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ORIGINAL RESEARCH

How Self-Other Overlap Shapes Online Altruism in Adolescents: The Role of Empathy and Moral Identity

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Purpose: Although adolescent online behavior has become a research hotspot in recent years, most studies focus on the risks in online life, lacking research on positive phenomena online and even more so on the exploration of their internal mechanisms. This study explores the relationship between self-other overlap, empathy, moral identity, and adolescent online altruistic behavior, and discusses whether empathy and moral identity play a serial mediating role between self-other overlap and adolescent online altruistic behavior.

Patients and Methods: This study conducted a questionnaire survey on 392 adolescents. Descriptive analysis and correlation analysis were performed using SPSS 23.0, and model construction and bias-adjusted bootstrap mediation effect testing were conducted using Mplus 8.3.

Results: There were significant positive correlations between self-other overlap, empathy, moral identity and internet altruistic behavior ($r=0.168\sim0.412$, all $p<0.01$). Self-other overlap can directly predict internet altruistic behavior, and can also indirectly predict internet altruistic behavior through chain mediating effects of empathy and moral identity.

Conclusion: This study has discovered the internal mechanism by which self-other overlap affects online altruistic behavior, demonstrating that empathy and moral identity play a chain mediating role in this process. This finding can guide people to view the impact of network development more dialectically, calling for a focus on how to leverage the positive effects of the internet rather than simply blaming its negative impacts. It also provides new theoretical basis for guiding adolescents on how to use the internet healthily, contributing to the construction of a more harmonious online environment.

Keywords: self-other overlap, internet altruistic behavior, empathy, moral identity, adolescents

Introduction

In the present day, the psychological and behavioral aspects of adolescents in their online lives have become a research hotspot.[1] Researchers have increasingly focused on the risks associated with the use of social media. However, they have overlooked the fact that social networks serve as a space for prosocial and social support behaviors among adolescents.[2] It is evident that this research trend may lead to a one-sided and negative impression of the internet. Moreover, discussions aimed at preventing negative internet use are not conducive to directly guiding positive online behaviors.[3] Based on this, this study directly focuses on the altruistic behavior of adolescents in the network and its influencing factors, in hopes of providing a positive perspective and understanding for a more comprehensive understanding of adolescent behavior in the online space, and providing a theoretical basis for guiding adolescents to use the internet correctly. Online altruistic behavior is defined as voluntary helping behavior that is beneficial to others and society and not aimed at personal gain, demonstrated by individuals in the virtual environment of the Internet.[4] The convenience, anonymity, immediacy, and interactivity of the online space make online altruistic behavior even more common than in real life.[5] Therefore, guiding online altruistic behavior is undoubtedly an important field that cannot be ignored in

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cultivating the good qualities of adolescents. Past research has also confirmed that there is a relatively widespread online altruistic behavior among adolescents, which has an important contribution to creating a good online atmosphere.[4]

Adolescents' online altruistic behavior is conducive to the formation of positive psychological qualities and the enhancement of subjective well-being.[6] It also helps to cultivate good social relationships.[7] In the online space, if more and more people exhibit such behavior, it may establish a positive online interaction social norm.[8] Moreover, the direct impact of online altruistic behavior - such as online social support - is related to the improvement of self-identity and life satisfaction, and the reduction of loneliness and social anxiety.[9] In summary, exploring the online altruistic behavior of adolescents and its influencing factors is of great significance for creating a healthy and civilized online atmosphere and promoting the social adaptation of adolescents.[10]

Self-Other Overlap and Adolescents' Online Altruistic Behavior

Self-other overlap refers to the cognitive phenomenon where individuals, in interpersonal relationships, accept and understand others' concepts, resources, and characteristics to varying degrees, resulting in an overlap of self and other information representations.[11] Various studies have indicated that self-other overlap can positively predict the occurrence of altruistic behavior. For example, individuals are more inclined to help others who are similar in attire, gender, or race.[12] There is also research showing that individuals generally prefer to help their family members or friends rather than strangers.[13] Myers found that the higher the degree of self-other overlap, the stronger the emotional identification individuals feel, and the more altruistic behavior they exhibit.[14]

Furthermore, the online space has brought people closer in social interactions. In-depth communication in the online space allows internet users who are geographically dispersed to form temporary groups or reference groups, thereby generating a sense of identity and belonging.[15] This proves that self-other overlap still exists in the online space. Moreover, due to the anonymity of the internet, helpers are not constrained by the gaze of others, the "diffusion of responsibility" phenomenon is suppressed, and the obstacles of the bystander effect can be disregarded. As a result, the likelihood of netizens providing help to others is higher.[16] Existing research has shown that adolescents' online altruistic behavior is related to the homogeneity displayed by the recipients of help. Altruistic behavior is more likely to occur between people with similar characteristics in the online environment, indicating that self-other overlap is crucial for the potential occurrence of online altruistic behavior in individuals.

