, and more will choose according to the benefits of choice. The level of their socialization is relatively low, and they choose more from the positive degree of the results when choosing cooperation or competition. As age increases, their degree of socialization gradually rises, and in a sense, Chinese society is an acquaintance society, or Chinese people have "official standard" thought (Wang, 2018). That means people consider power as an important thing (You *et al*., 2010) and power may serve as an important factor affecting an individual's emotion, cognition, and behavior. Thus, the social culture of this view of power has an impact on the decision-making system of adolescents. Therefore, this study wanted to explore whether age affects the effect of power sense on adolescents' cooperation affection.

2. Method

2.1 Sampling

Using the cluster sampling method, 1200 questionnaires were distributed in one middle school, one high school and one university in Huizhou city, Guangdong province, China. Finally, 1055 valid questionnaires were recovered, with an effective rate of 93. 83%. The age group of the students involved in this study is 12~25 years old (mean = 17.37, SD = 2.74).

2.2. Measures

2.2.1 Scale of personal power

Using the Scale of Personal Power developed by Anderson *et al*. in 2012, the scale has been proven for many years and has good reliability and validity. There are 8 questions in the scale, such as "I can get him/her/them to listen to what I say", which are self-assessment tests. Chen *et al*. (2009) noted that the internal consistency coefficient of this scale (α) is not less than 0.80. This scale generally uses a 7-point score, and some scholars use a 5-point score, such as the study of Harms et al. (2007).

2.2.2 Scale of cooperation affection

Using Sun's (2012) self-compiled scale of cooperation affection, it contains 15 items and is subordinate to a single dimension. Each item was scored on a six-scale scale from "disagree strongly" to "agree strongly" with a total score of 15 items indicating a cooperation affection. The higher scores, the higher cooperation affection. The questionnaire structure was well valid, and the analysis of confirmatory factors showed that $\chi 2$ (90) = 451. 53、CFI = 0. 954、GFI = 0. 907、AGFI = 0. 876、NNFI = 0. 947、RMSEA = 0. 078. The internal consistency coefficient is 0. 729.

2.3 Research Procedure

The study was carried out in a middle school, high school, and university which were selected in Huizhou, Guangdong province of China. Questionnaires were distributed to students in the second grade of middle school, high school, and university. After the distribution of questionnaires, we screened the collected questionnaire and tested the authenticity and integrity of the questionnaire's answers. If there existed too many unanswered questions or obvious response tendencies or obvious regularity in the questionnaires, we removed them as invalid questionnaires. Finally, the valid questionnaires were recovered.

3. Results

3.1 Test of common method bias

Considering common methodological biases, the need for truthful answers was emphasized in the guidelines of the questionnaire, and reverse questions were added. Students were asked to answer anonymously during the testing process. According to Podsakoff's suggestion, the Harman one-factor (Malhotra *et al*., 2006; Zhou & Long, 2004) test was used to analyze all items of the two psychological variables, and the common factor variance interpretation rate of the first feature root greater than 1 was 22.85%, which was much lower than the 40% (decision value). Therefore, the common method deviation was not obvious.

3.2 Characteristics analysis of teenagers' cooperation affection

The data shows that the average score of cooperation affection of 1055 students is 4.15 (SD = 0.68). The relationship between age and cooperation affection is shown in Figure 3.1. Here we use three graph types to illustrate the relationship between age and the cooperation affection, mainly including scatter plots, histograms, and the regression line of age to the cooperation affection. The scatter plot and the regression line are to better show the relationship between age and cooperation affection, while the column diagram is to visually show the characteristics of the cooperation affection in different age stages (middle school, high school, and university).

