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The effects of group centrality and accountability on conformity to cyber aggressive norms: Two messaging app experiments

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ABSTRACT

Cyber aggression in messaging apps often involves a group-based process of conformity to aggressive norms. To date, no empirical research has investigated this psychological process and its determinants. Therefore, this study reports two experiments that examined the effects of group centrality (the subjective importance of a social group) and accountability (being accountable for one’s actions) on conformity to cyber aggressive norms. Additionally, the moderating role of susceptibility to peer pressure was examined. The experiments included a scripted WhatsApp conversation in which participants judged the appropriateness of cyber aggressive behaviors after viewing ostensible peers’ responses. The results of Experiment 1 (N = 233,Mage = 13.19) were replicated in Experiment 2 (N = 296, Mage = 12.67), which had an improved method addressing the limitations of Experiment 1. Accountability affected conformity to cyber aggressive norms (Experiment 1: f = .18, p = .016; Experiment 2: f = .13, p = .041): Adolescents who did not think they had to discuss their responses in class conformed more than those who did. However, no effect of group centrality or moderating effects of susceptibility to peer pressure were found. This study extends conformity research to messaging apps. The findings suggest that increasing accountability in messaging apps may be a viable strategy for intervention efforts to reduce conformity to cyber aggression.

1. Introduction

Mobile messaging apps have become omnipresent in the daily lives of children and adolescents (Aizenkot, 2020; van Driel, Pouwels, Beyens, Keijsers, & Valkenburg, 2019). The most popular mobile messaging app, WhatsApp, had two billion monthly users worldwide in October 2020 (Statista, 2020). WhatsApp enables one-on-one communication as well as group-communication between multiple users in a messaging group. It allows for the exchange of textual, visual, and audiovisual content, along with synchronous audio (visual) communication (Karapanos, Teixeira, & Gouveia, 2016; Waterloo, Baumgartner, Peter, & Valkenburg, 2018). WhatsApp is particularly popular among early adolescents, who use the messaging app as a primary medium to manage their social interactions (Aizenkot, 2020; Aizenkot & Kashy-Rosenbaum, 2018).

Problematic to the rising popularity of mobile messaging apps such as WhatsApp is that cyber aggression has also become a part of the daily interactions of many adolescents (Aizenkot, 2020; Hinduja & Patchin, 2019; Piccoli, Carnaghi, Grassi, Stragã, & Bianchi, 2020). Cyber aggressive behaviors, such as impersonation, nonconsensual image sharing, and social exclusion (Cohen-Almogar, 2018; Hinduja & Patchin, 2019), frequently occur on messaging apps like WhatsApp (Aizenkot, 2020; Aizenkot & Kashy-Rosenbaum, 2018). These cyber aggressive behaviors are often group-based (Aizenkot, 2020; Aizenkot & Kashy-Rosenbaum, 2018), where adolescents go along with the behaviors of their peers (Aizenkot, 2020), such as when a private picture of a peer is forwarded among members of a WhatsApp group (Aizenkot & Kashy-Rosenbaum, 2018).

As of yet, empirical research in the domain of cyber aggression has not causally tested the psychological determinants of group-based conformity to cyber aggressive norms in these exceptionally popular messaging apps. It is important to examine these determinants to be able to identify potential target mechanisms for applied interventions to reduce cyber aggression. These interventions may eventually help increase adolescents’ resilience to harmful peer-to-peer behaviors. This study is the first to causally test these psychological determinants in early adolescents’ messaging apps. In doing so, we chose to focus on
cyber aggressive norms. We had two reasons for doing this. First, cyber aggression is broadly defined as negative peer-to-peer behaviors, whereas cyberbullying is more narrowly defined as negative peer-to-peer behaviors that are repetitive (Corcoran, Guckin, & Prentice, 2015). Cyber aggression, therefore, also includes incidental behaviors that can nonetheless have a detrimental impact on early adolescents. For example, a compromising image that is shared a single time can potentially exist in perpetuity and could, thus, have a lasting impact on a victim (Runions & Bak, 2015). Second, group behavior is often normative, meaning that group norms (i.e., the attitudes and behaviors that characterize a social group) shape people’s inclinations to engage in behavior (Hogg & Reid, 2006). Cyber aggression research has shown that norms concerning cyber aggression strongly predict engagement in cyber aggression (for a review, see Piccoli et al., 2020). Cyber aggressive norms, therefore, are a meaningful proxy for actual cyber aggressive behavior (which is challenging to manipulate or measure in experimental studies).

Two potential psychological determinants of group-based conformity to cyber aggressive norms emerge from the social influence literature. The first determinant, group centrality, pertains to the subjective importance of a social group. People have the tendency to conform to group norms and behaviors (Ash, 1956; Brechwald & Prinstein, 2011; Wijenayake, van Berkel, Kostakos, & Goncalves, 2020), and the subjective importance of a social group influences the extent to which people conform. Earlier research in the context of the messaging app WhatsApp showed that group centrality (Cameron, 2004; Luhtanen & Crocker, 1992), is positively associated with conformity to cyber aggression among adolescents (Bleize, Tanis, Anschütz, & Buijzen, 2021). The second determinant, accountability, pertains to being held accountable for one’s actions by people outside of one’s own social group. Lack of accountability to people outside of one’s own social group may enhance conformity to peer group norms (McGuire, Rutland, & Nesdale, 2015). The privacy of messaging app groups (Karapanos et al., 2016; Watertoo et al., 2018) may induce such a lack of accountability (Aizenkot, 2020), which can subsequently increase conformity to cyber aggressive norms in messaging app groups.