The Chain Mediating Role of Empathy and Moral Identity

Most researchers advocate for a division of empathy into cognitive and affective components, considering empathy to be an individual's ability to identify others' psychological states and experience emotional reactions through imagination or observation of others' situations or emotional feelings.[17] Due to the unique interactivity, immediacy, and connectivity of the internet, empathy can fully function on online platforms, making the internet a space where empathic experiences frequently occur. In the online environment, a strong state of empathy stimulates altruistic motives, guiding adolescents to still demonstrate the fine quality of helping others, using their existing abilities and resources to help those in need.[4] Previous studies have shown that empathy has a significant positive predictive function for online altruistic behavior, with higher levels of empathy correlating with higher degrees of online altruistic behavior.[18] Myers et al found that self-other overlap scores can significantly predict an individual's understanding of others' emotional states, and the higher the overlap, the more accurate the understanding.[19] This suggests that the degree of self-other overlap may affect the frequency of online altruistic behavior by influencing the level of empathy.

It is worth noting that research on moral identity shows that moral identity can also positively predict altruistic behavior. Specifically, students with higher levels of moral identity are more willing to help others.[20] Moral identity, also referred to as moral self-identity or moral identity, is generally seen as an important psychological mechanism for the transformation of moral principles and thoughts into real actions. The social cognitive model defines moral identity as a self-schema organized around a set of moral-related traits, which is formed and developed through interactions with others during an individual's growth, and is not immutable.[21] Based on this, we speculate that individuals with a higher degree of self-other overlap are more likely to generate empathy, that is, to understand others' emotions, psychology, and behavior, and thus are more likely to activate moral identity in moral situations and carry out moral actions. Moreover,

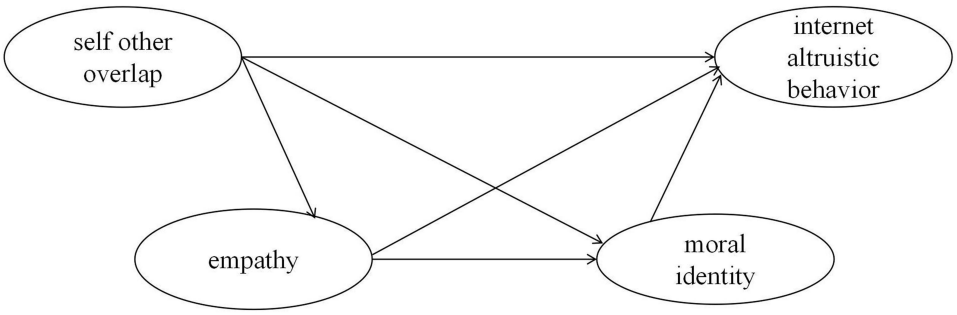

Figure 1 The theoretical model of this study.

existing research has proven in the group of medical students that empathy can positively affect online altruistic behavior through moral identity, and moral identity plays a partial mediating role between empathy and online altruistic behavior.[22]

Aims and Hypothesis

In summary, this study focuses on the adolescent population and uses empathy and moral identity as mediating variables to attempt to construct a chain mediation model. It explores the internal mechanism by which self-other overlap affects online altruistic behavior, aiming to provide a new theoretical basis for guiding adolescents to use the internet in a healthy and positive manner. Based on the background of previous research, we propose the following hypotheses and initially construct the hypothetical model, as shown in Figure 1.

H1: Self-other overlap can positively predict adolescents' online altruistic behavior.

H2: Empathy mediates the relationship between self-other overlap and adolescents' online altruistic behavior. That is, the higher the degree of self-other overlap, the stronger the empathy, leading to more online altruistic behavior among adolescents.

H3: Moral identity mediates the relationship between self-other overlap and adolescents' online altruistic behavior. That is, the higher the degree of self-other overlap, the higher the level of moral identity, leading to more online altruistic behavior among adolescents.

H4: Self-other overlap can positively predict online altruistic behavior through the chain mediating role of empathy and moral identity.

Methods

Participants

From February to April 2024, a survey was conducted involving 419 junior high school students. After excluding invalid questionnaires with missing responses and those with regular patterned answers, 392 valid questionnaires were collected, with a valid recovery rate of 93.56%. Among them, there were 197 male students (50.2%) and 195 female students (49.8%), with an average age of the participants being 12.1 years old (with a standard deviation of 1.6 years).

