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Research Paper

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Contribution Threat Perception, School Climate and Prejudice as Mediator to Student's Cyber Aggression

Mardianto Mardianto [1,2,*], Niken Hartati[1], Farah Aulia[1], Zulian Fikry[1], Rahayu Hardianti Utami[1,2] and Elrisfa Magistarina[1,2]

[1]Universitas Negeri Padang, Jl. Prof. Dr. Hamka Air Tawar Barat, Padang, Sumatera Barat, Padang 25131, Indonesia and [2]Cyber Psychology Intervention and Research Center, Universitas Negeri Padang, Jl. Prof. Dr. Hamka Air Tawar Barat, Padang, Sumatera Barat, Padang 25131, Indonesia

*Correspondence address. Department Psychology, Faculty of Psychology and Health, Universitas Negeri Padang, Jl. Prof. Dr. Hamka Air Tawar Barat, Padang, Sumatera Barat, Indonesia. Tel: +62 812 6672 6864; E-mail: mardiantopsi@fip.unp.ac.id

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Abstract

This study aims to test students' cyber aggression models based on previous studies, especially those related to high school students' Cyber Aggression behavior. Following the stages of adolescent development, this research uses the socio-ecological theoretical perspective of the cyber context. This study determines several predictive variables as risk factors and protective factors that have the most potential to influence student cyber aggression, such as perceived threats, school climate, and prejudice. The model tested in this study is the role of the perceived threat and school climate on students' Cyber Aggression behavior mediated by prejudice. This study uses a quantitative approach with structural equation modeling analysis, namely the structural equation model (SEM). The sampling technique used in this study is purposive sampling. The subjects of this study are high school students who actively use social media every day, with 1118 students as respondents from several cities in Indonesia. The result shows that the theoretical model of students' Cyber Aggression behavior as per the empirical conditions in the field has met the goodness of fit model standard, meaning that the perception of threats and the school climate-mediated by prejudice were simultaneously proven to play a role as predictors of student Cyber Aggression

Key words: cyber aggression, threat perception, school climate, prejudice

Introduction

The phenomenon of hate speech in Indonesia appears with the intensive use of social media in the community, and the escalation occurs massively at political moments such as Regional or National Elections. As in 2015, there were 671 reports that were submitted to the IT and cybercrime sub-directorate of the special economic crime directorate of the National Police Criminal Investigation Agency (Bareskrim Polri) related to hate speech, then in 2016 there were 199 cases, even 2017 it increased to 3325 cases [1, 2]. In 2019, as it was presidential election year, the National Police's Criminal Investigation Unit recorded 3429 cybercrime cases from January to August 2019, with the highest cases being cases of fraud and the spread of provocative content, which included negative political issues of ethnicity, religion, and racial (ERR) nuances [3].

The findings of several cases of cyber aggression (CA) also involve children and adolescents both as perpetrators and as victims, this is because their intensive and massive use of information technology [4–6]. Almost every time teenagers spend time accessing, interacting, and looking for information, on social media and other digital media. Furthermore, the developmental stages of adolescence often associated with aggressive behavior, i.e. relevant to hate speech behavior [7, 8]. The research of Maarif Institute team explained that fake news and ERR sentiments on social media influenced the mindset and atti-

tudes of younger generation, especially high school students, so that they became intolerant and discriminatory toward different groups [9].

Social media applies an algorithm that makes netizens polarized into exclusive groups in their respective information bubbles, called the filter bubble. Netizen is directed to something because the algorithm on their social media assumes that they favor and like certain things that are digitally recorded from their cyber activity, such as their comments, replies, likes, dislikes, follows, unfollows, and blocks [10]. Social media could form a double pattern of netizen interactions, namely bringing users closer together while also distancing and dividing users according to the characteristics of their group. This group polarization formed from partially received information they get while surfing in cyberspace.

Jablonska and Polkowski [11] explained that teenagers carry out CA, especially hate speech, caused by prejudice (PJ), focusing on themselves or their group because they feel mistreated, harmed both morally and materially feel wronged. In addition, the systems that regulate the flow of information on the internet, or social media algorithms, and characteristics of online communication also affect the occurrence of PJ between groups and discriminatory behavior against other groups [12].

Swearer and Espelage [13] found adolescents' aggressive behavior from a socio-structural perspective as behaviors develop along with their interaction with the social world. This statement is in line with Papatraianou [14], which proposed a conceptual framework based on ecological theory to analyze various contextual factors in understanding the risk factors and protective factors for juvenile CA behavior, both as perpetrators and victims.