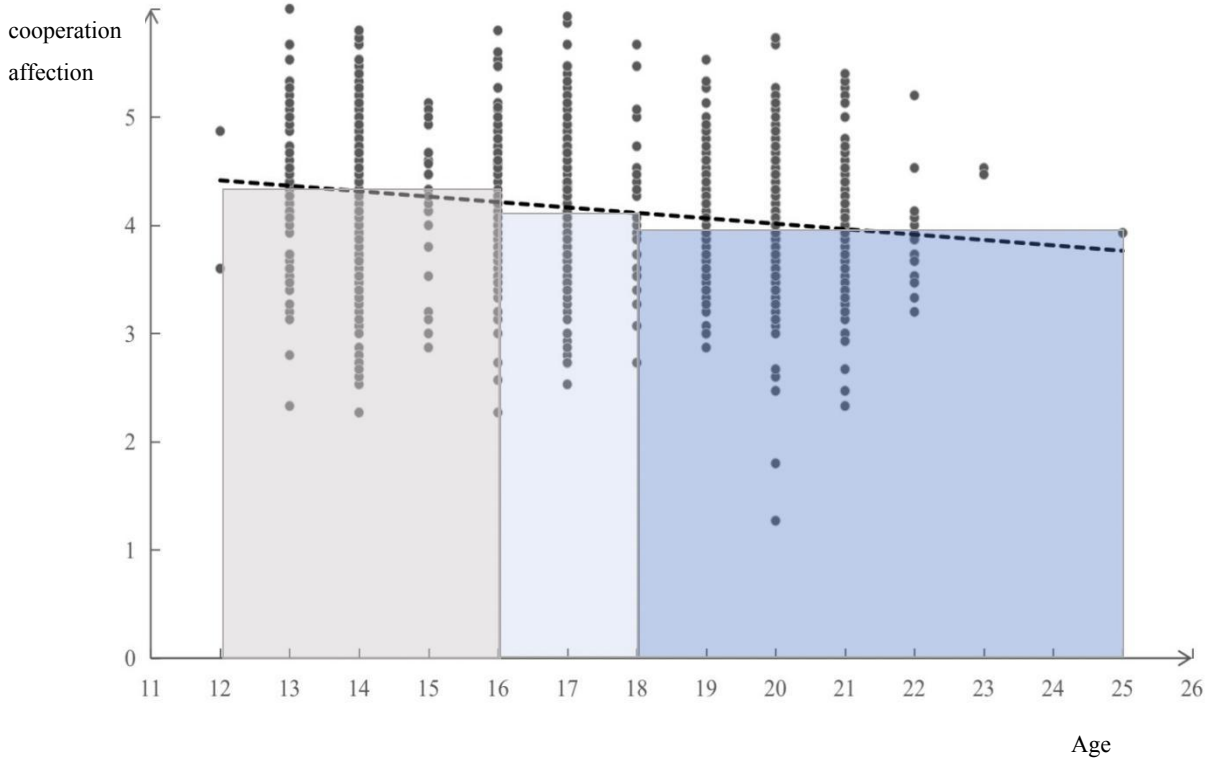


Figure 3.1 The relationship between age and cooperation affection

Note: the abscissa is the age of the subject, the ordinate is the score of cooperation affection, and the. dotted line is the linear regression of the cooperation affection on age. The column indicates the mean cooperation affection of middle school students (12 ~ 16 years old), high school students (16 ~ 18) and university students (18 ~ 25).

Unitary linear regression analysis was conducted to examine whether age was associated with the cooperation affection. The model predicting cooperation affection was significant, $F(1, 1050) = 45.01$, $p < 0.001$, $R^2 = 0.04$, $\beta = -0.20$, that is, cooperation affection decreases with age. Differences in gender, grade, and other aspects are shown in Table 3.1.