It is especially important to examine the effects of group centrality and accountability on conformity to cyber aggressive norms in messaging apps among early adolescents (ages 12–15), because these adolescents are particularly susceptible to peer influence (Brechwald & Prinstein, 2011). Therefore, the current study involved two preregistered experiments testing the causal effects of these two determinants on conformity to cyber aggressive norms among adolescents in the first three grades of secondary school in The Netherlands. Additionally, the experiments examined whether these effects were moderated by individual differences in susceptibility to peer pressure. Below, we review the literature to come to four specific hypotheses regarding the main and combined effects of group centrality and accountability, and the moderating influence of susceptibility to peer pressure.

1.1. The effect of group centrality

The first determinant under investigation, group centrality, refers to the salience and subjective importance of a social group to a person’s self-concept (Cameron, 2004; Leach et al., 2008; Luhtanen & Crocker, 1992). Previous research has identified group centrality as a potential predictor of conformity to cyber aggression on WhatsApp (Bleize et al., 2021). Group centrality is a component of the more general concept of social identification, that describes the extent to which people cognitively and affectively identify with a social group (Leach et al., 2008). The Social Identity (SI) perspective (Tajfel & Turner, 1979; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) describes how social identification relates to group behavior. In doing so, it first distinguishes between personal and social identity: Personal identity refers to the idiosyncratic characteristics that differentiate group members from others, whereas social identity refers to group characteristics shared among members of a social group. The SI perspective proposes that when people are part of a social group, a shift in focus may arise from their personal identity to their social identity (Hogg, Abrams, & Brewer, 2017; Tajfel & Turner, 1979). This shift in focus then causes people to think of themselves and others less in terms of their idiosyncratic characteristics, and more in terms of their shared social identity together with the norms and behaviors that accompany this social identity. As a result of this identity shift, people typically identify more strongly with their social group (Hogg & Reid, 2006; Turner et al., 1987).

Previous group conformity research has shown that social identification increases conformity to group norms (Hogg & Reid, 2006; Tajfel & Turner, 1979; Turner et al., 1987). The more people identify with a social group, the more likely they thus are to adhere to group norms. For example, Lee (2006, 2007) asked participants to give their opinion about several hypothetical scenarios both during and after an interaction with ostensible group members (whose opinions were, in fact, computer-programmed). Group conformity was measured as the extent to which participants’ post-interaction opinions had shifted in the direction of the group norm. Results showed a positive relation between group identification and group conformity. Likewise, a similar study by Kim and Park (2011), in which group conformity was measured by asking participants to self-report their intentions to conform, showed that group identification increased participants’ self-reported conformity intentions.

With regard to conformity to cyber aggressive behaviors during adolescence in particular, studies have shown that adolescents are more likely to go along with aggressive behaviors of close peer, like friends, than of distant peers, like acquaintances (Bastiaensens et al., 2014; Duffy & Nesdale, 2009; Oh & Hazler, 2009; Piccoli et al., 2020). Generally, groups that consist of strong social ties such as friends, are perceived as high in group centrality (Lickel et al., 2000; Sviridzenka, Saní, & Bennett, 2010). This means that these groups are typically perceived as highly important by their group members. Contrarily, groups that consist of weaker social ties, such as acquaintances, are perceived as low in group centrality (Lickel et al., 2000; Sviridzenka et al., 2010). Recent cross-sectional work specifically focused on the relation between the different components of social identification and conformity to cyber aggression in WhatsApp groups, and suggests that particularly the group centrality component of social identification is positively related to conformity to cyber aggression on WhatsApp (Bleize et al., 2021).

Group centrality may be a potential determinant of conformity to cyber aggression because conformity to risk behaviors is often group-based, and groups high in group centrality are likely to induce more conformity than those low in group centrality. It is, therefore, important to examine the causal effect of group centrality on conformity in messaging apps. Drawing on previous empirical work, we expect that, in the context of messaging app groups, conformity is higher in high centrality WhatsApp groups that consist of strong ties, versus low centrality WhatsApp groups that consist of weak ties. This leads to the first hypothesis:

H1 High group centrality leads to higher conformity to cyber aggressive norms on WhatsApp than low group centrality.

1.2. The effect of accountability

The second determinant, accountability, refers to the expectation that people will have to justify their actions to others (Tetlock, 1983; Tetlock, Skitka, & Boettger, 1989). Accountability is considered to influence people’s behavior because it causes them to think about their actions more carefully (Dosher & Crano, 2001; Tetlock, 1983). Not being accountable to people outside of one’s own social group increases conformity to the norms and behaviors of the group (McGuire et al., 2015). Having to defend one’s behavior to people outside of the group, however, may attenuate group conformity, particularly when the behavior is disapproved of or under threat of punishment by people outside of the group (Reicher & Levine, 1994). Early adolescents’ messaging groups
may differ in the extent to which adolescents are accountable to people outside of their messaging group. Some messaging groups are not monitored by people outside of the group (Valkenburg & Piotrowski, 2017; Waterloo et al., 2018) while other messaging groups are, for example, monitored by parents who seek to mediate their child’s media use (Paus-Hasebrink, Kulterer, & Sinner, 2019). Thus, messaging groups may differ with respect to accountability to people outside of the group.