Some contextual predictive factors such as social support, school climate (SC), and peer group norms have influenced CA behavior [15–17]. More specifically, Kowalski *et al.* [16] pointed to the social environment at the grade level in schools as a relevant predictor of hate speech emergence. This finding is supported by Vanderhoven *et al.* [18] who said that schools held a vital role in educating students to use social media safely. SC refers to the quality and character of students, which is based on the interaction of students, parents, and school, also how norms, goals, and values are applied in interpersonal relationships in learning practices and on organizational structures of an educational institution. A positive SC helps foster student attitudes necessary for a productive life and contributes to the welfare of life in a democratic society [19].

This study was designed to address the personal factors, namely the perception of threats and group PJ as risk factors for students' CA behavior [20]. The perception of threats in adolescents makes them easily prejudiced against individuals or groups. In addition, a non-personal variable added to this study is students' perceived SC to be a socio-ecological factor that affects the quality of relationships between individuals at school. In this study, the SC has been seen as another part of students' cyber context besides their family, peers, or local communities. Which at the same time reduces PJ between groups of individuals and is part of the protective factors of students' CA behavior [21]. In this study, the SC has seen as another part of student's cyber context besides their family, peers, or local communities.

1. The effect of threat perception (TP) on teen CA

   Many conflicts between individuals on social media originated from the negative attitudes toward other groups based on their in-group perception by individuals as representatives of the out-group. Adolescent who are discriminate from a group tend to experiences CA [5] The existence of the out group is perceived as a threat by individuals resulting negative emotions lead to aggressive behavior in cyberspace or called CA. Negative emotions and cognitions activation as form of response for the intergroup threats can trigger negative responses namely aggression and hate in cyberspace [8, 22, 23].

   Walters *et al.* [24] explained that there is some evidence in social psychology that shows that individual social behavior constantly influenced by perception that certain groups are considered as a threat to them. These threats divided into two forms, first, called a tangible threat, e.g. competing to get a job, to get decent housing, resources ownership, and any kind of physical harm to themselves or others. The second form called a symbolic threat, this related to threats to societal values and social norms. Furthermore, Nshom [25] explains that there is a positive relationship between PJ and realistic threats and between PJ and symbolic threats, but the negative relationship between PJ and negative stereotypes and this relationship remains relatively stable from early to late adolescence. In line with this, research by Charles-Toussaint and Crowson [26] revealed that the perception of symbolic and realistic threats and social dominance orientations were positive and significant predictors of student PJ, respectively.

   Often conflicts and disputes on social media are the result of negative attitudes toward individuals or communities who are considered to be representatives of their out group. Usually, the negative attitude is the result of internalizing the perspective of in-group individuals, where the presence or existence of the outside group is believed to be a threat, giving birth to negative emotions and leading to hate speech and other cyber-aggressive behavior [27]. Negative thoughts and emotions that are activated by threats between groups can produce negative responses to out-groups such as discrimination, hate speech, and other aggressive behavior [28].

2. The effect of PJ on teen CA

   Attacks on social media against certain individuals or groups are motivated by many factors, including socio-economic, political, and cultural PJs or PJs against certain ethnicities. According to Jubany and Roiha [29], PJ, i.e. a predictor of CA is PJ based on social inequality, where individuals believe the existence of foreigners or immigrants as a threat to the sustainability of their social security identity. Jolley *et al.* [30] stated that the exposure to an intergroup (in this case is Jewish People) conspiracy can lead to PJ toward the group. The findings were indirectly associate with increasing the number of PJs toward several numbers of secondary groups, i.e. Asians, Arabs, Americans, Irish, Australians, and so on).

   Research by Piumatti *et al.* [31], which examined the relationship between readiness for aggression and ethnic PJ in adolescents in Italy proved a positive relationship between readiness to behave aggressively due to the perceived social distance from the most rejected social group as a form of PJ against that group. This is in line with Soral *et al.* [32], which explored the effect of exposure to hate speech on outgroup PJ. Following the general aggression model, it was found that frequent and repeated exposure to hate speech leads to desensitization to forms of verbal violence such as CA on social media [33].

   Furthermore, Rost *et al.* [34], which explains the social norm theory approach to understanding CA in a socio-political online setting, according to which this flaming appears as a result of dislike, or the hostile nature of the public or other individuals toward the controversial behavior of the public figure. Similar

to the perception of threats, PJ also underlies individuals to act discriminatory and has the potential to attack unwelcome individuals and or groups.

In general, the behavior of haters on social media begins with the frequent exposure of netizens to content of radical thought, i.e. full of hatred and anti-social groups based on PJ, as well as negative perceptions of one group or government [35, 36].

