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How Do Adolescents Cope with Cyberhate? Psychometric Properties and Socio-demographic Differences of a Coping with Cyberhate Scale

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Abstract

Cyberhate exposure can have serious negative impacts on adolescents' development. However, there has been scarce research on adolescents' coping strategies with cyberhate. Deepening the knowledge of how adolescents deal with cyberhate might help researchers, teachers, and parents find a way to alleviate negative effects of cyberhate on adolescents. Therefore, the present study investigates adolescents' coping strategies for cyberhate, while considering differences in adolescents' sex, age, socioeconomic status (SES), and victim status. The sample consists of self-reports of 1480 participants who were between 12 and 17 years old ($M_{\text{age}} = 14.21$ years, $SD = 1.22$) and attended 7th through 10th grades. Results showed that six varying coping strategies could be confirmed, namely Distal advice, Assertiveness, Helplessness/ Self-blame, Close support, Technical coping, and Retaliation. Technical coping was the most frequently used coping strategy followed by Assertiveness, Close support, Helplessness/ Self-blame, Retaliation, and Distal advice. Girls more frequently used all coping strategies, except for Retaliation which had no sex differences. Younger adolescents reported more often using Technical coping than older adolescents. Distal advice and Technical coping were higher among participants with lower SES, compared with adolescents with higher SES. Distal advice and Close support were higher for non-victims than victims, whereas the mean of Retaliation was higher for victims than non-victims. Implications for future research and practice are discussed.

Keywords: Cyberhate, Coping Strategies, Cybervictimization, Hate speech, cyber discrimination

How Do Adolescents Cope with Cyberhate? Psychometric Properties and Socio-demographic Differences of a Coping with Cyberhate Scale

1. Introduction

While the use of information and communication technologies (ICTs) in the lives of adolescents opens up many new opportunities, it has also created new types of risks, such as compulsive internet use, sexting, cyberdating abuse, cyberbullying, cybergrooming, or potentially negative forms of user-generated content (e.g., self-harm, suicide) (Gámez-Guadix, Orue, Smith, & Calvete, 2013; Görzig, 2016; Machimbarrena et al., 2018; Van Ouytsel, Walrave, Lu, Temple, & Ponnet, 2018; Wachs et al., 2018; Wright, Harper, & Wachs, 2019). One form of bias based cyberaggression that is receiving current attention around the world is cyberhate. Cyberhate is defined as the perpetration or advocacy of negative actions through ICTs, which targets a group or person due to their gender, sexual orientation, disability, race, ethnicity, nationality, or religion. Cyberhate can be offensive, mean, or threatening, and can be expressed through degrading writings or speech online, such as posts, comments, text messages, videos or pictures (Costello, Rukus, & Hawdon, 2019; Hawdon, Oksanen, & Räsänen, 2017; Wachs & Wright, 2018).

Hatred against groups and individuals is by no means new but it has assumed a new dimension as an everyday phenomenon in the online world (Kaakinen, Oksanen, & Räsänen, 2018). Indeed, the online environment seems to be the place where adolescents are most likely to experience bias based hate, compared with offline settings, such as in school or in families (UK Safer Internet Centre, 2016).

Consequently, an emerging question is how adolescents cope with cyberhate in the online environment. To answer this question, the present study aims to investigate coping strategies for cyberhate among adolescents, while considering differences in

adolescents' sex, age, socioeconomic status, and victim status. The results of the present study inform the planning and development of intervention programs to support adolescents' ability to deal with cyberhate and thus, mitigating potential negative effects.

1.1. Cyberhate among adolescents: An understudied topic with potential harm

Given that most research investigated the nature of cyberhate but not the frequency rates (Oksanen, Hawdon, Holkeri, Näsi, & Räsänen, 2014), it is not surprising that not much is known about the frequency rates of cyberhate among adolescents. Initial research, however, suggests that the most common way to experience cyberhate is by witnessing these behaviors as a bystander. In one study among 3,500 adolescents and young adults between the ages of 15 to 30 from four countries, approximately 53% of American, 48% of Finnish, 39% of British, and 31% German participants said they have witnessed cyberhate. In the same study, 16% of American, 10% of Finnish, 12% of British and 4% of German participants reported that they have been personally targeted by cyberhate (Hawdon, Oksanen, & Räsänen, 2015). More recently, a study with 1,889 French participants aged 11 to 20 found that around 57% of participants were exposed to online hate, approximately 10% were victimized through online hate on social networking sites and 5% published or shared online hate material (Blaya & Audrin, 2019). There is also some evidence that people's exposure to cyberhate becomes more common due to the increase of people's online interactivity (Costello et al., 2019). For example, a trend was found in a study with seven European countries in which 11 to 16 years old participants' exposure to cyberhate rose from 13% in 2010 to 20% in 2013 (Livingstone, Mascheroni, Ólafsson, & Haddon, 2014).

Previous research has shown how being discriminated against can affect adolescents' psychological functioning. For example, in one study with a population-

based sample of 17,366 Danish middle and high school students, students who experienced bias-based harassment were at greater risk of reporting adjustment problems, such as mental health problems, panic symptoms, and suicidal ideation and attempts (Sinclair, Bauman, Poteat, Koenig, & Russell, 2012). Consistent with studies on offline discrimination, online discrimination was found to be negatively associated with wellbeing and psychological health among adolescents. In one study with 264 high school students, online racial discrimination was significantly related to depression and anxiety (Tynes, Giang, Williams, & Thompson, 2008).

Regarding cyberhate, recent research revealed that after being exposed to cyberhate material, 37% of adolescents reported being angry, 34% upset, and 30% shocked (UK Safer Internet Centre, 2016). In another study with 723 adolescents between the ages of 15 and 18 from Finland, exposure to cyberhate was associated with poor attachment to family and physical offline victimization (Oksanen et al., 2014). Understanding adolescents' coping strategies for cyberhate is important because constructive coping strategies have shown to mitigate negative impacts and prevent future victimization (Hyland, Lewis, McGuckin, & Hyland, 2016; Kochenderfer-Ladd & Skinner, 2002; Machmutow, Perren, Sticca, & Alsaker, 2012).

1.2. How do adolescents cope with cyberhate?

When adolescents experience a stressful event they attempt to mitigate, reduce, or eliminate the negative effects of this event. This process is referred to as coping, which is defined as the effort exerted to manage environmental stress and the subsequent emotions triggered from such stress (Lazarus, 2006). According to Lazarus and Folkman (1987), the event itself is not harmful, threatening, or challenging, but it is individuals' evaluation of the event that provides meaning. Once appraisal of a stressful

event occurs, individuals decide on the coping strategy or strategies to use and then enact the chosen strategies (Lazarus & Folkman, 1987).