Studies have found that aggressive peer behaviors, both in offline and online contexts, occur more frequently when perpetrators are not held accountable for their behaviors (Cross et al., 2015; Mason, 2008; McGuire et al., 2015). For example, McGuire et al. (2015) examined children’s intergroup attitudes and showed that when the peer group supported a norm of social exclusion (“You can’t like or be friendly to any members of the other team”), children indicated to dislike people outside of their peer group. This effect was strongest when children were not accountable to others (i.e., their judgments remained confidential). Moreover, research has shown that not being accountable increases the likelihood of actual cyberbullying behaviors (Cross et al., 2015; Mason, 2008).

As lack of accountability may increase conformity to aggressive peer behaviors, it is important to examine its potential causal effect on conformity in messaging apps. We expect that conformity to cyber aggressive norms is higher when there is no accountability to people outside of the group versus when there is accountability. This leads to the second hypothesis:

H2 No accountability to people outside of a WhatsApp group leads to higher conformity to cyber aggressive norms on WhatsApp than accountability to people outside of a WhatsApp group.

Because high group centrality and unaccountability are expected to both increase conformity, whereas low group centrality and accountability are expected to both decrease conformity, we additionally expect a cumulative effect of group centrality and accountability on conformity to cyber aggressive norms. More specifically, we expect that conformity will be highest when there is a combination of high group centrality and no accountability, and lowest when there is a combination of low group centrality and accountability. This leads to the third hypothesis:

H3 The combination of high group centrality and no accountability leads to highest conformity to cyber aggressive norms, whereas the combination of low group centrality and accountability leads to lowest conformity to cyber aggressive norms.

1.3. The moderating effect of susceptibility to peer pressure

Finally, we expect the hypothesized effects to be moderated by individual differences in susceptibility to peer pressure. Adolescents substantially shape each other’s attitudes and behaviors (Brechwald & Prinstein, 2011). During adolescence, important socio-emotional goals are becoming autonomous, developing a stable identity, and managing social relationships with peers (Steinberg & Monahan, 2007; Valkenburg & Piotrowski, 2017). For early adolescents especially, it becomes tremendously important to belong to peer groups in order to attain these developmental goals (Brechwald & Prinstein, 2011), because social recognition from peers is rewarding and increases self-esteem (Tarrant, MacKenzie, & Hewitt, 2006). However, individual differences in social-cognitive development and, with that, executive functioning skills, make some early adolescents more susceptible to peer influence than others (Brechwald & Prinstein, 2011).

Susceptibility to peer pressure may strengthen the effects of group centrality and accountability for adolescents with higher levels of susceptibility to peer pressure versus those with lower levels of susceptibility to peer pressure (Brechwald & Prinstein, 2011). Adolescents who are more receptive to peer conceptions are more likely to conform to high centrality groups than to low centrality groups, because it is rewarding to receive social recognition from close peers (Tarrant et al., 2006). Likewise, these adolescents are more likely to conform when they are not accountable to people outside of their group, because no accountability makes the norms of the peer group more salient (McGuire et al., 2015). This leads to the fourth and final hypothesis:

H4 The previously hypothesized main and combined effects of group centrality and accountability on conformity to cyber aggressive norms, are stronger for adolescents with higher levels of susceptibility to peer pressure than for those with lower levels of susceptibility to peer pressure.

2. Experiment 1

2.1. Method

The experiment had ethical approval of the Institutional Review Board of the principle author’s home institution. Data management was in line with the protocol of this institution. The preregistration and anonymized data of the experiment are available on the Open Science Framework (OSF, https://bit.ly/3bvsh0).

2.1.1. Design

The experiment consisted of a scripted conversation about behaviors on social media. In the conversation, participants judged the appropriateness of several cyber aggressive social media behaviors after first viewing ostensible peers’ judgments about these behaviors. The experiment had a 2 (Group Centrality: High, Low) x 2 (Accountability: Accountability, No Accountability) factorial between-subjects design, with four experimental conditions.

Additionally, a baseline group was added in which participants judged the appropriateness of the cyber aggressive social media behaviors individually without first viewing ostensible peer judgments. This baseline group, thus, provided uninfluenced scores on the appropriateness of the cyber aggressive social media behaviors, which were subsequently used to check whether viewing ostensible peers’ judgments influenced participants’ scores, regardless of their specific experimental condition. This would indicate whether the scripted conversation was a suitable paradigm to test conformity to cyber aggressive norms.

2.1.2. Participants

The original sample consisted of 286 early adolescents. As preregistered, we excluded participants who did not complete the experiment (n = 16), who identified the purpose of the experiment (n = 24), or who failed both manipulation checks for the experimental manipulations (see measures section, n = 13). Thus, the final sample consisted of 233 participants (53.6% female, 45.1% male, 1.3% did not specify) with an age range from 11 to 15 years old (M = 13.19, SD = 0.91), of which 180 were in the experimental conditions, and 53 were in the baseline group. The majority of participants (95.7%) were born in The Netherlands and all participants were fluent in Dutch. We conducted the experiment at secondary schools in the Netherlands, which we recruited through information letters and phone calls. In return for participation, we provided workshops on social media netiquette (i.e., how to communicate appropriately on social media) for the schools’ students. Participants came from each of three main education levels that are distinguished in the Dutch secondary school system; preparatory vocational secondary education (10.7%), senior general secondary education (17.2%), and preparatory university secondary education (71.2%). Schools, legal guardians, and participants provided consent prior to data collection.