Table 3.1 Differences of the cooperation affection scale in gender, grade, and other aspects

Demographic variables		Number	Score of cooperation affection		t/F
			Mean	SD	
Gender	Male	351	4.09	0.72	-1.89 (p = 0.059)
	Female	682	4.18	0.65	
Grade	Middle	307	4.31	0.74	22.18***
	High	291	4.21	0.67	(M = H > U)
	University	457	4.00	0.60	

Note：M: Middle school student, H: High school student, U: University student; *p < 0.05，**p < 0.01，***p < 0.001

According to Table 3.1, we found that gender had a marginally significant impact on the cooperation affection. Independent Samples Test was used to discover the gender's influence. We first assumed equal variances and found F (1, 1031) = 2.82, p = 0.09 > 0.05, thus equal variances assumption was true. Then we did the T-test and found t = -1.89, p = 0.059, that is, females' cooperation affection (Mean = 4.18, SD = 0.65) was marginally significantly higher than that of males (Mean = 4.09, SD = 0.72).

Grade had a significant impact on the cooperation affection. We used one-way ANOVA analysis and found F (2, 1052) = 22.18, p < 0.001. After the one-way ANOVA analysis, we used LSD post-mortem multiple comparisons which was as followed in Table 3.2 and found that there was no significant difference between middle school (Mean = 4.31, SD = 0.74) and high school students (Mean = 4.21, SD = 0.67) in the score of cooperation affection which were much higher than that of university students (Mean = 4.00, SD = 0.60).

Table 3.2 Multiple comparisons of LSD in sense of cooperation in teenagers at different grades

(I) grade	(J) grade	Mean Difference (I-J)	Sig.	(95% Confidence Interval)	
				Lower Bound	Upper Bound
M	H	0.097	0.075	-0.098	0.203
	U	0.312***	0.000	0.216	0.408
H	M	-0.097	0.075	-0.203	0.098
	U	0.215***	0.000	0.117	0.313
U	M	-0.312***	0.000	-0.408	-0.216
	H	0.215***	0.000	-0.313	-0.117

Note：M: Middle school student, H: High school student, U: University student; *p < 0.05，**p < 0.01，***p < 0.001

3.3 The impact of power on teenagers' cooperation affection

Unitary linear regression analysis was conducted to examine the relationship between power and cooperation affection. The model predicting cooperation affection was significant, F (1, 1053) = 46.75, p < 0.001, R^2 = 0.04, β = 0.21, that is, power positively affects teenagers' cooperation affection. And we did corrlation analysis which was shown in Table 3.3. The correlation analysis results show that age is positively correlated with power (r = 0.22) and cooperation affection (r = -0.24), grade is positively correlated with power (r = 0.25) and cooperation affection (r = -0.20) and the sense of power of teenagers is positively correlated with cooperation affection (r = 0.21) .

Table 3.3 Means, standard deviations, and bivariate correlations among key variables

Variable	1	2	3	4	5
Age					
Grade					
Gender					
Power	0.22***	0.25***	0.03		
CA	-0.24***	-0.20***	0.06	0.21***	
M	17.37			4.31	4.15
SD	2.74			0.80	0.68

Note：CA: Cooperation affection; *p < 0.05，**p < 0.01，***p < 0.001

3.4 Analysis of the moderating effect of age on the role of power in the cooperation affection

We found that age positively correlated with sense of power and negatively correlated with cooperation affection in the teenager group by the correlation analysis. Then we tested the moderating effect by using the PROCESS macro for SPSS (Hayes, 2012). We chose Model 1 and set the number of autonomous samplings to 5000 times, using Bootstrap to test the significance of the regression coefficients. The moderating effect is significant if the 95% deviation correction confidence interval (CI) of the cross-term does not contain zero. The results showed that the confidence interval of the intersection of age and power was [0.0013, 0.0367] (excluding zero) when taking the cooperation affection as the dependent variable. Therefore, the regulating effect of age was significant. What's more, we also tested the moderating effect of grade by using the same method and found that the confidence interval of the intersection of grade and power was [0.0003, 0.1139] (excluding zero) when taking the cooperation affection as the dependent variable. So, the moderating effect of the grade was still significant.

The simple slope analysis was used to explore the moderating effect of age. We took the middle school student as the early teenager group and the university student as the old teenager group. The sense of power score was grouped into high and low groups, with the top 27% as the high group and the last 27% as the low group. Firstly, unitary linear regression analysis was carried out by taking the cooperation affection as the dependent variable and sense of power as the independent variable in the high and low-power groups. Two regression equations were obtained.