Thus far, little attention has been given to adolescents' coping strategies to deal with cyberhate. In one study, 20% of adolescents indicated that they were unsure of what to do if they were to encounter cyberhate (UK Safer Internet Centre, 2016). If these adolescents were targeted directly by cyberhate, 43% ignored it, 25% reported it to the social networking website, app, game, or website, 21% spoke to a friend, 18% blocked the perpetrator, 13% indicated that they told a parent or another adult, 13% replied publicly to the perpetrator, 4% informed a teacher or other professional, and 2% reported the behavior to the police. In addition, 45% of the adolescents who had witnessed cyberhate were concerned that standing up to cyberhate might result in them being the next target (UK Safer Internet Centre, 2016).

More research has investigated how adolescents cope with cyberbullying. In one study, the three most frequently strategies to cope with cyberbullying reported by adolescents from Switzerland and Ireland were seeking close support, active ignoring, and assertiveness (Sticca et al., 2015). In another study, the most often reported coping strategies by cybervictims were depreciating the cyberbully, asking for social support, blocking the cyberbully, and avoiding thoughts about the incident (Machackova, Cerna, Sevcikova, Dedkova, & Daneback, 2013).

1.3. Differences in coping strategies by sex, age, SES, and victimization status

Some differences by sex in the implementation of coping strategies for cyberhate have been found. More girls (20%) than boys (12%) were likely to talk to a friend about experiencing cyberhate or report the incident to the service provider (20% vs. 12%; UK Safer Internet Centre, 2016). In addition, girls (12%) were also more likely to reply publicly to the perpetrator of cyberhate than boys (6%). However, 59% of

boys in the same study reported that they would ignore cyberhate in comparison to 48% of girls (UK Safer Internet Centre, 2016). These findings for cyberhate are somewhat but not fully mirrored by the gender differences in coping responses found for cyberbullying which suggest that responses are aligned with gender-stereotypic expectations (e.g., Spence & Buckner, 2000); for instance, more social coping styles were found to be prevalent amongst girls, who were more likely to seek help or talk to someone about the incidence (e.g., Dooley, Gradinger, Strohmeier, Cross, & Spiel, 2010; Livingstone, Görzig, & Ólafsson, 2011; UK Safer Internet Centre, 2016), and a more aggressive coping style was prevalent amongst boys, who were more likely to retaliate (Machmutow et al., 2012). Our research seeks to explore further whether coping responses for cyberhate similarly follow those gender-stereotypic patterns.

Regarding age, it was found that after exposure to cyberhate approximately 18% of younger adolescents (13-15 years old) reported that they would speak to a parent or another adult when compared to 5% of older adolescents (16-18 years old; UK Safer Internet Centre, 2016). Similarly, research on cyberbullying showed younger adolescents were more likely to talk to someone and most likely to a parent (Livingstone et al., 2011; Perren et al., 2012; Skrzypiec, Slee, Murray-Harvey, & Pereira, 2011). This may be due to the developmental changes which often cause older adolescents to distance themselves from adults and especially their parents in search of independence whilst focusing more on their peers (Steinberg, 2011). Hence, we would expect that in the face of cyberhate, younger adolescents would also be more likely to talk about these experiences with their parent or another adult compared to older adolescents.

Although to the best of our knowledge no research has been conducted on differences in coping strategies for cyberhate across different socioeconomic statuses

(SES), there are some findings with regards to cyberbullying. Coping strategies such as deleting messages, blocking the perpetrator or speaking about the incident were more likely amongst those with low SES (Livingstone et al., 2011; Vandoninck, d'Haenen, & Segerss, 2012). However, the literature on general coping strategies reveals some differences that point in another direction. Roohafza et al. (2009) found that higher SES was positively correlated with adaptive coping strategies (e.g., positive self-instructions, seeking social support, humor) among adults. From a theoretical point of view, higher SES relates to beliefs in personal control or mastery, optimism, and social support (Cohen, Kaplan, & Salonen, 1999; Lachman & Weaver, 1998; Pearlin, Menaghan, Lieberman, & Mullan, 1981). The majority of research on SES differences in coping strategies focus on adults, with some research attention on adolescents. In this literature, adolescents from high SES reported more positive coping strategies (e.g., problem-solving, emotional expression) when compared to adolescents from low SES (Glasscock, Andersen, Labriola, Rasmussen, & Hansen, 2013; Iqbal & Nishat, 2017). To explain these differences, it is proposed that family conditions of adolescents who are economically deprived might be more fragile, which more directly affects these adolescents (Iqbal & Nishat, 2017). Furthermore, their daily lives might involve chronic stress, discrimination, and powerlessness (Baum, Cohen, & Hall, 1993; Lantz, House, Mero, & Williams, 2005; McEwen, 1998). Hence, we would expect adolescents with a higher SES to show more adaptive coping strategies with regards to cyberhate than those with lower SES. However, given the contrasting findings from research on cyberbullying, our investigation remains exploratory in this area.

In terms of differential coping strategies between victims and non-victims of cyberhate, there is some albeit less conclusive research than research on cyberbullying and cyber aggression. For example, in one study among children aged 11- and 12-years

victims of cyberbullying differed from non-victims in that they used more emotion-focused coping strategies for daily stressors. However, no differences were found between victims and non-victims of cyberbullying concerning the use of active problem-focused coping strategies, avoidance coping, and optimistic coping (Völlink, Bolman, Dehue, & Jacobs, 2013). In another study, 2,092 Czech children aged 12-18 cyberbullying victims showed in comparison with victims of less severe cyber harassment similar coping patterns regarding the high use of technical coping, social support, and a low tendency for retaliation. However, both groups differed largely concerning cognitive coping (Machackova et al., 2013).

A perhaps more apparent theoretical approach can be derived from research in the tradition of routine activity theory (Cohen & Felsen, 1979) which investigated the suitability of a target for the reception of hateful content. It was shown that those who engaged in confrontational conflict resolution styles generally behaved antagonistically online were at higher risk of victimization (Costello, Hawdon, & Ratliff, 2017; Hawdon, Costello, Ratliff, Hall, & Middleton, 2017). These findings offer some indication that coping responses such as retaliation or assertiveness may be more prevalent among victims of cyberhate. The general engagement in more hateful or antagonizing activities online should enhance target suitability for the reception of hateful messages. Hence, we would expect to find an association between victimization status and those kinds of activities.