2.1.3. Procedure

Participants completed the experiment in one in-class session on a laptop or desktop PC. They sat at their assigned desk with space between desks. The session lasted approximately 30 min and was divided into three parts. First, participants answered demographic questions (e.g., age, sex, educational level) and provided the names of the classmates that were most important to them, which were used for the group centrality manipulation. Second, participants were led to believe that they
were assigned to a group with three peers with whom they would have a conversation about social media behaviors. They were instructed to do this by indicating how appropriate they thought several social media behaviors were. In reality, this conversation was scripted, in that the ostensible peers’ responses were preprogrammed. The conversation took place in an online environment that was visually similar to WhatsApp (see Fig. 1).

The scripted conversation consisted of 18 behaviors, of which 12 were “target” behaviors about cyber aggression (e.g., “Ignore a classmate online”), and 6 were “filler” behaviors about general social media behavior (e.g., “Send an instant-message to a classmate while you’re on the train”). The behaviors were presented to participants automatically and in a random order. Before participants provided their responses, they viewed the responses of the three ostensible peers. We preprogrammed these responses such that they indicated that the cyber aggressive behaviors were appropriate (scores varying from 4 to 6 on a 6-point scale with 1 as [completely inappropriate] and 6 as [completely appropriate]). The group norm was thus consistently manipulated to be positive towards cyber aggression. To increase the credibility of the ostensible peer’s responses in the structured conversation, ostensible peer’s responses to the filler behaviors included scores from the lower side of the 6-point scale as well. Responses were presented with a few seconds of delay to simulate a real conversation.

In the third part, participants answered questions that served as manipulation checks for the experimental manipulations, and questions about their WhatsApp use and susceptibility to peer pressure. Participants were debriefed at the end of the session.

2.1.4. Experimental manipulations

**Group centrality.** Group centrality was manipulated by ostensibly assigning participants to a group with three classmates, forming either a high or a low centrality group based on the classmates that participants identified as most important to them. More specifically, prior to the group assignment, participants answered three questions that tapped into the centrality dimension of social identification (Cameron, 2004; Leach et al., 2008): “Which group of classmates that you belong to do you often think about?”, “Which group of classmates that you belong to is an important part of who you are?”, and “Which group of classmates that you belong to is important for how you see yourself?”. We prompted participants explicitly to think about a group of classmates, taking the group rather than the individual as reference point. Participants provided the names of the classmates’ in the group that was most important to them. To manipulate centrality, prior to the structured conversation they were shown one of two messages: “You are assigned to a group that includes classmates from the group that you considered important to you” for high group centrality, or “You are assigned to a group that does not include classmates from the group that you considered important to you” for low group centrality.

**Accountability.** Following procedures from previous research (Dobbs & Crano, 2001; Kaikati, Torrelli, Winterich, & Rodas, 2017; Lerner & Tetlock, 1999), accountability was manipulated by displaying one of two messages at the start of the structured conversation: “You have to discuss your responses in class after the following conversation” for accountability, and “You do not have to discuss your responses in class after the following conversation” for no accountability.

2.1.5. Measures

2.1.5.1. Outcome variable. Conformity to norms on cyber aggression. We operationalized conformity to cyber aggression on WhatsApp as conformity to cyber aggressive group norms. Due to the sensitive nature of cyber aggressive behaviors, it was potentially unethical to lead participants to believe that their peers vigorously engaged in actual acts of cyber aggression. Manipulating the ostensible peers’ norms, however, was both more plausible and ethical and, thus, would be a good proxy for testing conformity to cyber aggression within our WhatsApp paradigm.

To measure conformity to norms on cyber aggression, we examined whether participants used the ostensible classmates’ responses as anchors in their own answers. We used 12 items of the Cybervictimization Questionnaire (CYVIC, Álvarez-García, Núñez, Barreiro-Collazo, & García, 2017), which reflect four types of cyber aggression: impersonation (i.e., pretending to be someone else), visual (i.e., photos and videos), written-verbal (i.e., phone calls and comments), and social exclusion (Menesi et al., 2012; Álvarez-García et al., 2017). The CYVIC has been validated among adolescents by Álvarez-García et al. (2017) and was recently used in previous research (Álvarez-García, Núñez, González-Castro, Rodríguez, & Cerezo, 2019; Álvarez-García, Núñez, Pérez-Fuentes, & Núñez, 2020). The original CYVIC consists of 15 items, but we excluded 3 items that were about cyber aggression in phone calls. As a result, there were 3 items to assess conformity to norms on each specific type of cyber aggressive behavior. All items were preceded by the question “To what extent do you think this is appropriate?”. Example items were “Impersonating a classmate online, as if you are that classmate” (impersonation), “Taking and disseminating an embarrassing photo of a video of a classmate without his or her permission” (visual), “Make fun of a classmate by making an offensive comment” (written-verbal), and “Not including a classmate in an online group or not letting him/her join a conversation” (social exclusion; see Table 1 for a full list of all items).

![Fig. 1. Example of the WhatsApp environment used in the experiment.](image-url)
Table 1 Items used to assess conformity to norms on cyber aggression, susceptibility to peer pressure, perceived group centrality, and perceived accountability.