3. The effect of SC on student CA

There is no single causal factor for teen aggressive and bullying behavior at school but rather there is an interaction between various contexts defined as socio-ecological where bullying and victimization occur both in offline and online communication [37–39]. According to Xu *et al*. [40], racial and ethnic minorities was susceptible to experiences contextual-level risk factors associated with bullying. Research by Casas *et al*. [17] and Kowalski *et al*. [16] showed that contextual predictive factors, such as social support, SC, or peer group norms, are common to both CA phenomena. The results of the study identified that the class norms, as indicated by the average attitude of classmates, were related to students' cyberbullying behavior. The perpetrators of CA generally do not appreciate the existence of norms regarding online behavior both at school and at home. A positive SC can increase student engagement with peers and reduce aggression in interactions between students [41]. Violence in the school environment gave strong influence on violence committed by students and teachers in schools [42]. Aldridge *et al*. [43] also found a statistically significant relationship between aspects of SC and students' self-reports of violence, bullying, and student delinquency including cyberbullying.

Hung *et al*. [44] explained that students' positive perceptions of the SC, such as for classroom order and the authoritative actions of teachers and school staff respectively, are uniquely inversely related to emotional problems and problematic behavior and peer victimization. This is because positive social contacts between individuals and groups are needed in reducing PJ and developing positive racial attitudes among groups of children and adolescents in schools that have students who are ethnically, culturally and religiously diverse [45]. In line with that Konold *et al*. [41] explained that a positive SC can increase student engagement with peers and reduce aggression in interactions among students.

Based on the explanation above, the research question is, do threat perceptions and SC mediated by PJ contribute to students' CA? And how much are these variables contribute in shaping students' CA?

H1: There is a significant contribution of TP to CA behavior among students.

H2: There is a significant contribution of SC to CA behavior among students.

H3: There is a significant contribution of TP to Adolescent CA through PJ.

H4: There is a significant contribution of SC to CA behavior through PJ.

Method

This research design is structured into an interaction model of factors that contribute to CA, both as risk factors and as protective factors for student CA. This can be illustrated in the dynamics of the influence of endogenous variables, namely TP, and SC of the exogenous variables of student CA by placing PJ as a mediator variable. The theoretical model was tested with structural equation modeling or SEM analysis, as shown on Fig. 1:

1. Procedure and participants

Data collection was web-based, used web-based self-report personality scales. Self-report was utilized to ensure single measure characteristic of the psychometric properties, such as item validation frequencies, score distribution, scale reliability, and factor structure.

The subjects of this research were respondents consisting of teenagers specifically high school students who have social media accounts. All subjects gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Health Research Ethics Committee, Universitas Negeri Padang, Sumatera Barat, Indonesia.

The initial number of respondents obtained was 1245 students, after the initially selected based on completion of scale filling, the total respondent reduced to 1118 students. Of the 1118 participants, there were 45.3% of male respondents and 54.7% were female. A total of 37.0% of respondents live in small cities, 35.2% in big cities, and 27.7% live in metropolitan cities. It can be concluded that most of the respondents are female and mostly are came from small cities. Based on ethnic group, the majority of respondents came from ethnics in Java and Sumatera, namely 31.2% are Minangkabau, 49.0% are Javanese, 14.1% are Sundanese, 3.9% are Betawi, 2.3% are Malay, 1.4% are Batak, and 1.6% are Chinese, and others. It can be said that almost half of teenagers participated in this study are Javanese.

2. Measures

2.1. TP is a condition when individuals perceive a situation as negative and feel the need to protect themselves. TP can be measured from the subject's response to Threat Perception Scale (TPS) with $=$ 0.815, which is modified from the Out-Group Threat Perception Scale (OTPS) by [38] based on two basic types of threats perceived by individuals, namely, (1) tangible threats, which refers to concerns about the real dangers of the presence of other individuals or groups that cause individuals to feel they will lose power and/or resources as well as threats to their general well-being. (2) Symbolic threats, which refer to concerns to the dangers of the presence of other individuals or groups that cause individuals to feel that they will interfere with the existence of values and norms and beliefs of individual cultural and ideological system, such as religion, philosophy, and morality.

2.2. PJ is an evaluation or pre-assessment or prejudgment, that tends to be negative, toward the outgroup and its members. PJ can be seen from the subject's response to the modified Prejudice Scale (SP) from Subtle and Blatant Prejudice Scale (SBPS) from [39] constructed on three main aspects of PJ with $\alpha = 0.809$, namely; (1) stereotypes, as cognitive aspects of perceptions, or judgments that persist and generalized all of the thoughts and ideas about the object of attitude. The content of thought includes things that are known about the attitude object, which can be in the form of responses, beliefs, impressions, attributions, and judgments; (2) emotions, as affective aspects or feelings related to emotional feelings toward object of attitude; and (3) discrimination, as conative aspects of perceptions, namely a tendency or a likelihood to act or react toward something in certain ways [46, 47].