Early teenager group: $y_1 = 0.11x_1 + 3.87$

Old teenager group: $y_2 = 0.28x_2 + 2.75$

Then, the means of the low-power group ($x = 3.84$) and the high-power group ($x' = 5.27$) were calculated and were brought into the two regression equations, getting and the scores of cooperation affection under the conditions of the high-power group and the low-power group. From the interaction effect figure made by this, the regulating effect of age on the effect of sense of power on the cooperation affection is significant , which is as shown in Figure 3.2.

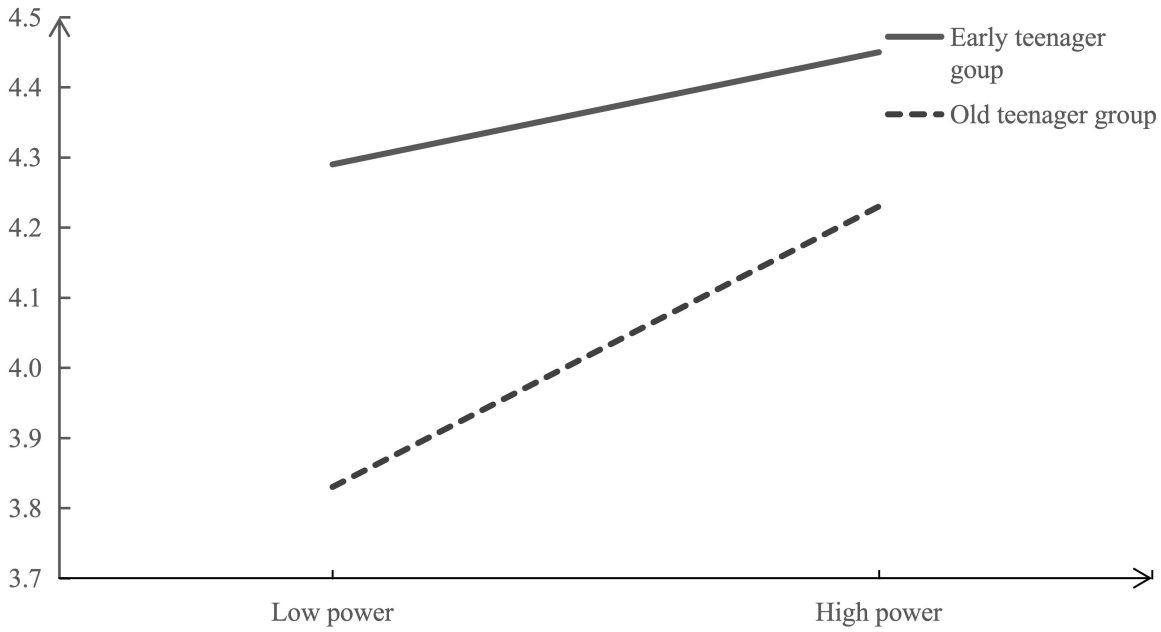


Figure 3.2 The moderating effect of age on the effect of power on teenagers' cooperation affection

4. Discussion

According to the results section, we found that adolescents' cooperation affection gradually decreased as they aged. cooperation affection is a kind of interpersonal emotion, which refers to a feeling of emotional willingness to cooperate with others. From the result part, we found that both age and grade have a significant effect on teenagers' cooperation affection, that is, teenagers' cooperation affection decreases with age (grade). On the one hand, individuals will pay more and more attention to their inner selves as their self-awareness is growing. Self-awareness means that a person could understand and evaluate oneself correctly. One's own complete personality must be formed on the basis of correct self-awareness. After that, a person could moderate and control his own behavior and thoughts (Lingyan & Dianli, 2021). Generally speaking, teenagers try to report and compare with other members of society especially peer groups continuously so that they can form an identity. What's more, the teenager group also feels that it is necessary to differentiate the group, look for those elements which make them fail to distinguish from others, to shape a unique identity, original (Waterman, 1982; Sandu *et al*., 2015). The increasing self-awareness and adult consciousness are encouraging teenagers to get rid of the independence of others to seek self-sufficiency. To reflect their own value, teenagers will prove their ability by choosing to express themselves and show themselves, that is, emotionally they are not willing to choose to cooperate.