| Items                                                                 | Response categories                                                                 | Reliability |
|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------|
| Conformity to norms on cyber aggression                               | - Impersonation                                                                     |             |
|                                                                       | - Creating a fake profile of a classmate to ridicule him or her                     |             |
|                                                                       | - Impersonating a classmate and sending nasty messages to someone else, as if that classmate is the one doing it |             |
|                                                                       | - Visal                                                                              |             |
|                                                                       | - Taking and disseminating an embarrassing photo of a classmate without his or her permission |             |
|                                                                       | - Forwarding an embarrassing photo or picture of a classmate without his or her permission |             |
|                                                                       | - Persuading a classmate to do something by threatening to forward a private conversation or embarrassing photo of him or her if s/he doesn’t do it |             |
|                                                                       | - Written-Verbal                                                                    |             |
|                                                                       | - Make fun of a classmate by making an offensive comment                            |             |
|                                                                       | - Make insulting comments about a classmate online                                  |             |
|                                                                       | - Spread false rumors about a classmate online                                      |             |
|                                                                       | - Exclusion                                                                         |             |
|                                                                       | - Not including a classmate in an online group or not letting him/her join a conversation |             |
|                                                                       | - Say something untrue about a classmate in an online group, so he or she is excluded from the group |             |
|                                                                       | - Ignore a classmate online                                                         |             |
| Susceptibility to peer pressure                                        |                                                                                     |             |
|                                                                       | - My friends can push me into doing just about anything                             |             |
|                                                                       | - I give into peer pressure easily                                                  |             |
|                                                                       | - When at school, if a group of people asked me to do something, it would be hard to say no |             |
|                                                                       | - At times, I’ve broken rules because others have urged me to                       |             |
|                                                                       | - At times, I’ve done dangerous or foolish things because others dared me to         |             |
|                                                                       | - I often feel pressured to do things I wouldn’t normally do                        |             |
| Perceived group centrality                                             |                                                                                     |             |
|                                                                       | - I often think about the fact that I am a member of my group                       |             |
|                                                                       | - Being a member of my group is an important part of who I am                      |             |
|                                                                       | - Being a member of my group is important to how I see myself                       |             |
| Perceived accountability                                               |                                                                                     |             |
|                                                                       | - During the messaging app conversation                                             |             |
|                                                                       | - … I felt responsible for my answers                                               |             |
|                                                                       | - … I felt like I would later have to explain my answers                            |             |
|                                                                       | - … I felt like I would later have to justify my answers                           |             |
|                                                                       | - … I felt like I would later be held accountable for my answers                    |             |

After viewing the ostensible peers’ responses, participants indicated to what extent they thought that each behavior was appropriate (response categories ranging from 1 [very inappropriate] to 6 [very appropriate]). We computed a difference score using the absolute difference between the participants’ score, and the average score of the ostensible classmates’ responses (which ranged between 4.67 and 5.33).

A higher difference score would then indicate more distance between the participants’ response and the average score of the ostensible classmates’, and thus less conformity, whereas a lower difference score would indicate less distance between the participants’ score and the average score of the classmates, and thus more conformity. To facilitate the interpretation of the results, however, scores were reversed such that higher scores indicated more conformity. The 12 items had good reliability (Cronbach’s $\alpha = .91, M = 1.65, SD = 0.84$, scores ranged between 0.19 and 3.50).

2.1.5.2. Moderator variable. Susceptibility to peer pressure. To measure susceptibility to peer pressure, we used Santor et al.’s (2006) 6-item peer pressure scale. This scale has been validated by Santor, Messervey, and Kusumakar (2000) and was recently used in previous research (Ong, Newman, Buhs, & Shell, 2018). An example item was “My friends can push me into doing just about anything”. Response categories ranged from 1 (completely disagree) to 6 (completely agree). The 6 items had acceptable reliability ($\alpha = .75, M = 2.33, SD = 0.81$).

2.1.5.3. Manipulation checks. Two continuous manipulation checks assessed whether the experimental manipulations increased participants’ perceived group centrality and accountability.

Perceived group centrality. To check whether the group centrality manipulation influenced perceived group centrality, we used the three items reflecting the centrality component of Leach et al.’s (2008) 14-item social identification scale. This scale has been validated by Leach et al. (2008) and was recently used in previous research (Crane, Louis, Phillips, Amiot, & Steffens, 2018). The items were adapted to refer to participants’ WhatsApp group. An example item was “The classmates that were in my messaging group are an important part of who I am”. Response categories ranged from 1 (completely disagree) to 6 (completely agree). The 3 items had good reliability ($\alpha = .94, M = 2.76, SD = 1.57$).

Perceived accountability. To check whether the accountability manipulation influenced perceived accountability, we used 4 items from Hochwarter et al.’s (2003) perceived accountability scale. This scale has been validated by Hochwarter, Kacmar, and Ferris (2003) and was recently used in previous research (Hall & Ferris, 2011) An example item is “During the messaging app conversation I felt responsible for my answers”. The response categories ranged from 1 (completely disagree) to 6 (completely agree). The 4 items had acceptable reliability ($\alpha = .70$), but we excluded the first item ($M = 2.78, SD = 1.31$) because this considerably improved reliability ($\alpha = .80$).

2.1.5.4. Control variables. We measured demographics and WhatsApp use as potential control variables. Participants’ sex (male, female, or “I’d rather not say”), age, educational level (preparatory vocational secondary education, senior general secondary education, or preparatory university secondary education), and school year (first, second, or third) were assessed. We also asked participants how many days per week (one to seven) and hours per day (ranging from 1 [less than half an hour per day] to 9 [more than 7 h per day]) they used WhatsApp, and how many WhatsApp groups they were a member of (ranging from 1 [1 to 5 groups] to 7 [more than 30 groups]). Moreover, we asked participants to indicate which group they were assigned to and whether they would have to discuss their responses after the conversation, which we used as exclusion criteria (see preregistration).