2.3. CA is an individual act that attacks another person or group using information and communication technology in cyberspace. Cyber aggression was measured by the online Assault

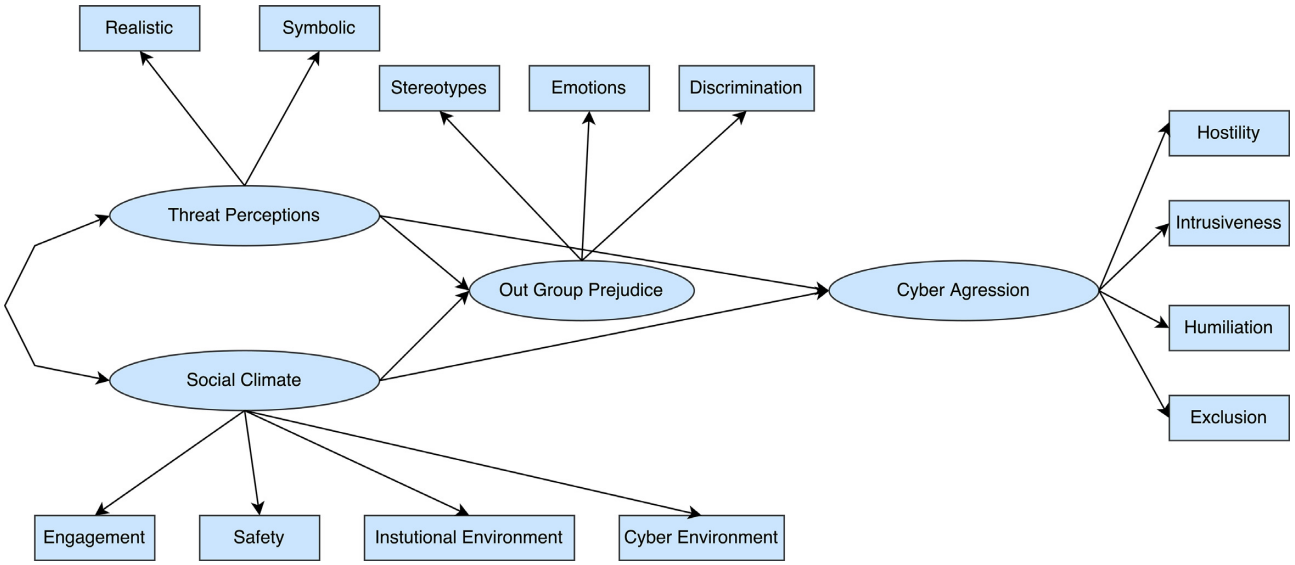

Figure 1: CA design model.

Behavior Scale, namely Cyber Aggression Scale (CAS), with $\alpha = 0.910$, based on four types or forms of CA behavior, namely; (1) hostility, defined as online interactions that attack other people with harsh words, threats, emotional hatred, or flaming; (2) disturbing, defined as online interactions that interferes, disturbs, stalks, and harassment; (3) insulting, defined as online hates, humiliates, ridicules; and (4) exclusion, defined as disfiguring, disgrace, or denigration.

2.4. The SC scale relates to students' perceptions of the quality of their school life character, which is based on their experience of interaction with other individuals such as staff, teachers, and friends, and how norms, goals, and values are applied in interpersonal relationships. This scale consists of four aspects with $\alpha = 0.894$, namely, connectedness, psychological comfort, and social environment support, cyber environment support.

Results

SEM using AMOS 22 was applied to analyze the data. The data collection instruments designed to measure latent variables in a test model. The instruments have passed validity testing in order to ensure the instruments is trustworthy.

1. Convergent validity and variable discriminant reliability testing

   The convergent validity testing carried out for the instruments uses in this research. It was applied for testing size of the factor load values. An indicator is declared valid if the charge factor is positive and >0.45. The results of the validity test can be seen through the following table:

   In Table 1, it shown the indicators of TP, SC, and CA factor load, i.e. generally greater than 0.40, except for the stereotype indicator on PJ, which is only 0.210. However, in general, all indicators are valid and able to measure the variables of TP, SC, PJ, and CA.

   The results of the reliability test in Table 2 shows that TP, SC, PJ, and CA AVE are smaller than 0.5. Meanwhile, the composite reliability (CR) are shown smaller than 0.7. The instruments are less reliable according to AVE and CR, however, according to MSV value all of the instruments are proven reliable for data collection.
2. Model of fit

   The main focus of this study is to test the theoretical model of adolescent CA behavior on social media is in accordance with empirical conditions in the field. This focus is at the same time the main hypothesis of research whether in theory there is an influence of TP, and SC, simultaneously on adolescent CA through PJ.