Measures

Self-Other Overlap

The Inclusion of Other in the Self Scale (IOS) is used to measure the degree of cognitive representation overlap between the subject's personality traits and those of others.[23] The scale consists of one item featuring seven pairs of circles that gradually progress from no overlap to complete overlap. Subjects are instructed to choose a pair of circles that best represents their relationship with others from 1 to 7, with higher scores indicating a greater degree of self-other overlap. Although this scale is a single-item scale, its validity has been confirmed in previous studies. Additionally, it is currently

the most commonly used scale for directly measuring self-other overlap, and its image-based presentation is also more conducive to understanding by the adolescent participants in this study.[24]

Internet Altruistic Behavior

The Adolescent Internet Altruistic Behavior Scale[4] (Internet Altruistic Behavior Scale, IABS) consists of 26 items, including four dimensions: Internet sharing (6 items), Internet support (9 items), Internet warning (5 items), and Internet guidance (6 items). The scale uses a 4-point scoring system (1=Never, 4=Always), with higher scores indicating a higher frequency of the subject's online altruistic behavior in life. In this study, the total scale and each dimension's Cronbach's α coefficients are 0.89, 0.93, 0.90, and 0.91, respectively. Although the scale was initially designed for college students, the creators attempted to administer it to a middle school student population and found that the scale still has high reliability and validity.[25] The Cronbach's α coefficient for this study was 0.98, indicating good internal consistency.

Empathy

The revised Chinese version of the Positive and Negative Affect Empathy Scale (PaNES)[26,27] is used to measure the subject's level of empathy. The scale consists of 14 items, including two dimensions: positive empathy (7 items) and negative empathy (7 items), with Cronbach's α coefficients of 0.86 and 0.87 for each dimension, respectively. The scale uses a 5-point scoring system (1=Very Inconsistent, 5=Very Consistent), with higher scores indicating a higher level of empathy in that dimension.The Cronbach's α coefficient for this study was 0.92.

Moral Identity

The Adolescent Moral Identity Questionnaire[28] is the Chinese revised version of Aquino and Reed's Moral Identity Scale,[21] consisting of 16 items, including two dimensions: implicit (9 items) and explicit (7 items), with Cronbach's α coefficients of 0.87 and 0.86 for each dimension, respectively. The measurement procedure for this scale is as follows: First, ten representative moral trait words are presented to the subjects (trustworthy, filial, honest, responsible, generous, polite, sincere, helpful, kind, upright, loyal); then the subjects are asked to imagine a person with the above-mentioned qualities and answer the questions based on their feelings when imagining this person. The scale uses a 5-point scoring system (1=Completely Disagree, 5=Completely Agree), with higher scores indicating a higher level of moral identity in the subject.The Cronbach's α coefficient for this study was 0.92.

Statistical Analysis

Descriptive statistics and correlation analysis were conducted using SPSS 23.0; the chain mediation model was constructed using Mplus 8.3 software for model fit testing and path analysis. The bias-adjusted bootstrap method was employed to draw 5000 samples to estimate the 95% confidence intervals for each effect, and mediation effect testing was performed. A difference was considered statistically significant at $p < 0.05$.

Results

Common Method Bias Test

The Harman single-factor test was used to examine common method bias. The unrotated exploratory factor analysis resulted in the extraction of seven factors with an eigenvalue greater than 1. The maximum variance explained by a single factor was 34.35%, which is less than the critical standard of 40%. Therefore, there is no severe common method bias in this study.

Descriptive Statistics and Correlation Analysis

The results of the correlation analysis indicate that online altruistic behavior [mean (SD) = 55.06 (20.61)] is significantly positively correlated with self-other overlap [mean (SD) = 2.47 (1.90)], empathy [mean (SD) = 46.73 (11.42)], and moral identity [mean (SD) = 64.83 (12.26)] (all $p < 0.01$). Additionally, the correlation analysis results show that age is significantly positively correlated with online altruistic behavior ($r = 0.168$, $p < 0.01$). See Table 1.

Table 1 Descriptive Statistics and Correlations of the Main Variables

	M	*SD*	1	2	3	4	5
1.Age	12.050	1.642	1				
2.Self other overlap	2.470	1.901	0.017	1			
3.Empathy	46.730	10.549	0.044	0.186**	1		
4.Moral identity	65.117	11.422	0.052	−0.012	0.375**	1	
5.Internet altruistic behavior	55.061	20.609	0.168**	0.294**	0.412**	0.305**	1

Notes: N=392.**p<0.01.
Abbreviations: M, mean; SD, standard deviation.