2.1.6. Data analysis

We conducted the analyses in SPSS (Version 25.0). We handled missing data with pairwise deletion. First, we conducted preparatory analyses. Zero-order correlations examined relations between the outcome variable and potential covariates. Conformity to norms on cyber aggression was positively skewed, thus, we used Spearman’s rank-order correlations. Randomization checks included a one-way ANOVA test and chi-square tests; these examined whether the experimental conditions and the baseline group were comparable in terms of age, sex, and educational level. We then conducted a one-way ANOVA test to examine whether the raw scores on the social media behaviors (i.e., the scores that participants gave in the conversation, not their difference scores) of participants in the experimental conditions differed significantly from those in the baseline group, which provided insight into the general influence of viewing peers’ responses, regardless of the experimental condition participants were assigned to. Moreover, we conducted independent-samples t-tests as manipulation checks to test whether perceived group centrality was higher in the high group centrality than in the low group centrality condition, and whether perceived accountability was higher in the accountability condition than in the no accountability condition.

Second, the main analyses tested differences between the four experimental conditions. We preregistered that the main analysis would involve a 2 (Group Centrality: High, Low) x 2 (Accountability: Accountability, No Accountability) x 2 (Susceptibility to Peer Pressure: High, Low) between-subjects ANOVA (or ANCOVA in case of significant covariates). However, this required the moderator variable
(susceptibility to peer pressure) to be dichotomized using a median-split procedure, which subsequently results in loss of power (Aiken, West, & Reno, 1991). Therefore, we conducted a 2 (Group Centrality: High, Low) x 2 (Accountability: Accountability, No Accountability) between-subjects ANOVA to test the main effects (Hypothesis 1 and 2) and the combination of the main effects (Hypothesis 3), and complemented this with regression analyses to test the moderating effects of susceptibility to peer pressure (Hypothesis 4).

2.2. Results

2.2.1. Preparatory analyses

Descriptive analyses showed that most participants (98.7%) used WhatsApp. Of these, 99.1% belonged to at least one group on WhatsApp. Participants most often belonged to 6 to 10 groups (36.0%), followed by 1–5 groups (21.5%), 11 to 15 groups (16.7%), 16 to 20 groups (11.2%), 21 to 25 groups (5.2%), more than 30 groups (8.2%), and 26 to 30 groups (1.2%). Of all participants, 86.3% used WhatsApp every day of the week, 7.7% used WhatsApp 6 days of the week, and the remainder 2 to 5 days (9.1%), more than 5 days (5.6%), 21 to 25 groups (5.2%), more than 30 groups (8.2%), and 26 to 30 groups (1.2%).

2.2.2. Main analysis

The first hypothesis stated that high group centrality would lead to higher conformity to cyber aggressive norms on WhatsApp than low group centrality. The analysis yielded no statistically significant main effect of group centrality on conformity to cyber aggressive norms, \( F(1, 176) = 0.35, p = .555 \), Cohen’s \( f = .04 \). Conformity was not significantly higher in the high group centrality conditions (\( M = 1.63, SD = 0.82 \)) than in the low group centrality conditions (\( M = 1.67, SD = 0.86 \)). Therefore, the first hypothesis was not supported.

The second hypothesis stated that no accountability would lead to higher conformity to cyber aggressive norms on WhatsApp than accountability. The analysis yielded a statistically significant main effect of accountability on conformity to cyber aggressive norms, \( F(1, 176) = 5.91, p = .016 \), Cohen’s \( f = .18 \). Conformity was higher in the no accountability conditions (\( M = 1.80, SD = 0.85 \)) than in the accountability conditions (\( M = 1.50, SD = 0.80 \)). Thus, the second hypothesis was supported.

The third hypothesis stated that the combination of high group centrality and no accountability would lead to highest conformity to cyber aggressive norms, whereas the combination of low group centrality and accountability would lead to lowest conformity. The analysis yielded no statistically significant interaction effect between group centrality and accountability on conformity, \( F(1, 176) = 0.03, p = .869 \), Cohen’s \( f = .03 \) (see Table 3 for the mean difference scores in each condition). Thus, the third hypothesis was not supported.

The fourth hypothesis stated that the previously hypothesized effects would be moderated by individual susceptibility to peer pressure. However, the regression analyses yielded no statistically significant interaction effects between susceptibility to peer pressure and group centrality, susceptibility to peer pressure and accountability, or the three-way interaction between the two determinants and the moderator on conformity to cyber aggressive norms, \((all p’s \geq .312)\). Thus, the fourth hypothesis was not supported.

2.3. Discussion

The results provided support for a direct effect of accountability on conformity to cyber aggressive group norms. Early adolescents who believed that they did not have to discuss their responses in class conformed more to cyber aggressive group norms than those who believed that they did have to discuss their responses in class. However, there was no direct effect of group centrality, nor were the effects moderated by susceptibility to peer pressure. This experiment was the first to show a causal effect of accountability on conformity to norms on cyber aggression on WhatsApp. We further discuss these findings in the general discussion. To examine the robustness of this effect and provide greater validity to the findings, we conducted a replication of Experiment 1. In Experiment 2, we took into account three limitations concerning the experimental design.