   The results of model of fit test in Fig. 2 explain that overall, the model is acceptable or hypothetical and it meets conformity index standards or absolute fit measures of thumb rule for SEM.

   Based on of goodness of fit in Table 3, the Chi square (CMIN) and CMIN/DF indexes criteria failed to match cut off values, so both indices are declared unacceptable. The CFI and TLI indexes are 0.925 and 0.901, which is still between 0.850 to 0.95, based on the CFI and TLI indexes the model is declared acceptable. Furthermore, the RMSEA index is 0.058 to the cut off value, so RMSEA index of SEM is declared acceptable. The GFI and AGFI indexes are 0.963 and 0.942 to the cut off value, so that based on the GFI and AGFI index the model is overall can declared acceptable.
3. Hypotheses testing

   Minor hypothesis testing is conducted in order to test direct or indirect contribution of exogenous variables to endogenous variables. The test criteria applied to his testing is $P \leq$ level of significance ($\alpha = 5\%$) indicates a significant contribution of exogenous variables to endogenous variables. To test the minor hypotheses, the path diagram was converted into a structural model. This aim is to find out how the contribution of exogenous variables to endogenous variables. The results of the conversion diagram in this study can be seen in Table 4.

   Based on the conversion of the path diagram into the structural model above, eight direct contribution paths are obtained between exogenous variables and endogenous variables, these contributions are described in more detail in Table 4 as follows:

   In Table 4, TP contributions to PJ is $P = 0.00$ ($P < 0.01$) indicating that the P-value < level of significance ($\alpha = 5\%$), which mean there is a significant contribution of TP to PJ among stu-

Table 1: Construct: variable validity test results

Variables	Indicators	Loading factor	Results
TP	Realistic	0810	Valid
	Symbolic	0554	Valid
SC	Cyber environment	0730	Valid
	Institutional environment	0480	Valid
	Safety	0650	Valid
	Engagement	0830	Valid
PJ	Stereotype	0210	Not valid
	Emotion	0630	Valid
	Discrimination	0610	Valid
CA	Hostility	0730	Valid
	Intrusiveness	0650	Valid
	Humiliation	0660	Valid
	Exclusion	0690	Valid

Table 2: Construct: variable reliability test

Variable	AVE	CR	MSV
TP	0475	0689	0149
SC	0436	0660	0156
PJ	0270	0520	0149
CA	0467	0683	0069

dents. The effect of TP to CA is $P = 0.00$ ($P < 0.01$) indicating $P >$ level of significance (alpha (α) = 5%), which mean there is a significant contribution of TP to CA among students. The SC contributions to PJ is $P = 0.031$ indicating $P <$ level of significance ($\alpha = 5\%$), which mean there is a significant contribution of SC to PJ among students. Then, SC contribution to CA is $P = 0.000$, indicating $P <$ level of significance ($\alpha = 5\%$). This means that there is a significant contribution of SC to CA among students. Contribution of PJ to CA results is $P = 0.010$, indicating $P <$ level of significance (α) = 5%) also found there is a significant contribution of PJ to CA among students.

According to Table 5, there are 10 forms of interactions between exogenous and endogenous variables in three-ways of Equation Model as follows:

$$\mathrm{Y1} = 0,031\mathrm{X1} + -0,029\,\mathrm{X2}. \quad (1)$$

$$\mathrm{Y2} = 0,549\,\mathrm{X1} - -0,141\,\mathrm{X2} + 0,574\,\mathrm{Y1}. \quad (2)$$

Equation (1)

a) The value of direct effect coefficient of TP to PJ is 0.031 indicates that TP has a positive and significant effect on PJ. This means that the higher value of TP it tends to increase Prejudice (P).
b) The value of direct effect coefficient of SC on Prejudice (P) is −0.029 indicates that SC has a negative and significant effect on Prejudice (P). This means that the higher value of TP tends to decrease the SC.

Equation (2)

a) The value of direct effect coefficient of TP on CA is 0.549 indicates the TP has a significant effect on CA. This means that the higher the perceived threat, it tends to increase students' CA.
b) The coefficient value of the direct effect of SC on students' CA behavior is −0.141∗. It says that SC has a negative and significant effect on CA. This means that the higher or positive the SC, the more likely it is to reduce CA.
c) The value of the direct effect coefficient of PJ on adolescent CA is 0.574, which means that PJ has a positive and significant effect on students' CA. This means that the higher the PJ, the more likely it is to increase CA.
d) The indirect effect coefficient value of TP on adolescent CA through PJ is 0.190 saying that TP has a positive and significant effect on adolescent CA through PJ. This means that the higher the TP, it tends to increase PJ so that it will have an impact on increasing adolescent CA.
e) The coefficient value of the indirect effect of SC on students' CA through PJ is −0.017 saying that the SC has a negative and significant effect on CA through PJ. This means that the higher or positive the SC, the more likely it is to reduce PJ so that it will have an impact on reducing student CA but not significantly.