Structural Equation Modeling

Structural Equation Modeling was conducted using Mplus 8.3 to analyze the relationships among self-other overlap, empathy, moral identity, and online altruistic behavior, After controlling for the covariate of age, The model fit indices were as follows: $\chi 2/df = 2.67$, CFI = 0.982, TLI = 0.973, SRMR = 0.032, RMSEA = 0.065 (95% CI: 0.048~0.083), indicating a good model fit. The relationships among the variables in the model are depicted in Figure 2, with all solid line path coefficients being significant (all $p < 0.05$). The results show that self-other overlap can directly and positively predict online altruistic behavior, supporting H1, and can also indirectly and positively predict online altruistic behavior through empathy, supporting H2. Additionally, self-other overlap indirectly and positively predicts online altruistic behavior through the serial mediation of empathy and moral identity, supporting H4.See Figure 2.

Mediation Effect Test

Using the bias-adjusted bootstrap method with 5000 resamples to test the mediation effect, the results indicate that the 95% confidence intervals for both paths do not include 0, and the mediation effects are significant. Empathy plays a partial mediating role between self-other overlap and online altruistic behavior, with an effect size of 0.060; the serial mediating role of empathy and moral identity between self-other overlap and online altruistic behavior has an effect size of 0.020. See Table 2.

Discussion

The Correlation Between Self-Other Overlap and Adolescents' Online Altruistic Behavior

The results of the study indicate that adolescents' self-other overlap, empathy, and moral identity can jointly have a positive impact on online altruistic behavior. This finding sheds light on the internal mechanisms affecting adolescents' online altruistic behavior, suggesting that self-other overlap may be an important factor in enhancing such behavior. It enriches the theoretical model and provides a reference for guiding adolescents' online altruistic behavior.

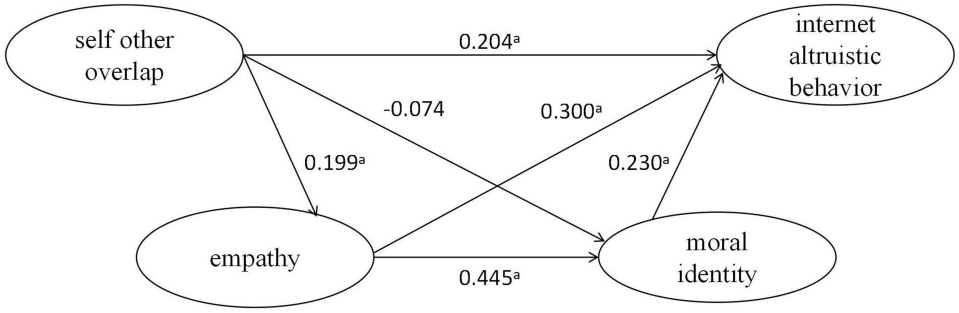

Figure 2 Relationship model diagram based on variable centered analysis.
Note: [a] p<0.001.

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Table 2 Mediation Effect

Effect	Path	Estimate	*SE*	95% CI	
				LL	UL
Total effect		0.267	0.041	0.704	1.323
Direct effect	Self other overlap→internet altruistic behavior	0.204	0.033	0.546	1.043
Indirect effect	Self other overlap→empathy→internet altruistic behavior	0.060	0.019	0.099	0.397
	Self other overlap→moral identity→internet altruistic behavior	−0.017	0.013	−0.186	0.016
	Self other overlap→empathy→moral identity→internet altruistic behavior	0.020	0.007	0.546	1.043

Abbreviations: SE, Standard Error; CI, confidence interval; LL, lower interval; UL, upper interval.

The results show that self-other overlap is closely related to adolescents' online altruistic behavior. The higher the degree of self-other overlap, the more frequently individuals engage in online altruistic behavior, which is similar to previous studies showing that self-other overlap positively predicts altruistic behavior.[16,29,30] This result is supported by the self-expansion model. The self-expansion model posits that self-other overlap is an internal mechanism for promoting friendly behavior and reducing harmful actions.[31] The higher the degree of self-other overlap, the more individuals feel that "helping others is like helping oneself, and hurting others is like hurting oneself." This feeling increases the likelihood of friendly behavior towards others. The higher the degree of self-other overlap with the target, the more attention is paid to the interests of others.[31] Consequently, they are more likely to consider the interests of others in moral decision-making because they regard the interests of others as part of themselves. This moral decision-making pattern makes them more inclined to perform altruistic behavior to meet the needs and interests of others.