1.4. Aims of the study

In sum, previous research suggests that adolescents are frequently exposed to cyberhate and often feel targeted by it (Blaya & Audrin, 2019; Hawdon et al., 2015). Further, there is some evidence that adolescents' cyberhate exposure has risen in the last few years (Costello et al., 2019; Livingstone et al., 2014). There is also some evidence

that the exposure and victimization through cyberhate might impact adolescents psychological functioning (Oksanen et al., 2014; Sinclair et al., 2012; Tynes et al., 2008; UK Safer Internet Centre, 2016). There is some evidence that adolescents' use of coping strategies is related to their sex (Dooley et al., 2010; Livingstone et al., 2011; Machmutow et al., 2012; UK Safer Internet Centre, 2016), age (Livingstone et al., 2011; Perren et al., 2012; Skrzypiec et al., 2011; UK Safer Internet Centre, 2016), SES (Baum et al., 1993; Glasscock et al., 2013; Iqbal & Nishat, 2017; Lantz et al., 2005; Livingstone et al., 2011; McEwen, 1998; Vandoninck et al., 2012) and victimization status (Costello et al. 2017; Hawdon et al., 2017; Völlink et al., 2013; Machackova et al., 2013). Thus, differences by these factors need to be considered.

Despite its relevance and high prevalence of cyberhate, to date, there is no validated instrument with adequate psychometric properties to measure coping with cyberhate in a comprehensive manner. Therefore, the objectives of the present study are as follows: First, to study the psychometric properties of an instrument to measure coping strategies with cyberhate. For this purpose, we adapted a validated multidimensional instrument that was originally developed to investigate coping strategies with cyberbullying. We used this instrument because cyberhate shows remarkable similarities with cyberbullying. Both online behaviors are carried out to intentionally harm and devalue a person or group by utilizing ICTs. Although cyberbullying is often directed at an individual person, it can also be based on prejudicial views of minority groups, like cyberhate (Costello et al., 2017; Sponholz, 2018; Wachs & Wright, 2019). Our second aim was to study the frequency rates of each coping strategy used by adolescents to deal with cyberhate. Finally, our third aim was to assess the differences in copings strategies based on sex, age, SES and victimization status.

2. Methods

2.1. Participants

The sample consists of 1480 German adolescents between 12 and 17 years ($M_{\text{age}} = 14.21$ years, $SD = 1.22$) who attended 7th to 10th grade. Regarding sex, 744 (50.3%) of the participants were female and 736 were male (49.7%). Around 10% ($n = 144$) reported that German is not the main language spoken at home. Around one third of all participants (33.6%; $n = 483$) stated that they live in families of low affluence. Table 1 shows the demographic characteristics of the participants, broken down by grade, sex, and socioeconomic status.

-- PLEASE INSERT TABLE 1 ABOUT HERE --

2.2. Measures

2.2.1. Coping with cyberhate and victim status

Coping strategies for cyberhate was assessed by using the Coping with Cyberbullying Questionnaire developed by Sticca et al. (2015). In our adaptation of this instrument, participants were presented first with a definition of cyberhate:

“Cyberhate describes the usage of information and communication technologies (e.g. WhatsApp, Facebook, Instagram, Twitter) to offend and hurt somebody because of his or her race, gender, ethnic group, nationality, disability, sexual orientation, or religion. It can be either targeted directly at a person or group, or generally shared online. Cyberhate can be offensive, mean or threatening and can be expressed through degrading writings or speech online such as posts, comments, text messages, videos or pictures.”

Then we gave a description of the following scenario to the students:

“A person has expressed hateful or degrading writings or speech online through posts, comments, text messages, videos or pictures, which inappropriately

attacked you because of your race, gender, ethnic group, sexual orientation, or religion via chats or social networks (e.g. Facebook, Instagram, WhatsApp). ”

After the description we asked: *“Have you ever experienced a situation of this kind?”*

Students could answer with “no” (0) or “yes” (1). When students answered that they had experienced cyberhate victimization, they were asked what they did to cope with it and if students did not experience a situation like that, they were asked to imagine how they would cope with cyberhate victimization.

To describe their coping strategies, adolescents were given 20 reactions reflecting six subscales: (1) Distal advice includes (DA; e.g., “...go to the police”); (2) Assertiveness (AS; e.g., “... tell the person to stop it”); (3) Helplessness/ Self-blame (HS; e.g., “...not know what to do”); (4) Close support (CS; e.g., “...spend time with my friends to take my mind off it”); (5) Technical coping (TC; e.g., “...block that person so that he/she cannot contact me anymore”); (6) Retaliation (RET; e.g., “...do it back”). Participants rated how likely they were to use each of the 20 coping actions on a scale ranging from “definitely not” (0) to “definitely” (3). Table 3 gives an overview of all 20 coping actions.

2.2.2. Sex, age, and SES

For demographic characteristics, participants were asked for their sex (girl/ boy) and which grade they attend. To assess family socioeconomic status, adolescents answered questions on the Family Affluence Scale (FAS; Boyce, Torsheim, Currie, & Zambon, 2006), which has been shown to be a valid instrument to measure adolescents' socioeconomic status (Hobza, Hamrik, Bucksch, & De Clercq, 2017). The FAS consists of six items, such as “Do you have your own bedroom?” (No = 0; Yes = 1).

2.3. Procedures

The data protection officer and education authority of the federal state of Bremen, Germany approved this study and all materials. Using a list of 167 schools, 20 schools were randomly selected for recruitment. There were nine school principals who did not reply to the recruitment email, four expressed interest in the study but had other commitments preventing them from participating, and seven agreed to allow their school to participate. As the adolescents were underage, parents had to sign a written consent form allowing them to participate. A letter and parental permission slip were distributed to adolescents. There were 1788 parental permission slips passed out to the students. The response rate at the individual level was 82.7% ($N = 1480$). In total, 308 students were not surveyed. Reasons for not participating in this study were missing written parental consent, sick note, absence because of projects or internship, refusal to participate, unexcused absence from school, being new to the class and therefore not informed about the survey or having refugee status (i.e., missing German language skills). During data collection, an online survey was administered in the school's computer lab during one regular school hour. Instructions were given to adolescents concerning their participation. Participants were told that their participation was strictly anonymous, their participation was optional, they could choose not to answer questions, and that participation could be stopped at any time without giving a reason and with no consequence. To prevent distress and further harm by participating in this study, participants were given written information about whom they could talk to if they believed they needed counseling; this information was also conveyed orally as well.

2.4. Data Analyses

To conduct the confirmatory factor analysis, we used EQS 6.1 software (Bentler & Wu, 2005). Due to a violation of the normality assumption that was observed in the data (normalized Mardia's coefficient = 62.9), we employed the robust maximum

likelihood (ML) estimation method, which includes the Satorra-Bentler scaled χ^2 index (S-B χ^2), and other corrected statistics. To study the adequacy of the estimated models, we used the non-normative fit index (NNFI), the comparative fit index (CFI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA). For the NNFI and the CFI, values over .90 indicate acceptable fit, whereas values over .95 indicate a good fit. Values on the SRMR and the RMSEA near .05 indicate an excellent fit, whereas values between .05 and .08 indicate an acceptable fit (Byrne, 2013; Hu & Bentler, 1999). The first item for each factor was fixed at 1.