Based on the results of the direct effect analysis between exogenous and endogenous variables, the answers to the hypotheses that have been formulated previously are:

H1: There is a significant contribution of TP to CA behavior among students.

The results of the analysis found that the contribution of TP to CA resulted in a P-value of 0.00 ($P < 0.01$), indicating that P-value > level of significance ($\alpha = 5\%$). This means that there is a significant contribution to the TP to CA, so the hypothesis is accepted.

H2: There is a significant contribution of SC to CA behavior among students.

The results of the analysis showed that the contribution of the SC to CA resulted in a P-value of −0.017, indicating that the P-value > level of significance ($\alpha = 5\%$). This means that there is a significant influence of SC to CA behavior among students. so the hypothesis is accepted.

4. Sobel Test results

The next minor hypothesis is tested by looking at the significance value of the resulting indirect effect. Testing the indirect effect hypothesis aims to test whether there is an indirect effect of exogenous variables on endogenous variables through mediating variables. In this research model, there are four indirect effects between exogenous variables and endogenous variables. This study uses the Sobel test to measure the strength of the indirect effect of independent variable to the dependent variable

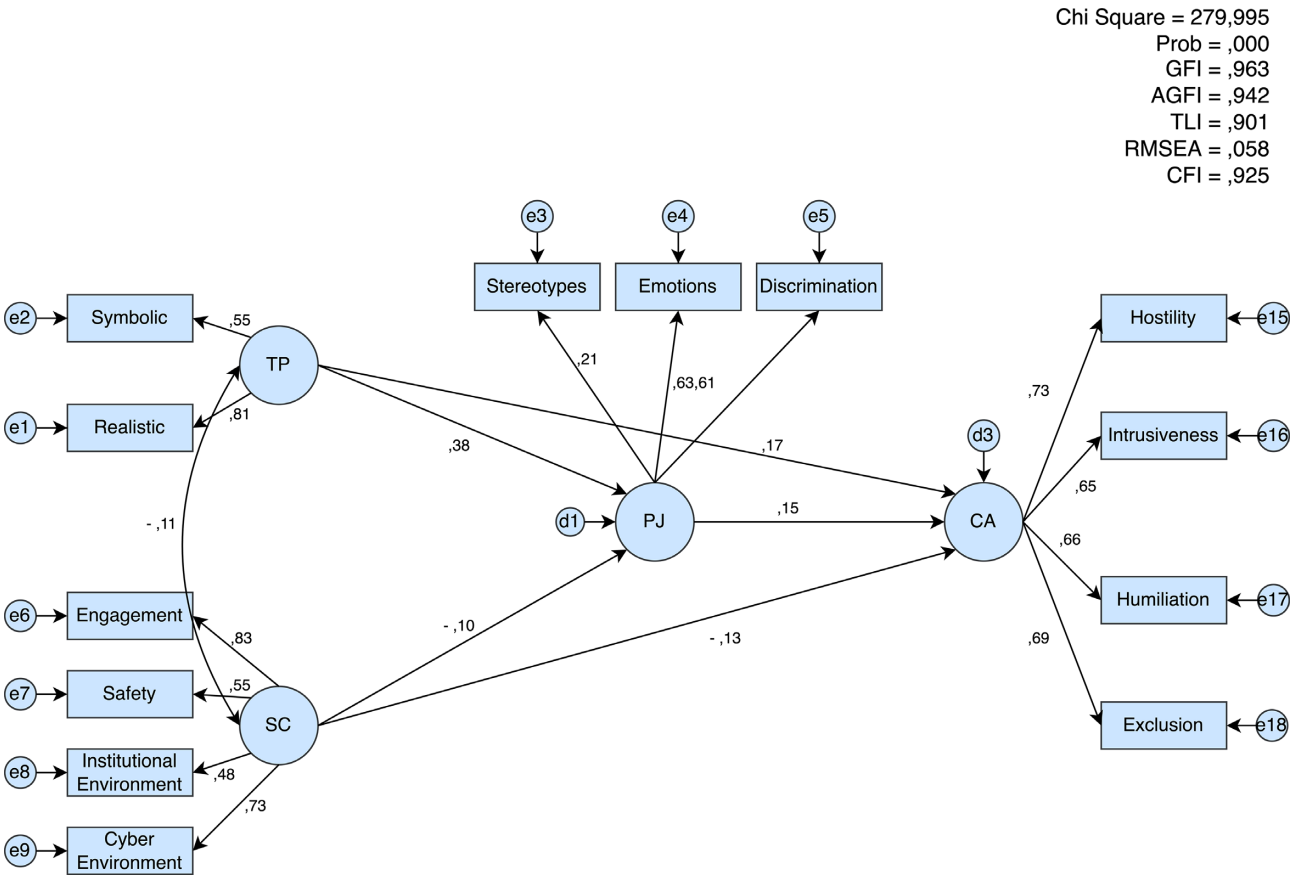

Figure 2: Model of fit of student CA.

Table 3: Model: of fitness results

Index	Goodness of fit	Criteria	Results
Chi square	106 109 ($P = 0.000$)	P-value > alpha 5%	Unacceptable
CMIN/DF	4746	≤ 2.00	Unacceptable
CFI	0.925	≥ 0.92	Acceptable
TLI	0.901	≥ 0.92	Acceptable
RMSEA	0.058	≤ 0.08	Acceptable
GFI	0.963	≥ 0.90	Acceptable
AGFI	0.942	≥ 0.90	Acceptable

through the intervening variable by calculating the standard error of the indirect effect coefficient and calculating the z-value of the mediating effect. The results of the indirect effect analysis in this study can be seen in Table 6 below:

Based on Table 6, it can be concluded that PJ has a significant mediating effect on the contribution of TP to CA with significant P-value of 0.013 ($P < 0.05$). Furthermore, PJ also has a significant mediating effect on the contribution of SC to CA with a significant P-value of 0.045 ($P < 0.05$). This means that effective PJ becomes a mediating variable for the contribution of the two exogenous variables, namely TP and SC on CA. Thus, the results of the Sobel test above answer the next hypothesis that has been prepared in the theoretical framework of this research previously, namely.

H3: There is a significant contribution of TP to Adolescent CA through PJ.