The Chain Mediating Role of Empathy and Moral Identity

The study found that empathy plays a partial mediating role between self-other overlap and online altruistic behavior. The results show that the higher the degree of self-other overlap with the target, the more easily individuals empathize, consistent with previous research findings.[32–35] This result can be explained by the theory of mind, which posits that the prerequisite for empathy is cognitive ability. Moreover, the theory of mind emphasizes that the combination of brain regions activated during cognition represents the ability to understand and perceive others' mental states. Therefore, the higher the degree of self-other overlap, the stronger the ability to understand others, satisfying the prerequisite conditions for empathy, making it more likely to arise.[36] Empirical research has shown that empathy has a significant positive predictive effect on online altruistic behavior; the higher the level of empathy, the greater the degree of online altruistic behavior.[22] Batson's empathy-altruism hypothesis also applies in the online environment. In the virtual online environment, when individuals put themselves in others' positions to experience their needs and sufferings, they can empathize and help others, thus producing online altruistic behavior.[18]

The study also found that self-other overlap not only directly and positively predicts online altruistic behavior but also indirectly affects adolescents' online altruistic behavior through empathy and moral identity. The higher the degree of self-other overlap, the stronger the ability to understand others, representing a greater likelihood of empathy. Empathy can affect an individual's level of moral identity, thereby influencing adolescents' online altruistic behavior. Previous studies have shown that empathy can activate internal moral identity patterns, prompting individuals to act consistently with their moral identity.[37] The moral identity theory provides a valuable theoretical framework for explaining this result. Moral identity theory posits that moral identity arises from the psychological need for consistency between an individual's moral beliefs and behaviors. Individuals tend to seek and engage in behaviors that maximize cognitive balance or consistency, meaning that their moral identity should be consistent with their moral behavior; otherwise, a sense of inconsistency will arise. In other words, individuals will engage in moral behaviors that match their level of moral identity, demonstrating a tendency to pursue their own identity.[38] Moral identity plays an important regulatory role in maintaining an individual's moral image. Individuals adjust their moral behavior by comparing their current moral image with their ideal moral image. Therefore, individuals with high moral identity are more likely to act from the perspective of their ideal moral image, exhibiting more altruistic behavior in their interactions with the outside world to

maintain high moral standards. When the situation occurs in the online environment, individuals will exhibit more online altruistic behavior. Thus, empathy and moral identity play a serial mediating role in the pathway by which adolescents' self-other overlap affects online altruistic behavior.

Practical Implications

Based on the above analysis, this study posits that self-other overlap is a significant factor influencing adolescents' online altruistic behavior. Therefore, enhancing adolescents' self-other overlap in cyberspace is an effective way to increase the frequency of online altruistic behavior, which can be achieved by fostering their identification and sense of belonging to online social circles. This requires active guidance from online community builders. On one hand, society must focus on developing communication tools within online communities during network construction, providing a platform for self-disclosure and communication among network members, as well as channels for information exchange and knowledge sharing. On the other hand, while pursuing the breadth of topics involved in online communities, it is important to pay attention to the detailed categorization of different topics, creating a sense of small-circle atmosphere so that adolescents can gain a sense of identification and belonging from areas they are interested in.

Furthermore, this paper also focuses on exploring the internal mechanisms of this influence process, confirming the chain mediating role of empathy and moral identity. This suggests that teachers and parents should pay attention to the moral cultivation of adolescents. On one hand, empathy training can be integrated into students' moral education to promote the transmission of altruistic behavior and to facilitate the high-quality and efficient implementation of moral education, which is a central aspect of education. On the other hand, teachers responsible for online courses should emphasize the moral requirements and principles of using the internet, while also providing positive guidance for online altruistic behavior.

Research Deficiencies and Prospects

Firstly, in the measurement of self-other overlap, this study employed a single-item scale. Although previous research has demonstrated that this scale has good representativeness and reliability, it also suggests that future researchers should explore whether there are more comprehensive measurement tools to obtain more accurate results. This provides a new direction for future research.

Secondly, future research should pay attention to the consideration of the time frame. In addition to the relationships among the four variables primarily discussed in this study, the correlation analysis between online altruistic behavior and age also indicates that as age increases, the frequency of adolescents' online altruistic behavior tends to rise. This is similar to the results of previous longitudinal studies that found an upward trend in adolescents' online altruistic behavior.[22] Previous studies have shown that the emergence of altruistic motivation can be traced back to the preschool period.[39] In promoting online altruistic behavior, the motivation for online altruism is particularly important.[40] As they enter the later stages of adolescence, with improvements in perspective-taking and cognitive development, adolescents become more capable of considering others' thoughts, intentions, and feelings, which helps to express more prosocial behaviors.[41,42] However, some studies have indicated that prosocial behavior during adolescence may decrease with age.[43]

Although many studies have focused on age differences in adolescent prosocial behavior, there is still a lack of research, both domestically and internationally, on adolescents' online altruistic behavior in the context of virtual online space.[44,45] Existing studies have yielded inconsistent results due to different sample characteristics and research tools.