Jia and Jia (2009) recommended using confirmatory factor analysis on the various alternative models that differ in factor structure and complexity. This analysis allows the identification of the factor structure that best fits the data and establishes the factor validity of the scale (MacCallum, Roznowski, & Necowitz, 1992). Therefore, we estimated three alternative models: 1) a single factor model; 2) a six-factor model with uncorrelated factors; and 3) the null model.

Factorial invariance and latent mean differences were analyzed testing the multigroup equivalence of the instrument across groups. Specially, we analyzed differences in the instrument as a function of being victims or non-victims, boys or girls, the lower or the higher academic grades (comparing grades 7th-8th to grades 9th-10th), and lower or higher socioeconomic status (splitting out the sample using the percentile 50th in the Affluence Scale). The invariance of the factor structure was analyzed following a series of steps: (1) establishing and testing the configural models, in which the hypothesized model was tested for each group separately (e.g., for boys and girls) and for both groups simultaneously (i.e., the unrestricted model with no equality constraints on the parameters); (2) testing the measurement equivalence of

factor loadings, in which loadings for all the latent factors were constrained to be equal across groups; (3) analyzing structural equivalence, in which equality constraints are now specified for the factor covariances; and (4) testing the invariance of intercepts, in which intercepts were constrained to be equal across groups. Models 2 and 3 were compared against the unrestricted model using the difference in CFI (ΔCFI) to evaluate presence of invariance (Meade, Johnson, & Braddy, 2008). A value of ΔCFI smaller than or equal to .002 suggests that the null hypothesis of invariance should not be rejected (Meade et al., 2008). When results showed absence of invariance, modification indices (Mis) provided by EQS were used to identify specific sources of invariance.

Between 5.1% and 6.7% of the data were missing in the coping items. Missing values in the items were imputed using full information maximum likelihood (FIML), along with the Satorra-Bentler Scaled Chi-Square, which has been shown to produce unbiased parameter estimates and standard errors with values missing at random (Acock, 2005).

3. Results

3.1. Frequency rates of cyberhate victimization

Overall, 17.2% ($n = 246$) of all participants reported that they have experienced cyberhate victimization and 82.8% ($n = 1183$) stated that they have not been victimized through cyberhate before. No significant sex differences were found between girls (19%) and boys (15.4%) regarding cyberhate victimization, $\chi^2(1, N = 1429) = 3.18, p = .074$. There were, also, no age differences between victims ($M = 14.23, SD = 1.20$) and non-victims of cyberhate ($M = 14.18, SD = 1.22$), $t(1427) = -0.592, p = .639$. Finally, no significant differences were found in victims of low family affluences (33.9%), middle family affluence (31.7%), and high family affluence (35 %), $\chi^2(2, N = 1385) = 0.580, p = .748$.

3.2. Psychometric properties of the coping with cyberhate questionnaire

The proposed measurement model (Model 1) examined the structure of six correlated factors, namely: Distal advice, Assertiveness, Helplessness/ Self-blame, Close support, Technical coping, and Retaliation. As recommended by Jia and Jia (2009), we compared three alternative models (Models 2-4) with the hypothesized model. Model 2 included a single factor, "coping with cyberhate" on which all of the items were loaded. Model 3 included the same six factors examined in Model 1 but uncorrelated. Model 4 was a null model in which all items loaded on separate uncorrelated factors. As shown in Table 2, of the for models analyzed, only Model 1 showed satisfactory fit indices, $SB \chi^2 (155) = 895.22, p < .001$, NNFI = .94, CFI = .95, SMRS = .057, RMSEA = .061, 90% CI [.057, .065]. The fit of the other models (Models 2-4) was poor (e.g., CFI < .81, RMSEA > .11).

-- PLEASE INSERT TABLE 2 ABOUT HERE --

Figure 1 shows the standardized values of the regression coefficients of each item for its respective factor in Model 1. As shown in the figure, the factor loadings of the items ranged between 0.63 and 0.95 (all $ps < .001$). Similarly, all of the correlations between the latent variables were statistically significant, with values ranging from .11 ($p < .05$; correlation between Distal advice and Retaliation) to .75 ($p < .001$; relationship between Close support and Distal coping). Internal consistency (Cronbach alpha) was adequate for the factors with values of .70, .91, .85, .85, .83, and .84, for Distal advice, Assertiveness, Helplessness/ Self-blame, Close support, Technical coping, and Retaliation, respectively.

-- PLEASE INSERT FIGURE 1 ABOUT HERE --

3.3. Frequencies of coping strategies

To identify the most often and less often used reactions to cyberhate we dichotomized the coping items (no = definitely not and probably not; yes = probably and definitely). As shown in Table 3, the most frequently used actions adolescents used to cope with cyberhate were: “...*save messages/pictures as evidence (e.g., copies or screenshots)*” (63.2%; TC 3); “...*pay more attention to who gets access to my data*” (60.8%; TC 1); “...*let the person know that his behavior is not acceptable at all*” (64.6%; AS 2); “...*tell the person to stop it*” (69.2%; AS 3); and “...*block that person so that he/she cannot contact me anymore*” (74.5%; TC 2). The five less frequently used reactions adolescents used to cope with cyberhate were “...*call a helpline*” (9%; DA 3); “...*be completely desperate*” (18.4%; HS 1); “...*do it back*” (18.4%; RET 3); “...*not know what to do*” (18.8%; HS 3); and “...*inform a teacher or the principal*” (19.9%; DA 2). Table 3 gives a full summary over frequencies of all reactions to cyberhate. Averaging percentages of all items of each subscale revealed that TC (66.1%) is the most often used coping strategy followed by AS (59.9%), CS (52.3%), HS (22.6%), RET (21.9%), and DA (21.1%).

-- PLEASE INSERT TABLE 3 ABOUT HERE --

3.4. Differences as a function of sex, grade, SES, and victimization status

We analyzed the differences in the coping with cyberhate scales based on participants' sex, age, socioeconomic status, and victim status. The medium scores of each scale obtained from testing the invariance of intercepts as a function of those variables are presented in Table 3.