The results of the Sobel test showed that the contribution of TP to CA through PJ resulted in a significant P-value of 0.013, this indicates that the value ($P < 0.05$). This means that there is a significant effect of TP on adolescent CA through PJ, so the hypothesis is accepted.

H4: There is a significant contribution of SC to CA behavior through PJ.

The results of the Sobel test found that the contribution of SC to CA through PJ resulted in a significant P-value of 0.045, this indicates that the value ($P < 0.05$). This means that there is a significant contribution of SC to student's CA through PJ, so the hypothesis is accepted.

Table 4: Direct: effect of exogenous to endogenous variables

			Estimate	S.E.	C.R.	*P*	Label
PJ	←–	TP	,331	,077	4318	***	par_10
PJ	←–	SC	–,029	,013	−2156	,031	par_14
CA	←–	PJ	,574	,222	2584	,010	par_11
CA	←–	TP	,549	,157	3499	***	par_12
CA	←–	SC	–,141	,040	−3506	***	par_13
Realistic	←–	TP	2 914	,435	6699	***	par_1
Symbolic	←–	TP	1 000				
Cyber environment	←–	SC	,867	,046	19 018	***	par_2
Institutional environment	←–	SC	,595	,042	14 022	***	par_3
Safety	←–	SC	,632	,040	15 867	***	par_4
Engagement	←–	SC	1 000				
Stereotypes	←–	PJ	1 000				
Emotions	←–	PJ	2 256	,461	4891	***	par_5
Discrimination	←–	PJ	2 067	,421	4913	***	par_6
Hostility	←–	CA	1 000				
Intrusiveness	←–	CA	,591	,033	17 864	***	par_7
Humiliation	←–	CA	,465	,026	17 973	***	par_8
Exclusion	←–	CA	,495	,027	18 679	***	par_9

Table 5: Contribution: of direct coefficient and indirect coefficient

Exogenous	Mediator	Endogenous	Direct coefficient	Indirect coefficient
TP		PJ	0031	
TP	PJ	CA	0549	0190
SC		PJ	−0029	
SC	PJ	CA	0141	−0017
PJ		CA	0574	

Table 6: Mediation: test results using Sobel test

Exogenous	Mediation	Endogenous	Indirect coefficients	SE indirect	Sobel test	*P*	Results
TP	PJ	CA	0190	0086	2216	0013	Significant
SC	PJ	CA	–,017	0010	−1689	0045	Significant

Disscussion

The results showed that the theoretical model of student's CA was compiled according to the conditions in the field. TP and SC simultaneously affect students' CA mediated by PJ. Based on this, it can be concluded that this study proves that there is a simultaneous influence of TP, and SC, on students' CA through PJ, thus the major hypothesis can be accepted. This is in line with Maxwell [48], which says that conflicts in cyberspace occur because of negative attitudes toward other individuals and groups, where their presence is perceived as a threat by individuals, resulting in negative emotions and leads to hate speech and other cyber-aggressive behavior. Negative emotions and cognitions activated by intergroup threats can trigger negative behavioral responses such as attacks on social media or CA. This means that both TP and PJ are proven in this study as risk factors predictors of student's CA behavior.