This study employed a cross-sectional research design. Although cross-sectional studies based on theoretical foundations can provide valuable information, since online altruistic behavior may evolve over time, future research could consider using experimental designs and longitudinal studies to further explore the developmental characteristics of this behavior related to age.

Conclusions

This study, based on certain theoretical and empirical research foundations, explores the relationships among self-other overlap, empathy, moral identity, and adolescent online altruistic behavior. It enriches the theoretical model of adolescent

online altruistic behavior to some extent and provides insights for guiding such behavior. Adolescents are the main body of cyberculture construction; their activities on the internet not only affect their own values and behavioral patterns but also have a broad and profound impact on society. Therefore, valuing the positive role of adolescents in the network is not only conducive to promoting their comprehensive development but also contributes to building a healthier and more harmonious online environment, thereby advancing societal progress.

The results of this study suggest that during the growth of adolescents, attention can be paid to cultivating their inclusiveness, empathy, and sense of moral identity, thereby increasing the frequency of adolescent online altruistic behavior. This also means that network builders and educators need to jointly focus on the roles that adolescents play online. They should not only create online spaces that facilitate the implementation of altruistic behaviors for young people, but also ensure that teachers and parents take on the responsibility of strengthening moral education for students in offline environments. Recent domestic and international research has shown that with the development of adolescents, there is a trend of decline in their emotional ability scores, which implies that in today's internet era, the older they are, the worse their emotional abilities become.[46] We can use online altruistic behavior to establish and cultivate the correct values of adolescents, preventing them from becoming indifferent and ruthless egoists.

For adolescents themselves, advocating for good online practices is beneficial for developing good social habits, which has a positive significance for the development of their future social relationships.[47] At the same time, online altruistic behavior provides adolescents with a window to become familiar with and comply with online and even social norms. The online world is different from reality but interconnected, allowing adolescents to first experience "the gentleman has principles for action and inaction" in the online world and then practice it in reality, which is conducive to the formation of a good social atmosphere.

Finally, in the rapidly developing era of the internet, the large proportion of adolescent users in the online community should not be underestimated, and the power of young netizens should not be overlooked. How to actively guide the adolescent group to benefit from the internet and give back to society requires the joint attention of the entire society.

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethics Approval

The study was conducted after the Declaration of Helsinki and was approved by the North China University of Science and Technology Medical Ethics Review Committe (ID number:2024228). All legal guardians of the participants voluntarily provided written informed consent before participation in the study. Participation was voluntary, and all data were handled confidentially.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors report no conflicts of interest in this work.

References

1. Komninos A. Pro-social behaviour in crowdsourcing systems: experiences from a field deployment for beach monitoring. *Inter J Human Comp Stud*. 2019;124:93–115. doi:10.1016/j.ijhcs.2018.12.001