Regarding sex, we found that the 6-factor structure showed good fit for both sexes (boys: $S-B \chi^2 (155, n = 736) = 569.69$; NNFI = .93, CFI = .94, SRMR = .063, RMSEA = .065 (90% CI: .059–.070); girls: $S-B \chi^2 (155, n = 744) = 517$; NNFI = .92, CFI = .94, SRMR = .063, RMSEA = .061 (90% CI: .055–.067)]. Analyses of

measurement equivalence of factor loadings showed significant differences between boys and girls ($\Delta CFI = .004$). Specifically, the item “go to someone who listens to me and comforts me” (CS 2) was stronger for girls than for boys, whereas the item “threaten the person so he/she stops” (RET 3) was stronger for boys. Similarly, analyses of structural invariance showed that factor covariances were nonequivalent across groups ($\Delta CFI = .006$). Thus, the correlations between Helplessness/ Self-blame and Technical coping and between Helplessness/ Self-blame and Close support were stronger for females, even when they were significant for both males and females. Finally, the invariance of factor intercepts indicated that the means of five out six factors were significantly different between boys and girls. Specifically, girls report more use of all the coping strategies, except for Retaliation which had no sex differences.

Regarding academic grade, the 6-factor structure showed good fit for grades 7th and 8th (S-B χ^2 (155) = 550.112; NNFI = .95, CFI = .96, SRMR = .053, RMSEA = .059 (90% CI: .053–.064) as well as for grades 9th and 10th (S-B χ^2 (155) = 494.14; NNFI = .93, CFI = .94, SRMR = .065, RMSEA = .064 (90% CI: .058–.070)]. Second, we verified whether factor loading and relations between factors were invariant across grades. We estimated a model in which factor loadings were constricted to be equal across both subsamples. This imposition was tenable, as CFI change was .001. Next, we tested whether covariances between latent variables were equal across both subsamples. This imposition involved a ΔCFI of .002, showing equivalence of covariances across lower and higher levels of SES. Finally, the analyses of the invariance of intercepts indicated that grades 7th and 8th reported more technical coping than grades 9th and 10th.

The analyses on socioeconomic status indicated that the model fit adequately for both lower (S-B χ^2 (155) = 456.03; NNFI = .94, CFI = .96, SRMR = .056, RMSEA

= .056, 90% CI: .050–.062) and higher levels (S–B χ^2 (155) = 549.41; NNFI = .94, CFI = .95, SRMR = .062, RMSEA = .064, 90% CI: .058–.070)]. Analyses of measurement equivalence and structural equivalence revealed that factor loadings (Δ CFI = .001) and factor covariances (Δ CFI = .001) were equivalent across academic grades. Finally, the analyses of the invariance of latent factor means showed that the factors of Distal advice and Technical coping were statistically different across groups, and were higher for participants with lower SES.

Finally, we investigated whether the relationship between the variables in the model differed depending on whether adolescents had been victims of cyberhate or not. We found, first, that the model fit was adequate for both victims and non-victims separately [victims: S–B χ^2 (155) = 261.84, NNFI = 0.95, CFI = .96, SRMR = .065, RMSEA = .057 (90% CI: .044–.068); non-victims: S–B χ^2 (155, n = 319) = 806.61, NNFI = .93, CFI = .95, SRMR = .058, RMSEA = .063 (90% CI: .059–.067)]. Second, we estimated a model in which all factor loadings were freely estimated for each group (unrestricted model). Then, a new model in which all factor loadings of the indicators were set as equal between victims and non-victims was estimated. This imposition involved a Δ CFI of .002, which is indicative of equivalence in the measurement model across groups. Next, equality constraints were specified for the factors covariances. The difference in CFI values were .001, indicating that relations among the factors of coping are invariant across victims and non-victims. Finally, we tested for the invariance of the intercepts across groups. The results indicated that the means of Distal advice and Close support were higher for non-victims, whereas the mean of Retaliation was higher for victims (see Table 4).

-- PLEASE INSERT TABLE 4 ABOUT HERE --

4. Discussion

The purpose of the present study was threefold. First, to investigate the psychometric properties of a multidimensional research tool for the measurement of coping strategies for cyberhate. Second, to explore the frequency rates of each coping strategy. Third, to assess the differences in copings strategies based on adolescents' sex, age, SES, and victimization status. In the following sections, the results will be discussed in relation to the three research aims. Given that research on coping with cyberhate is scarce or close to non-existent, the results, where applicable, will be compared to those for coping with cyberbullying.

4.1. Psychometric properties of an instrument measuring coping with cyberhate

The current study demonstrated adequate psychometric properties of a measurement instrument to assess coping strategies with cyberhate victimization within a large sample of adolescents. Confirmatory factor analysis showed that a model with six correlated factors could be confirmed and was in fact the only model tested that yielded satisfactory fit indices. The instrument provides a total overall coping score as well as six sub-scale scores measuring: 1) Distal advice, 2) Assertiveness, 3) Helplessness/ self-blame, 4) Close support, 5) Technical coping, and 6) Retaliation.

For the current study, a measure of coping with cyberbullying was adapted to assess coping with cyberhate. This measure has previously been used in adolescent samples across different countries, including a German version of the scale (Sticca et al., 2015). Moreover, despite the existence of other measures assessing coping with cyberbullying (e.g., Livingstone et al., 2011; Machackova et al., 2013) to the best of our knowledge, this is the only measure which has been developed and tested psychometrically. The findings presented here support assumptions that for cyberhate victimization, the use of coping strategies by adolescents is represented on similar dimensions as for cyberbullying victimization. This suggests that beyond a conceptual

and empirical overlap between cyberhate and cyberbullying (Blaya & Audrin, 2019; Wachs, Wright, & Vazsonyi, 2019), the impact on adolescents' behaviors and emotions may be similar. Notably, as was the case for the cyberbullying measure (Sticca et al., 2015), correlations between the latent factors were positive and significant. This finding supports the notion that coping strategies tend to complement each other (Lazarus, 2006). In terms of validity, whilst yielding good internal validity, similar to the scale on coping with cyberbullying, its predictive validity needs to be assessed in future studies (Sticca et al., 2015).

4.2. Frequency rates of each coping strategy used to deal with cyberhate

In terms of the types of coping strategies, the items that received the highest ratings were located on the subscales for Technical Coping and Assertiveness, whilst those least endorsed were the factors Helplessness/Self-blame, Retaliation, and Distal Advice. These findings were mirrored in the average ratings per subscale in the same order, whereby Close support was additionally shown as the third most endorsed coping subscale.