Neuroscience explains that aggressiveness involves the interaction between two systems of brain circuits known as biobehavioral, namely Negative Valence Systems (NVS) and Cognitive Systems (CS). According to this theory, response to threats and their Information Processing Systems involve in producing an aggressive behavior in negative emotional situation. This caused the brain circuits has activated by acute threat in NVS and being predisposed to emotional aggressive behavior. This also can be described as the brain circuits that are often perceived threats got more interference in its high order cognitive processes and eventually triggered an act of aggression [49]. Furthermore, in the theory of threat or so called an integrated threat, the TP is grouped into three categories namely the personal threat, intergroup threat, and no threat group. Personal threat, is a threat directly at oneself, e.g. someone who receives criticism at school or at work that made them feel their personally assaulted, labeled and/or categorized, and under condition that deprived their self-resources [50].

The vast characteristics of interactions and communications in cyberspace brings new development in understanding perceptions and PJs between social groups as well as discriminatory behavior from individuals online. This because the interactions are mostly text-based, so those who engage in online communication has so much lack of information compare to if it delivered conventionally in face-to-face communication [6, 8, 51, 52].

Indirect influence analysis shows, threats perception affects student's CA on social media through PJ. This mean that PJ holds an effective role as a mediator for TP related to the occurrence of stu-

dent's CA in social media. These findings are in line with the research of Runions *et al*. [53] who tested functional properties of information and communication technologies that have the potential to affect social information processing for occurrence of CA. According to this study, there are five characteristics of digital media that influence how individuals process social information, such as lack of social cues, availability of permanent data, privacy leaks, one to mass networks direction of communications, and a vast network to facilitate impulsive massages involving negative moods and aggression.

The results of the indirect influence analysis also found the SC had a significant negative effect on CA through PJ. That means that a positive SC can reduce PJ against individuals and or groups and can reduce or even preventing student's CA. These results prove that PJ is an effective mediator between SC and CA behavior among students. This finding confirms the results of Hung *et al*.'s [44] research, which explains that student's positive perceptions of SC such as in class order or in approval of authoritative actions of teachers and school staff, are related to emotional problems, troubling behavior, and peer-victimization. Positive social contact between individuals and groups is necessary in reducing PJ and developing positive attitudes students in ethnically, culturally, and religiously diverse environment. This is also in line with the research of Konold *et al*. [41], which found that a positive SC can increase student engagement with peers and reduce aggression in their interactions.

However, the scope of this study was limited in terms of generalization. Since Indonesia is a big country with rich culture, while the subject of the study consists of teenagers specifically high school students from the west part of Indonesia only. Hence, these results may not be applicable to the wider population of Indonesia teenagers. Another source of uncertainty is the role of self-report instrument that used in this study. This study was investigated a deviant behavior, namely CA, and people usually have the tendencies to look good. So that, it makes the respondent prone to faking good their answers. Although in this study efforts have been made to avoid the possibility of faking good by using several ways, which were: anonymity guarantee that stated in the beginning of the questionnaire and several distractor items. The distractor items were aim to avoid respondent who did not read the questionnaire properly.

Conclusion and future studies

In general, it can be concluded that TP, SC, and PJ have been shown to significantly influence student's CA. PJ is proven to be effective in mediating the influence between TP and SC on student's CA behavior. The research findings show that personal factors such as perceptions of threats and PJ as well as environmental factors such as the SC have been proven simultaneously and significantly influence student's CA behavior in social media. TP and PJ are predictor variables that contribute greatly to student's CA.

Based on the findings of this study, it is recommended for further researchers to design and develop intervention programs through development research and experiments, to produce an effective treatment in preventing and reducing student's CA by controlling TP and PJ variables. Furthermore, socialization agents are needed, especially from educational institutions like school institution, to continue in developing educational curriculum that emphasize in efforts and aim to reduce PJ between individuals and social groups by developing tolerance and mutual respect for differences among student's as cyber citizens especially high school students in the west part of Indonesia. This effort to encourage a better digital citizenship among adolescence could be an effective strategy in order to reduce or even prevent CA among teenagers or students.

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