On the other hand, from the perspective of contemporary family education, school education and social culture, the reality is more to encourage individual to compete, such as performance rankings, performance appraisals and so on, which means the score is still the important determinant of students' rankings (Zheng, 2022). In this way, the socialization of the individual naturally leads to a decrease in the cooperation affection among teenagers. Combined with the actual situation, from middle school to high school, the main reason for the decrease in the cooperation affection is that compared with middle school, the learning pressure of high school is

greater, and the university entrance examination is very important for students in China, and more emphasis is placed on the individual level rather than the collective level. From high school to university, the main reason for the decrease in the cooperation affection may come from the bad experience of cooperation among classmates. Through interviews with some university students, we found that the way of learning at university is very different from high school. Many students said that most of the university's course assessments will involve group work and their experience of group work is not very good. Since the group may consist of students with different levels of ambition, their interest, commitment as well as the willingness to take on responsibilities or part of the workload of the group's work may also be different. That is, some members do much of the work, while others don't contribute at all (Hammar Chiriac, 2014). Generally, students do the group work after class which means this process could not be supervised directly by the teacher (Volet & Mansfield, 2006). Besides, there are so many students in a class and teachers cannot monitor the cooperation process of each group, which leads to some students will get free ride in group work (cooperation), that is, without effort to get the same score as others. At the same time, in the grouping of group learning, teachers mostly use random groups and voluntary combinations, resulting in which students with good relationships (especially those in the same dormitory) will be in a group. Even if some students are not serious or engaged in group work, other students will be embarrassed to bring it up because of interpersonal relationships, which has the phenomenon of some people "free ride" mentioned above, and some students are forced to choose not to speak due to interpersonal relationships, which will cause an imbalance among students who actively participate and discourage learning (Zheng, 2022). Students are reluctant to punish free-riders and antipathy toward working in groups is often connected with a previous experience of having free-riders in the group (Peterson & Miller, 2004). The original intention of group work is to take full advantage of each other. However, the emergence of this "free ride" phenomenon will make students emotionally resent cooperation, resulting in a decrease in the cooperation affection.

This study showed that teenagers had a marginally significant effect on their cooperation affection. Male's cooperation affectionis marginally significantly lower than that of female. The results are in line with the views of Ruegera *et al*. (2008) and Jackson *et al*. (2008), who argue that women are superior to men in interpersonally emotional capacity. In addition, for boys who enter adolescence, they are more willing to show their personality and attract the attention of others through their personal performance, so they are less involved in teamwork and are reluctant to cooperate with others.

Power can further promote cooperation affection among adolescents. That is, individuals with a higher sense of power have a higher level of cooperation, that is, the more emotionally inclined to cooperate. This supports the conclusion of De Cremer *et al*. (2007) that in social dilemma, the stronger side is more inclined to cooperate. As a type of prosocial behavior, power increases the tendency of prosocial behavior, which is also consistent with the research of Galinsky *et al*. (2003). At the same time, according to the approach-inhibition theory of power (Keltner *et al*., 2003), people with high power will have more positive emotions and motivation in the organization because they will be more inclined to engage in altruistic behavior. At the same time, cooperation in real situations can often make both parties get more benefits, but also need to bear relative risks, individuals with a high sense of power may be more concerned about future benefits than losses and threats, so individuals with a high sense of power are more likely to make cooperative behaviors and have a higher cooperation affection.