First, even though with 180 participants we nearly obtained the intended sample size of 186 calculated in the a priori power analysis (see preregistration), we did not find an effect of group centrality. An explanation might be that our manipulation of group centrality was too weak to generate such an effect – potentially because both group centrality conditions supposedly consisted of classmates, and participants may have always valued their classmates’ norms, regardless of

### Table 2

| Group centrality   | Accountability |          | No accountability |          | Baseline group |          |
|--------------------|----------------|----------|--------------------|----------|----------------|----------|
|                    | Accountability |          |                    |          |                |          |
|                    | M    | SD | N   | M    | SD | N   | M    | SD | N   |
| High group centrality | 2.43 | .98 | 37 | 2.83 | 1.00 | 45 | 1.84 | .54 | 53 |
| Low group centrality  | 2.53 | .96 | 54 | 2.86 | 1.05 | 44 |       |     |     |

Note. Scores ranged between 1 and 6. Significant differences between conditions are indicated with subscripts. Means that do not share subscripts are statistically different at \( \alpha = .05 \).
differences in group centrality. Second, the average manipulated score of the ostensible classmates was used to calculate a difference score for conformity, differing for each of the target items. More specifically, for some target items the average score of the ostensible classmates was 4.67 (i.e., an average of 4, 4, and 5), whereas for others it was 5.33 (i.e., an average of 5, 6, and 5). As a consequence, the average manipulated score differed for some items, which may have made it “easier” to conform to some items than it was to others. Third, the interface of the experiment was simple and may have looked relatively artificial, which could have affected the ecological validity of the experiment. In this case, increasing the ecological validity of the experiment may actually strengthen the experimental manipulations, because participants may find the WhatsApp paradigm more recognizable and believable, and thus would behave more like they normally would around their peers.

Thus, in order to provide greater validity to the findings of Experiment 1, the goal of Experiment 2 was to replicate Experiment 1 while addressing these limitations. We addressed these limitations by (1) changing the reference group that was presented to participants as their ostensible peers, (2) making the average score of the ostensible peers the same for all items, and (3) adapting the presentation of the interface of the experiment so that participants might experience it as less artificial.

3. Experiment 2

3.1. Method

Procedures for ethical approval and data management were identical to those of Experiment 1. The preregistration and anonymized data of this experiment are available on the OSF (https://bit.ly/3bvsht0).

3.1.1. Design

The design was identical to that of Experiment 1.

3.1.2. Participants

The original sample consisted of 342 early adolescents. One group of participants (n = 18) was excluded because they communicated with each other about the experiment during the in-class session. As preregistered, we further excluded participants who did not complete the experiment (n = 13), who identified the purpose of the experiment (n = 12), or who failed both manipulation checks for the experimental manipulation (n = 3). Thus, the final sample consisted of 296 participants (52.4% female, 47.3% male, 0.3% did not specify) with an age range of 10 to 16 years old (M = 12.67, SD = 0.92), of which 243 were the experimental conditions, and 53 were in the baseline group. The majority of participants (97.9%) were born in The Netherlands and all participants were fluent in Dutch. Participants came from each of three main education levels that are distinguished in the Dutch secondary school system: preparatory vocational secondary education (16.2%), senior general secondary education (51.0%), and preparatory university secondary education (32.8%).

3.1.3. Procedure

The procedure was identical to that of Experiment 1.

3.1.4. Experimental manipulations

**Group centrality.** To address the first limitation of Experiment 1, we changed the reference group that was presented to participants. We did this to increase the difference between the two experimental conditions, potentially strengthening the manipulation. Again, we first asked participants to think about a group of classmates and answer the three questions that tapped into the centrality dimension of social identification (see Experiment 1) before ostensibly assigning participants to a group with three peers. Then, in the high group centrality condition we assigned participants to a group with ostensible classmates that they considered important to them (i.e., whose names they provided). However, rather than comparing them with ostensible low centrality classmates, like we did in Experiment 1, the low group centrality condition in Experiment 2 consisted of ostensible same-age peers from different schools who were participating in the experiment at the same time. To manipulate centrality, prior to the structured conversation participants were shown one of two messages: “You are assigned to a group that includes classmates from the group that you considered important to you” for high group centrality, or “You are assigned to a group with same-age peers from different schools” for low group centrality.

**Accountability.** The manipulation of accountability was identical to the manipulation used in Experiment 1.

3.1.5. Measures

3.1.5.1. Outcome variable. Conformity to norms on cyber aggression. We used the same validated scale as in Experiment 1. To address the second limitation of Experiment 1, we adapted the manipulated ostensible peers’ responses such that the average score of the ostensible peers was the same for all items. Specifically, we programmed the ostensible peers’ scores such that the average group norm score was 5 for all items (scores ranging from 4 to 6 on a 6-point scale, see procedure Experiment 1), as opposed to ranging between 4.67 and 5.33 as was the case in Experiment 1. Again, we computed a difference score for conformity to norms on cyber aggression using the absolute difference between the participants’ response and the average score of the ostensible peers. To facilitate the interpretation of the results, these scores were reversed such that higher scores indicated more conformity. The 12 items had good reliability (Cronbach’s α = .87, M = 1.61, SD = 0.76, scores ranged between 0.00 and 3.55).

3.1.5.2. Moderator variable. Susceptibility to peer pressure. We used the same validated scale as in Experiment 1, which had acceptable reliability (Cronbach’s α = .75, M = 2.34, SD = 0.83).

3.1.5.3. Manipulation checks. Perceived group centrality. We used the same validated scale as in Experiment 1, which had good reliability (Cronbach’s α = .88, M = 2.27, SD = 1.29).

Perceived accountability. We used the same validated scale as in Experiment 1, which had good reliability (Cronbach’s α = .79, M = 3.09, SD = 1.30).