These findings reflect similar patterns to those shown in the study by Sticca et al. (2015) where the measure was developed and tested with regards to coping with cyberbullying. Technical coping (where assessed), Assertiveness and Close Support were also the most strongly endorsed subscales in their study. The findings from the present study were similar to findings on coping with cyberbullying from a sample of Czech adolescents (Machackova et al., 2013). Coping strategies that were conceptually equivalent to the present subscales for Technical coping and Close support were endorsed by most whilst those reflecting Retaliation were least endorsed. In agreement with Sticca et al. (2015), their study did additionally show a high endorsement for strategies associated with 'depreciating the aggressor', conceptually similar to the

original subscale for Active ignoring. In other research on coping with cyberbullying, strategies reflecting a conceptual overlap with the subscales for Technical coping and Close support were also seen as the most commonly employed whilst strategies resembling the subscales of Retaliation and Distal advice were comparatively less endorsed (Livingstone et al., 2011).

In contrast to the findings from the current study, other research on cyberhate (UK Safer Internet Centre, 2016) has shown that the most endorsed coping strategy was passive 'ignoring' (43%) if they were personally targeted by cyberhate and exposed to online hate without being targeted directly (64%), i.e. conceptually similar to the subscale for Helplessness/ Self-blame in the current study. This was followed by strategies closely resembling the subscales for Close support, Technical coping, and Distal advice (ca. 20% each). The relatively high endorsement for passive ignoring compared to the current study and previous research assessing coping with cyberbullying is puzzling here. Generally, the proportion of endorsement for coping strategies was comparatively low in this study, which may point to differences in methodology and sampling. While the other studies discussed have collected data face-to-face and mostly in schools, this study conducted by the UK Safer Internet Centre has collected data online via ResearchBods. The implications of this are unknown but may need further consideration.

Overall our findings are somewhat encouraging because adolescents used mostly constructive coping strategies, such as Technical Coping, Assertiveness, and Close support; these are coping strategies that have also been considered to be amongst the most effective (Machackova et al., 2013; Price & Dalgleish, 2010). Further research suggests that Close support and Technical coping are the most regularly cited as effective coping strategies for responding to cyberbullying (DeHue, Bolman, & Völlink,

2008; Görzig & Machackova, 2016). These coping responses have further been associated with higher levels of digital skills and self-efficacy (Görzig & Machackova, 2016). The present results suggest that these characteristics may also be beneficial for coping effectively with cyberhate and may therefore be suggested for intervention programs focusing on building resilience. Further, the agreement of the current findings with the patterns of coping strategies employed for cyberbullying provides further reassurances for the validity of the measurement instrument as well as the similarity in coping responses across cyberhate and cyberbullying incidences (Blaya, 2019)

4.3. Differences in coping strategies based on sex, age, SES, and victimization status

Girls reported more frequently using all coping strategies, except for Retaliation, with one of the items (“threaten the person, so he/she stops”) more strongly endorsed by boys. Younger adolescents reported more often using Technical coping than older adolescents. Distal advice and Technical coping were higher among participants with lower SES compared to adolescents with higher SES. Distal advice and Close support were higher for non-victims, whereas the mean of Retaliation was higher for victims.

Previous research on coping with cyberbullying confirms the existence of gender differences. In particular, help-seeking and talking to someone is usually more endorsed by girls (e.g., Dooley et al., 2010) who are specifically more likely to talk to a friend about the incidence (Livingstone et al., 2011; UK Safer Internet Centre, 2016). Additionally, others report that girls are more likely to respond fatalistically (Vandoninck et al., 2012), conceptually similar to Helplessness, whilst others confirmed that retaliation is more widely applied by boys (Machmutow et al., 2012). Gender differences on the other factors were either not reported or not confirmed in previous research on coping with cyberbullying. As expected, girls higher prevalence for seeking

social support as well as their higher propensity to respond with helplessness mirror traditional gender stereotypes (Eagly & Steffen, 1984; Spence & Buckner, 2000) which have shown to be particularly influential during adolescence. Given that seeking social support was shown to be more effective for girls than for boys (Kochenderfer-Ladd & Skinner, 2002; Shelley & Craig, 2010) the current study may suggest gender-typed but adaptive coping strategies for cyberhate among adolescents.

In terms of age, the present finding with regards to Technical coping amongst younger adolescents was not mirrored in the literature on cyberbullying nor expected in line with developmental theories (Steinberg, 2011). On the contrary, some earlier findings indicated that responses such as deleting messages and blocking the person were more prevalent among older adolescents with higher internet skill levels whilst younger adolescent were more likely to resort to more passive strategies such as 'stop using the internet' (Görzig & Machackova, 2016; Vandoninck et al., 2012). However, the younger participants from this study were below 12 years old, the youngest age in the current study. There is a possibility that the younger adolescents did not yet possess technological skills. Most other research on coping with cyberbullying report age differences related to social support seeking whereby younger adolescents were more likely to report talking to someone about the incidence (Skrzypiec et al., 2011) and a parent in particular (Livingstone et al., 2011; Perren et al., 2012; UK Safer Internet Centre, 2016). Those findings could not be corroborated in the current study, perhaps this is because of the slightly higher age of the lower age category in the present study compared to previous research. It may be that the youngest adolescents in the current study may have already entered a developmental stage of distancing themselves from parents and other adults (Steinberg, 2011) and were therefore less likely to talk to their

parents or another adult compared to previous studies using samples with a lower age range.

Regarding SES, the current finding in terms of Technical coping can be considered in relation to findings on coping with cyberbullying insofar as those with low SES were shown to be more likely to delete messages or block the perpetrator (Vandoninck et al., 2012). Other findings on coping with cyberbullying indicated that those with lower SES were also likely to speak to someone about the incident; however, the same study could not support the current findings in relation to Distal advice, with those from low SES being no more likely to speak to a teacher or another adult than other participants in the study (Livingstone et al., 2011). The current findings as well as those from previous research on cyberbullying are in contrast to the notion that those with lower SES would show less adaptive coping strategies (Glasscock et al., 2013; Iqbal & Nishat, 2017); in fact, they appear to be using the most effective coping strategies. It is possible that the social disadvantage amongst youth from low SES background has contributed to active resilience building and coping (Schoon, 2006). This notion is supported by the fact that among cyberbullying victims, those who belonged to a discriminated against group, with a disability or who spoke a minority language at home, i.e., those who were potentially subjected to cyberhate based on their group membership, more often sought support upon being victimized than victims from other groups (Livingstone et al., 2011).

Research comparing responses of victims with non-victims from online or cyberbullying is scarce. Perhaps in contrast to findings from the current study, there is some indication that victims of traditional and cyberbullying are more likely to use emotion related or passive coping strategies (DeHue, 2016) and that cybervictims compared to traditional victims are more likely to use Close support related strategies

(Völlink et al., 2013). However, the findings reported here corroborate the conceptual approach and previous empirical evidence employing routine activity theory in relation to hate speech (Costello et al., 2017; Hawdon, Costello et al., 2017). The current findings support the indication that target suitability for the reception of hate speech may increase amongst those who engage in antagonistic online activities themselves, such as retaliation. However, we note that from a theoretical perspective we would not expect that victimization triggers antagonistic behaviors but the reverse causality; that is, antagonistic behaviors enhance victimization probability. This notion is consistent with previous findings on cyberbullying showing that antagonistic behaviors such as retaliation are more likely amongst bully-victims than those who were victims only (Hasenbrink, Görzig, Haddon, Kalmus & Livingstone, 2011).