Age can moderate the effect of sense of power on adolescents' cooperation affection. On the basis of the analysis of the results, we found that there was an age difference in the effect of the

sense of power on the individual's cooperation affection. The age group in the age difference here mainly includes early teenagers (this part mainly refers to middle school students) and old teenagers (this part mainly refers to university students). Although the effects of the sense of power on both groups of participants were significant, the growth trend of old teenagers' cooperation affection was significantly higher than that of the early teenagers according to the test results of the slope of the regression equation. This suggests that the level of cooperation affection of old teenagers is more likely to be moderated by a sense of power than that of early teenagers. The results of this study are generally consistent with our research hypothesis. That is, compared with young teenagers, old teenagers are more sensitive to the influence of power on cooperation affection. However, there exists a difference that the direction of power's effect is not seen as we thought. Here power can promote teenagers' cooperation affection. Firstly, these results also can be explained by the Fuzzy-trace theory. The Fuzzy-trace theory is formed by the link of fundamental concepts from psycholinguistic research and Gestalt theory with several curious empirical findings (Rivers *et al*., 2008). The older age group seems to be more likely to focus on global patterns in judgment and decision-making, while younger groups are more likely to focus on superficial details in both perceptual and inferential tasks (Carey & Diamond, 1977; Liben & Posnansky, 1977; Perner & Mansbridge, 1983; Brainerd & Reyna, 1993). Early teenagers are more focused on the details of cooperation, which means they are more concerned with the benefits of cooperation. Although power has an effect on the early teenagers' cooperation affection, the influence is limited. According to the Approach-Inhibition Theory, the BAS of the high-power teenagers is activated and has a higher cooperation affection. And aging can deepen this effect. Thus, high-power individuals of old teenagers could concentrate on the global situation and find that cooperation is good for the group according to the Fuzzy-trace theory. Secondly, the individual's sense of power perception is closely related to the individual's self-perception, independent decision-making, and independent achievement of goals. Ornstein (2021) indicates that the development of personal power is related to the two major developmentally crucial self-object experiences: merger with the idealized strength of the caretaker and feeling validated by the idealized other. Increasing age will promote the development of an individual's sense of power, thereby further promoting the relationship between power and decision-making. cooperation affection is formed in decision-making, thus further promoting the relationship between sense of power and cooperation affection. Thus, old teenagers are more sensitive to the influence of power on cooperation affection than that of younger teenagers. Finally, teenager is also a critical period of self-identification. The early teenagers are just beginning to be clear about the task of self-development, while the old teenager period (university) is almost the time that teenagers complete the task of self-identification, that is, self-identity is formed (Waterman, 1982). At the same time, studies have shown that teenagers' cognitive abilities about social issues (e.g., morality, collective equity, and cooperation) are not fully developed compared to adults (Gutierrez- R oig *et al*., 2014). As a result, the impact of sense of power on the cooperation affection of early teenagers is not as pronounced as that of old teenagers.

5. Conclusion

Through this study, we can draw the following conclusions: (1) with the increase of age, adolescents' cooperation affection shows a downward trend; (2) the sense of power promotes the cooperation affection among adolescents; (3) Age can regulate the role of the sense of power in the cooperation affection of adolescents.

5. Research Limitations

This study primarily focuses on adolescents in Huizhou, China as the sample group. Therefore, the results may only be generalizable to some Chinese adolescents. Future research should involve a larger and more diverse sample of adolescents using random sampling to select research objects across China.

Funding Statement: This research was supported by the Guangdong Province Philosophy and Social Science Youth Project (Grant No. GD24YjY11), the Young Innovation Talent Project of Guangdong Province (Grant No. 2023WQNCX070), the Huizhou City Philosophy and Social Sciences Project (Grant No. HZ2023GJ139).

Ethics Approval: Before collecting data, informed consent was obtained from the students' (under 18 year-old) parents. The principles of voluntary participation and confidentiality of the responses were emphasized. The study design was approved by Huizhou University ethics review board.

Conflicts of Interest: The authors declare that they have no conflicts of interest to report regarding the present study.