2. Lysenstoen C, Bøe T, J HG, et al. A review of the relationship between social media use and online prosocial behavior among adolescents. *Front Psychol*. 2021;12:579347. doi:10.3389/fpsyg.2021.579347
3. Amichai-Hamburger Y, Furnham A. The positive net.. *Computers Human Behav*. 2007;23(2):1033–1045. doi:10.1016/j.chb.2005.08.008
4. Zheng X, Chen H, Wang X, et al. Development trends of adolescents' internet altruistic behavior and the influence of social class:A longitudinal study. *Psychol Develop Educ*. 2023;39(3):333–341. doi:10.16187/j.cnki.issn1001-4918.2023.03.04
5. Jiang H, Chen G, Wang T. Relationship between belief in a just world and Internet altruistic behavior in a sample of Chinese undergraduates: multiple mediating roles of gratitude and self-esteem. *Pers Individ Dif*. 2017;493–498. doi:10.1016/j.paid.2016.09.005
6. Zeng P, Nie J, Y GJ, et al. Self-compassion and subjective well-being: a moderated mediation model of online prosocial behavior and gratitude. *Psychol Schools*. 2023;60(6):2041–2057. doi:10.1002/pits.22849
7. Malonda E, Llorca A, Mesurado B, et al. Parents or peers? Predictors of prosocial behavior and aggression: a longitudinal study. *Front Psych*. 2019;10:2379. doi:10.3389/fpsyg.2019.02379
8. Jang Y-J, Kim H-W, Jung Y. A mixed methods approach to the posting of benevolent comments online. *Int J Info Manag*. 2016;36(3):414–424. doi:10.1016/j.ijinfomgt.2016.02.001
9. Zhou Z, Cheng Q. Relationship between online social support and adolescents'mental health: a systematic review and meta-analysis. *J Adolescence*. 2022;94(3):281–292. doi:10.1002/jad.12031
10. Zhou Z, Cheng Q. The effect of social network use on internet altruistic behavior in adolescents:a moderated mediating model. *Chin J Clin Psychol*. 2021;29(4):824–828. doi:10.16128/j.cnki.1005-3611.2021.04.032
11. Aron A, Lewandowski JGW, Mashek D, et al. *The Self-Expansion Model of Motivation and Cognition in Close Relationships*. Oxford Handbooks Online; 2013.
12. Emswiller T, Deaux K, Similarity WJE. Sex, and requests for small favors 1. *J Appl Social Psychol*. 1971;1(3):284–291. doi:10.1111/j.15591816.1971.tb00367.x
13. Tesser A, Smith J. Some effects of task relevance and friendship on hel: you don't always help the one you like. *J Exp Soc Psychol*. 1980;16(6):582–590. doi:10.1016/0022-1031(80)90060-8
14. Myers MW, Laurent SM, Hodges SD. Perspective taking instructions and self-other overlap: different motives for helping. *Motiv Emot*. 2014;38(2):224–234. doi:10.1007/s11031-013-9377-y
15. Myers M W, Laurent S M, Hodges S D. Research on altruistic behavior in the network environment. *Mod Commun*. 2009;(3):27–35. doi:10.19997/j.cnki.xdcb.2009.03.010
16. Wang H, Wang Y, Nie J, et al. Family socioeconomic status and internet altruistic behavior among Chinese adolescents: the mediating effect of personal belief in a just world and emotional intelligence. *Child Youth Services Rev*. 2021;121:105841. doi:10.1016/j.childyouth.2020.105841
17. Wang H, Wang Y, Nie J, et al. Empathy deficits and sexual offending: a model of obstacles to empathy. *Aggression Violent Behav*. 2013;(2):228–239. doi:10.1016/j.avb.2012.11.010
18. Zheng XL, Zhao W. The relationships among empathy, self-efficacy and internet altruistic behavior. *Chin J Clin Psychol*. 2015;23(02):358–361. doi:10.16128/j.cnki.1005-3611.2015.02.039
19. Myers MW, Hodges SD. The structure of self–other overlap and its relationship to perspective taking. *Pers Relationships*. 2012;19(4):663–679. doi:10.1111/j.1475-6811.2011.01382.x
20. Aquino K, McFerran B, Laven M. Moral identity and the experience of moral elevation in response to acts of uncommon goodness. *J Personality Soc Psychol*. 2011;100(4):703–718. doi:10.1037/a0022540
21. Aquino K, Reed A. The self-importance of moral identity. *J Personality Soc Psychol*. 2002;83(6):1423–1440. doi:10.1037/0022-3514.83.6.1423
22. Jiang J, Zhao X, Li Y, et al. Relationship between empathy and Internet altruistic behavior of medical students:mediating role of moral identity. *J Bengbu Med College*. 2023;48(11):1584–1588. doi:10.13898/j.cnki.issn.1000-2200.2023.11.024
23. Aron A, Aron EN, Smollan D. Inclusion of other in the self scale and the structure of interpersonal closeness. *J Personality Soc Psychol*. 1992;4:596–612. doi:10.1037/0022-3514.63.4.596
24. Zi H, He J. Self-others overlap and related concepts. *Adv Psychol Sci*. 2019;27(7):1238–1247. doi:10.3724/SP.J.1042.2019.01238
25. Zi H, He J. A review of studies on internet altruistic behavior. *Elementary Secondary Schooling Abroad*. 2012;(4):19–23. doi:10.3969/j.issn.1007-8495.2012.04.004
26. Guo R, Wu Z, Zhang Y, et al. Revision of the Chinese version of positive and negative empathy scale and general empathy scale. *Chin J Clin Psychol*. 2022;30(2):324–330. doi:10.16128/j.cnki.1005-3611.2022.02.016
27. Andreychik MR, Migliaccio N. Empathizing with others'pain versus empathizing with others'joy: examining the separability of positive and negative empathy and their relation to different types of social behaviors and social emotions. *Basic Appl Social Psychol*. 2015;5:274–291. doi:10.1080/01973533.2015.1071256
28. Andreychik M R, Nicole M. The Psychological Development and Construction of Moral Identity. *Nanjing Normal Univ China*. 2008. doi:10.7666/d.y1331041
29. Wu Y, Zhang Y. The impact of perspective taking on obesity stereotypes: the dual mediating effects of self-other overlap and empathy. *Front Psychol*. 2021;643708. doi:10.3389/fpsyg.2021.643708
30. Xiaodan F, Binghai S, Chuansheng C, et al. Self-other overlap and interpersonal neural synchronization serially mediate the effect of behavioral synchronization on prosociality. *Soc Cognit Affective Neurosci*. 2020;15(2):203–214. doi:10.1093/scan/nsaa017
31. B CR, L BS, P LB, et al. Reinterpreting the empathy–altruism relationship: when one into one equals oneness. *J Personality So Psychol*. 1997;73(3):481–494. doi:10.1037/0022-3514.73.3.481
32. Aron A, N AE, Tudor M, et al. Close relationships as including other in the self. *J Personality So Psychol*. 1991;60(2):241–253. doi:10.1037/0022-3514.60.2.241
33. Lin S, Sun B, Huang J, et al. The effect of empathy on generalized reciprocity:the mediating effect of self-other overlap. *Psychol Dev Edu*. 2022;38(4):475–484. doi:10.16187/j.cnki.issn1001-4918.2022.04.03
34. Peng S, Zhang L, Hu P. Relating self-other overlap to ingroup bias in emotional mimicry. *Soc Neurosci*. 2021;4:439–447. doi:10.1080/17470919.2021.1940273
35. Zhou H, Gan Y, Yi L, et al. An event-related potentials study of self-other overlap affecting empathy for pain. *J Psychol Sci*. 2019;42(5):1194–1201. doi:10.16719/j.cnki.1671-6981.20190525