4.4. Limitations and outlook on future research

Although the present study addresses important gaps in the cyberhate literature, it has several limitations that need to be mentioned. While our sample is large, it cannot be considered as representative for German adolescents. To increase the generalizability of our results, follow-up research will need to be completed based on diverse samples, including ones that vary by national origin, educational level, sexual identity, or racial/ethnic group. Furthermore, cross-cultural studies are needed to understand whether adolescents from varying cultures use different coping strategies to deal with cyberhate. This research might be especially important in regard to the development of prevention and intervention programs and the inter-cultural validity of such programs. Our investigation of cyberhate is based on what adolescents perceive as cyberhate. Our measurement of cyberhate is based on subjective rather than objective definition; adolescents might differ in how they classify online content as cyberhate and what they judge as mean or threatening. While controversial in some ways, providing a definition

of cyberhate to participants does have the potential to increase response validity. More research is needed to create a more objective definition of cyberhate according to adolescents. While we considered a wide range of coping strategies in the present study, we did not include items to measure ignoring cyberhate. However, ignoring might be an often used strategy by adolescents as has been shown by initial research on coping with cyberhate (UK Safer Internet Centre, 2016). Follow-up research should also include ignoring the cyberhate incident as another possible coping strategy with cyberhate. Future research should also investigate whether varying coping strategies can buffer or worsen possible effects of cyberhate victimization as it has been shown for other forms of cybervictimization.

5. Conclusion

The present study was one of the first to investigate a) psychometric properties of a multidimensional research tool for the measurement of coping strategies with cyberhate; b) the frequency rates of each coping strategy; and c) sociodemographic differences in coping strategies used by adolescents. We found a model with six correlated factors, namely Distal advice, Assertiveness, Helplessness/ Self-blame, Close support, Technical coping, and Retaliation, that yielded satisfactory fit indices. Our findings are somewhat encouraging because adolescents reported to use more constructive coping strategies, such as Technical coping, Assertiveness, and Close support. Girls reported more frequently using all coping strategies, except for Retaliation. Younger adolescents reported more often using Technical coping than older adolescents. Distal advice and Technical coping were higher among participants with lower SES compared with adolescents with higher SES. Distal advice and Close support were higher for non-victims, whereas the mean of Retaliation was higher for victims.

The findings of this study underscore the importance of adolescents, school staff, policy makers, and parents to be well-informed of cyberhate. More cross-cultural research is needed to understand potential differences in the use of coping strategies across different cultures and whether specific coping strategies buffer the negative impact of cyberhate victimization.

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Table 1

Frequencies of demographic variables by grade, sex, and socioeconomic status.

FAS	Sex	Grade									
		7 th		8 th		9 th		10 th		Total	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
High FAS	Girls	77	28.9	85	32	62	23.3	42	15.8	266	100
	Boys	62	28.6	81	37.3	49	22.6	25	11.5	217	100
Average FAS	Girls	77	33.6	55	24	53	23.1	44	19.2	229	100
	Boys	63	25.7	74	30.2	63	25.7	45	18.4	245	100
Low FAS	Girls	63	27.6	53	23.2	70	30.7	42	18.4	228	100
	Boys	82	32.7	63	25.1	67	26.7	39	15.5	251	100
Total		424	29.5	411	28.6	364	25.3	237	16.5	1436	100

Note. Discrepancy between total and sample size is due to missing data ($n = 44$) for FAS. FAS = Family affluence scale.

Table 2.

Goodness-of-fit of the Estimated Models.

	χ^2	<i>df</i>	NNFI	CFI	SRMR	RMSEA
<i>Model 1.</i> Proposed theoretical model (six correlated factors)	895.22	155	.94	.95	.057	.061, 90% CI [.057, .065]
<i>Model 2.</i> A single factor of "coping with cyberhate"	5085.80	170	.63	.67	.12	.145, 90% CI [.147, .154]
<i>Model 3.</i> Six uncorrelated factors	3041.98	170	.78	.81	.29	.115, 90% CI [.112, .119]
<i>Model 4.</i> Null model	12212.17	170	.09	.18	.36	.236, 90% CI [.232, .239]

Table 3

Frequencies of coping actions.

Item Name	Item Label	Answer Options							
		Definitely not		Probably Not		Probably		Definitely	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
DA 1	...go to the police	536	38.3	381	25.7	294	19.9	190	13.6
DA 2	...inform a teacher or the principal	739	53.1	377	27.1	200	14.4	77	5.2
DA 3	...call a helpline	948	68.2	317	22.8	92	6.6	33	2.4
AS 1	...let the person know that I do not find it funny at all	383	27.5	179	12.9	382	27.5	447	32.1
AS 2	...let the person know that his behavior is not acceptable at all	339	24.4	152	11	385	27.8	511	34.5
AS 3	...tell the person to stop it	286	20.5	143	10.3	346	24.9	617	44.3
AS 4	...ask the person why he/she is doing this	448	32.3	293	19.8	329	23.8	315	22.7
HS 1	...be completely desperate	829	59.9	301	21.7	146	10.5	108	7.8
HS 2	...ask myself why this happened to me	663	47.8	299	21.6	267	19.3	158	11.4
HS 3	...not know what to do	797	57.7	324	23.5	173	12.5	87	6.3
CS 1	...talk to my friends because it's good for me	428	31	180	13	388	28.1	384	27.8
CS 2	...go to someone who listens to me and comforts me	491	35.6	236	17.1	297	21.5	357	25.8
CS 3	...spend time with my friends to take my mind off it	383	27.7	191	13.8	361	26.1	447	32.3
CS 4	...talk to my parents and ask for their advice*	505	36.6	217	15.7	256	18.6	402	29.1

TC 1	...pay more attention to who gets access to my data	353	25.6	188	13.6	313	22.7	525	38.1
TC 2	...block that person so that he/she cannot contact me anymore	259	18.7	94	6.8	178	12.7	858	61.9
TC 3	...save messages/pictures as evidence (e.g., copies or screenshots)	337	24.4	172	12.4	288	20.8	586	42.4
RET 1	...get back at the person with the help of friends in cyber space (e.g., text message, email)	658	47.6	356	25.8	168	12.2	200	14.5
RET 2	... insult the person in cyber space (e.g., text message, email)	804	58.1	292	21.1	144	10.4	145	10.5
RET 3	... do it back.	866	62.6	262	18.9	109	7.9	146	10.6

Notes: DA = Distal advice; AS = Assertiveness; HS = Helplessness/ Self-blame; CS = Close support; TC = Technical coping; RE = Retaliation. * One item was added to the original instrument.