References

Avrahami, J., Kareev, Y., Todd, P. M., & Silverman, B. (2014). Allocation of resources in asymmetric competitions: how do the weak maintain a chance of winning?. *Journal of Economic Psychology*, 42(2), 161-174.

Brainerd, C. J., & Reyna, V. F. (1993). Domains of fuzzy-trace theory. In *Emerging Themes in Cognitive Development: Volume I: Foundations* (pp. 50-93). New York, NY: Springer New York.

Brainerd, C. J., Reyna, V. F., & Zember, E. (2011). Theoretical and forensic implications of developmental studies of the DRM illusion. Memory and Cognition, 39, 365–380. https://doi.org/10.3758/s13421-010-0043-2

Carey, S., & Diamond, R. (1977). From piecemeal to configurational representation of faces. Science, 195(4275), 312-314.

Chen, S., Langner, C. A., & Mendozadenton, R. (2009). When Dispositional and Role Power Fit: Implications for Self-Expression and Self-Other Congruence. Journal of Personality & Social Psychology, 96, 710-727. https://doi.org/10.1037/a0014526

De Cremer, D., & Tyler, T. R. (2007). The effects of trust in authority and procedural fairness on cooperation. J Appl Psychol, 92(3), 639-649.

Fiebich, A. (2019). Social Cognition, Empathy and Agent-Specificities in Cooperation. Topoi, 38, 163–172. https://doi.org/10.1007/s11245-017-9480-x

Gutierrez-Roig, M., Gracia-Lazaro, C., Perello, J., Moreno, Y., & Sanchez, A. (2014). Transition from reciprocal cooperation to persistent behaviour in social dilemmas at the end of adolescence. *Nat Commun*, 5,4362. https://doi.org/10.1038/ncomms5362.

Hammar Chiriac, E. (2014). Group work as an incentive for learning–students' experiences of group work. *Frontiers in psychology*, 5, 558. https://doi.org/10.3389/fpsyg.2014.00558

Harms, P. D., Roberts, B. W., & Wood, D. (2007). Who Shall Lead? An Integrative Personality Approach to the Study of the Antecedents of Status in Informal Social Organizations. *Journal of Research in Personality*, 41, 689-699. https://doi.org/10.1016/j.jrp.2006.08.001

Jackson, L. A., Zhao, Y., Qiu, W., et al. (2008). Cultural difference in morality in the real and virtual worlds: A comparison of Chinese and U.S. youth. *Cyber Psychol Behav, 11*(3), 279-286. https://doi.org/10.1089/cpb.2007.0098

Kimbrough, E. O., Sheremeta, R. M., & Shields, T. W. (2014). When parity promotes peace: resolving conflict between asymmetric agents. *Journal of Economic Behavior & Organization*, *99*(1), 96-108.

Lee, S. (2011, July). Different gender-based roles on cooperation: Integrating differentiated leader member exchanges, communication, and trust in hotel organizations. Paper presented at the meeting of International CHRIE Conference, Denver, Colorado USA.

Lingyan, G., & Dianli, Y. (2021). Research on the Influence of Taekwondo on Teenagers' Psychological Quality. *Journal of Frontiers in Educational Research*, *1*(5), 106-8. https://doi.org/10.23977/aetp.2021.58001

Liben, L. S., & Posnansky, C. J. (1977). Inferences on inference: The effects of age, transitive ability, memory load, and lexical factors. *Child Development*, 1490-1497.

Liu, C., Wei, Q., Zhuang, X., Wang, J. & Fan, T. (2014). The Effect of Power on Cognition: Heuristic or Analytic? *Journal of Psychological Science*, *37*(2) ,446－453. http://bit.ly/3CSJieE

Lu, J. M. (2009a). On Adolescent Affective Quality. Educational Research, 10, 30-35.