36. Arnett K, Roach A, Elzy M, et al. Childhood emotional invalidation and right hemispheric mu suppression during a pain empathy task: an EEG study. *Soc Neurosci*. 2019;14(2):236–250. doi:10.1080/17470919.2018.1441905
37. Arnett K, Roach A, Elzy M, et al. The influence of empathy on internet altruistic behavior among college students: the mediating role of moral identity. *Jilin Univ, China*. 2020. doi:10.27162/d.cnki.gjlin.2020.001663
38. Li P. Moral identity in business situations: a social-cognitive framework for understanding moral functioning.NARVAEZ D, LAPSLEY D. *Personality Identity Character PersonalityIdentity Character*. 2009;375–395. doi:10.1017/cbo9780511627125.018
39. Paulus M, Wörle M, Christner N. The emergence of human altruism:preschool children develop a norm for empathy-based comforting. *J Cognition Dev*. 2020;(No.1):104–124. doi:10.1080/15248372.2019.1693375
40. Zheng X, Zhu X, Zhou X, Xie F, Huang L. Internet altruistic motivation promotes internet altruistic behavior: a moderated mediation model. *Current Psych*. 2022;1–9. doi:10.1007/s12144-022-03918-x
41. Sassenrath C, Vorauer JD, Hodges SD. The link between perspective-taking and prosociality - Not as universal as you might think. *Current Opinion Psychol*. 2022;44:94–99. doi:10.1016/j.copsyc.2021.08.036
42. Meng X, Sedikides C, Luo YLL. The development of self-other overlap from childhood to adolescence. *PsyCh J*. 2022;11(6):968–970. doi:10.1002/pchj.600
43. Carlo GD, J CL, A RB, et al. A latent growth curve analysis of prosocial behavior among rural adolescents. *J Res Adolescence*. 2007;17 (2):301–324. doi:10.1111/j.1532-7795.2007.00524.x
44. Pastor Y, Torres VP, Currás HT, et al. A study of the influence of altruism, social responsibility, reciprocity, and the subjective norm on online prosocial behavior in adolescence. *Computers Human Behav*. 2024;154:108156. doi:10.1016/j.chb.2024.108156
45. Li W, Li W, Zhang M, et al. Internet altruistic behavior among Chinese early adolescents: exploring differences in gender and collective efficacy using a latent growth modeling. *Curr Psychol*. 2023:1–13. doi:10.1007/s12144-023-04660-8.
46. Shao Z, Liu Z, Yang S, et al. Open-mindedness: report on the study on social and emotional skills of Chinese adolescence (□). *J East China Normal Univ*. 2021;39(9):77–92. doi:10.16382/j.cnki.1000-5560.2021.09.005
47. Hirani S, Ojukwu E, Bandara NA. Understanding the role of prosocial behavior in youth mental health: findings from a scoping review. *Adolescents*. 2022;(28):358–380. doi:10.3390/adolescents2030028