Table 4.

Medium scores of each scale obtained from testing the invariance of intercepts as a function of those variables.

	Sex		Grade		SES		Victim status					
	Girls	Boys	Z statistics (robust SE)	7 th and 8 th grades	9 th and 10 th grades	Z statistics (robust SE)	Lower SES	Higher SES	Z statistics (robust SE)	Victims	Non- Victims	Z statistics (robust SE)
Distal advice	0.87 (0.73)	0.64 (0.68)	6.29 (.042)***	0.77 (0.71)	0.73 (0.73)	0.48 (0.43)	0.80 (0.72)	0.72 (0.71)	-2.24* (.42)	0.58 (0.65)	0.79 (0.73)	-4.32 (.059)***
Assertiveness	1.94 (0.92)	1.41 (1.08)	11.30 (.051)***	1.65 (1.06)	1.71 (1.01)	-1.86 (0.06)	1.72 (1.04)	1.66 (1.04)	-.78 (.054)	1.58 (1.06)	1.70 (1.03)	-1.37 (0.79)
Helplessness/ Self-blame	0.99 (0.91)	0.53 (0.72)	10.82 (.044)***	0.80 (0.85)	0.71 (0.86)	1.52 (0.05)	0.81 (0.88)	0.73 (0.83)	-1.83 (.044)	0.80 (0.86)	0.75 (0.85)	.056 (.064)
Close support	1.83 (0.92)	1.14 (0.97)	15.14 (.049)***	1.46 (1.02)	1.51 (0.99)	-1.37 (.05)	1.52 (0.98)	1.46 (1.03)	-1.08 (0.52)	1.35 (0.98)	1.51 (1.01)	2.17 (.073)*
Technical coping	2.20 (0.87)	1.62 (1.12)	11.94 (.048)***	1.87 (1.07)	1.97 (1.00)	-2.47* (.053)	2.00 (1.02)	1.83 (1.04)	-3.00 (.052)**	1.81 (1.06)	1.93 (1.04)	-1.22 (.076)

Retaliation	0.74	0.81	-1.39	0.77	0.79	-0.55	0.78	0.79	-.032	0.92	0.75	2.90
	(0.86)	(0.95)	(0.48)	(0.90)	(0.92)	(0.05)	(0.90)	(0.92)	(.049)	(0.95)	(0.89)	(.071)**

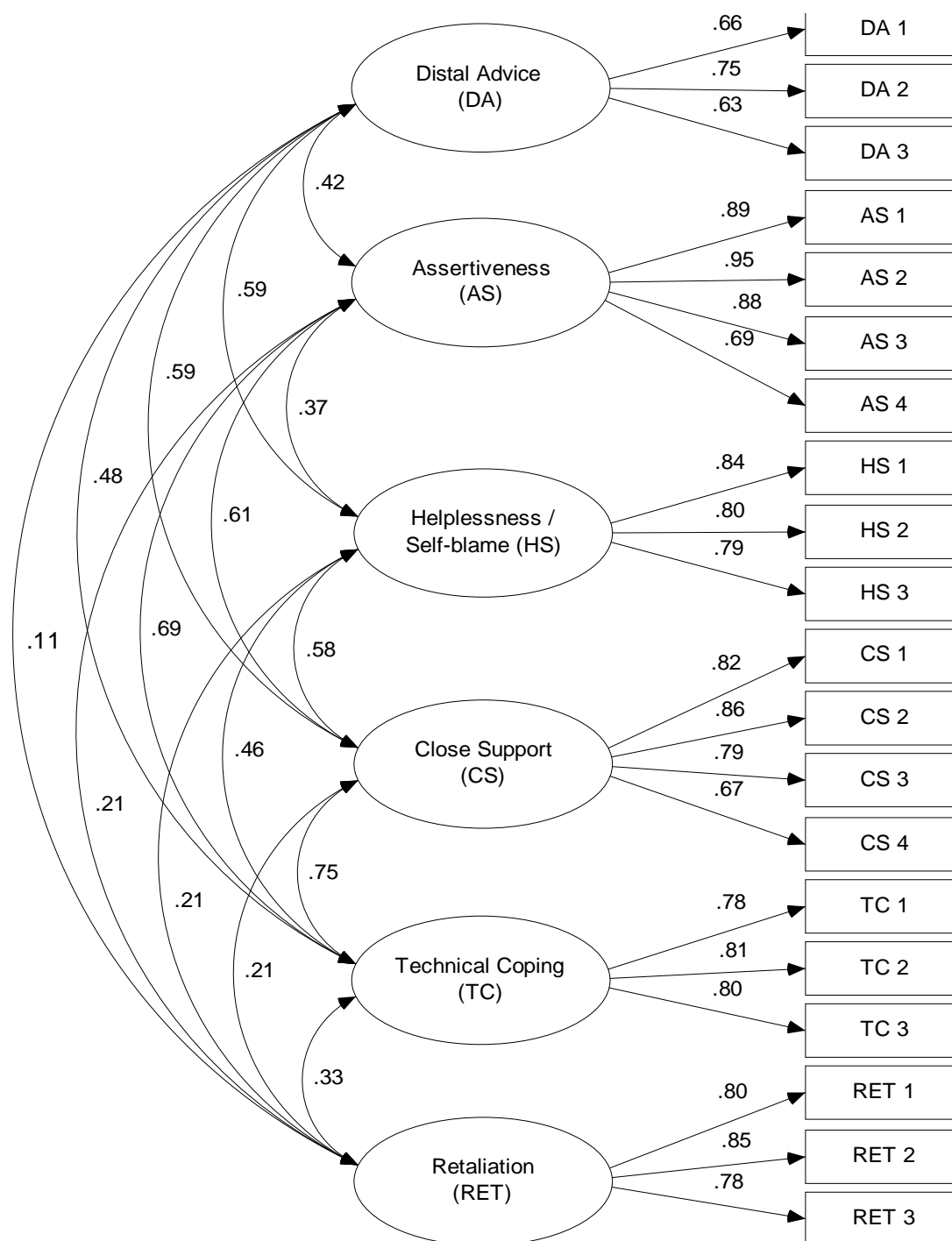


Figure 1. Confirmatory factor analysis for the Coping with Cyberhate Questionnaire. Note. For all factor loadings the level of significance was $p < .001$. For correlations among latent variables the significance was $p < .001$, except for the relationship between Distal Advice and Retaliation ($p < .05$).