Lu, J. M., et al. (2009b). An investigation of the Status quo of China's Contemporary Youth's. Affective Quality. *Acta Psychologica Sinica*, *41*(12), 1152−1164. https://bit.ly/3NM9C0w

Lu, Y., Zhang, L., & Xu, B. (2016). The Effect on Cooperative Behaviors by Cooperation Index and Social Distance. *Psychological Science, 39*(2), 435–440. http://bit.ly/42WNWTD

Miller, P. H., & Bjorklund, D. F. (1998). Contemplating fuzzy-trace theory: The gist of it. *Journal of Experimental Child Psychology, 71*(2), 184–193. https://doi.org/10.1006/jecp.1998.2471

Ornstein, A. (2021). A developmental perspective on the sense of power, self-esteem, and destructive aggression. In The Annual of Psychoanalysis (pp. 145-154). Routledge. https://doi.org/10.4324/9780203779118

Perner, J., & Mansbridge, D. G. (1983). Developmental differences in encoding length series. *Child development*, 710-719.

Peterson, S. E., & Miller, J. A. (2004). Comparing the quality of students' experiences during cooperative learning and large-group instruction. *The Journal of Educational Research, 97*(3), 123-134.

Reyna, V. F., & Kiernan, B. (1994). The development of gist versus verbatim memory in sentence recognition: Effects of lexical familiarity, semantic content, encoding instruction, and retention interval. *Developmental Psychology*, 30, 178–191. https://doi.org/10.1037/0012-1649.30.2.178

Reyna, V. F., & Kiernan, B. (1995). Children's memory and metaphorical interpretation. *Metaphor and Symbolic Activity*, 10, 309–331. https://doi.org/10.1207/s15327868ms1004_5

Rivers, S. E., Reyna, V. F., & Mills, B. (2008). Risk taking under the influence: A fuzzy-trace theory of emotion in adolescence. *Developmental Review*, 28(1), 107-144. https://doi.org/10.1016/j.dr.2007.11.002

Ruegera, S. Y., Maleckia, C. K., & Demaraya, M. K. (2008). Gender difference in the relationship between perceived social support and student adjustment during early adolescence. *School Psychology Quarterly, 23*, 496-514. https://doi.org/10.1037/1045-3830.23.4.496

Sandu, C. M., Pânişoarã, G., & Pânişoarã, I. O. (2015). Study on the development of self-awareness in teenagers. *Procedia-Social and Behavioral Sciences*, 180, 1656-1660. https://doi.org/10.1016/j.sbspro.2015.05.060

Szathmáry, E. (2011). To group or not to group. *Science*, 334, 1648–1649.

Bickerton, D., & Szathmáry, E. (2011). Confrontational scavenging as a possible source for language and cooperation. *BMC Evolutionary Biology*, 11, 261.

Sun, H. (2012). *The empirical study on the current situation, influence factors and cultivation of teenagers' cooperation affection* [Master dissertation, Shanghai Normal University in China].

Van Dijk, E., & Wilke, H. (1995). Coordination rules in asymmetric social dilemmas: a comparison between public good dilemmas and resource dilemmas. *Journal of Experimental Social Psychology*, 31(1), 1-27.

Volet, S., & Mansfield, C. (2006). Group work at university: Significance of personal goals in the regulation strategies of students with positive and negative appraisals. *Higher Education Research & Development*, 25(4), 341-356. https://doi.org/10.1080/07294360600947301

Wang, J. Z. (2018). The causes and solution of power worship. *Leadership Science*, (25),45-47. https://doi.org/10.19572/j.cnki.ldkx.2018.25.014

Waterman, A. S. (1982). Identity development from adolescence to adulthood: An extension of theory and a review of research. *Developmental psychology*, 18(3), 341.

Zheng, T. J. (2022). *An empirical study on group learning effect o of university students' specialized courses--Take X University as an example* [Master dissertation, Northwest University for Nationalities in China].

Zhou, H., & Long, L. Y. (2004). Statistical Remedies for Common Method Biases. *Advances in Psychological Science*, 12(6), 942-950. https://bit.ly/3NOUAqM