### Table 3
Experiment 1 means and standard deviations for conformity to norms on cyber aggression (experimental conditions).

| Group centrality | Accountability | No accountability | Total |
|------------------|----------------|-------------------|-------|
|                  | M   | SD  | N  | M   | SD  | N  | M   | SD  | N  |
| High group centrality | 1.45 | 0.81 | 37 | 1.77 | 0.81 | 45 | 1.63 | 0.82 | 82 |
| Low group centrality | 1.54 | 0.81 | 54 | 1.83 | 0.90 | 44 | 1.67 | 0.86 | 98 |
| Total             | 1.55 | 0.80 | 91 | 1.86 | 0.85 | 89 | 1.65 | 0.84 | 180 |

Note. Scores ranged between 0.19 and 3.50. Means that do not share subscripts are statistically different at α = .05. Only the significant difference between the accountability conditions is indicated.
3.1.5.4. Control variables. The control variables were identical to those of Experiment 1.

3.1.6. Data analysis
Analyses were identical to those of Experiment 1.

3.2. Results

3.2.1. Preparatory analyses

Descriptive analyses showed that all participants used WhatsApp. Of these, 99.7% belonged to at least one group on WhatsApp. Participants most often belonged to 1 to 5 groups (57.4%), followed by 6–10 groups (29.4%), 11 to 15 groups (7.8%), 16 to 20 groups (2.7%), 21 to 25 groups (1.7%), 26 to 30 groups (0.3%) and more than 30 groups (0.8%). Of all participants, 83.1% used WhatsApp every day of the week, 6.1% day (1.4%), and 5 or more hours per day (0.3%).

There was a statistically significant positive correlation between participants’ educational level and conformity to cyber aggression (r = .17, p = .009), indicating that participants with a higher level of education conformed more to cyber aggressive norms. This variable was included as a covariate in the main analysis. Randomization checks showed that the four experimental conditions and the baseline group included as a covariate in the main analysis. Randomization checks conformed more to cyber aggressive norms. This variable was shown to be significantly higher for participants in the accountability conditions.

3.2.2. Main analyses

Contrary to our first hypothesis, high group centrality did not lead to higher conformity to cyber aggressive norms than low group centrality. The analyses yielded no statistically significant main effect of group centrality on conformity to cyber aggressive norms, F(1, 238) = 0.01, p = .907, Cohen’s f = .03. Conformity was not higher in the high group centrality conditions (M = 1.62, SD = 0.77) than in the low group centrality conditions (M = 1.60, SD = 0.75). Therefore, the first hypothesis was not supported.

The second hypothesis stated that no accountability would lead to higher conformity to cyber aggressive norms on WhatsApp than accountability. The analysis yielded a statistically significant main effect of accountability on conformity to cyber aggression, F(1, 238) = 2.36, p = .041, Cohen’s f = .13. Conformity was higher in the no accountability conditions (M = 1.70, SD = 0.76) than in the accountability conditions (M = 1.52, SD = 0.75). Thus, the second hypothesis was supported.

The third hypothesis stated that the combination of high group centrality and no accountability would lead to highest conformity to cyber aggressive norms, whereas the combination of low group centrality and accountability would lead to lowest conformity. The analysis yielded no statistically significant interaction effect between group centrality and accountability on conformity, F(1, 238) = 0.53, p = .329, Cohen’s f = .06 (see Table 5 for the mean difference scores in each condition). Thus, the third hypothesis was not supported.

The fourth hypothesis stated that the previously hypothesized effects would be moderated by individual susceptibility to peer pressure. However, the regression analyses yielded no statistically significant interaction effects between susceptibility to peer pressure and group centrality, susceptibility to peer pressure and accountability, or the three-way interaction between the two determinants and the moderator on conformity to cyber aggressive norms (all t’s ≤ .019, all p’s ≥ .329). Thus, the fourth hypothesis was not supported.

4. General discussion

The two experiments reported in this paper were the first to test the causal effects of group centrality and accountability on conformity to norms on cyber aggression. Specifically, we examined the main and combined effects of group centrality and accountability, and examined whether these were moderated by susceptibility to peer pressure. The findings are consistent across both experiments. Our manipulations of group centrality did not affect conformity to norms on cyber aggression, but the manipulation of accountability did. In both experiments, early adolescents who believed that they did not have to discuss their responses in class conformed more to cyber aggressive group norms than those who believed they did have to discuss their responses in class. The combination of high group centrality and no accountability did not lead to highest conformity, nor were any of the effects moderated by susceptibility to peer pressure. These findings suggest that increasing accountability in mobile messaging apps may be viable strategy to disrupt the relatively automatic process of group-based conformity.

4.1. Group centrality, accountability, and conformity to norms on cyber aggression

Contrary to our first hypothesis, high group centrality did not lead to higher conformity to cyber aggressive norms than low group centrality. The analyses yielded no statistically significant main effect of group centrality on conformity to cyber aggressive norms, F(1, 238) = 0.01, p = .907, Cohen’s f = .03. Conformity was not higher in the high group centrality conditions (M = 1.62, SD = 0.77) than in the low group centrality conditions (M = 1.60, SD = 0.75). Therefore, the first hypothesis was not supported.

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### Table 4

Experiment 2 means and standard deviations for raw scores (experimental conditions) and uninfluenced scores (baseline group).

|                     | Accountability | No accountability | Baseline group |
|---------------------|----------------|-------------------|---------------|
|                     | M   | SD  | N   | M   | SD  | N   | M   | SD  | N   |
| High group centrality | 2.53a| 0.97 | 57  | 2.85a| 0.81 | 61  | 1.80b | 0.47 | 53  |
| Low group centrality | 2.63a| 0.73 | 60  | 2.74a| 0.87 | 65  |       |      |     |

Note. Scores ranged between 1 and 6. Significant differences between conditions are indicated with subscripts. Means that do not share subscripts are statistically different at α = .05.
higher conformity to cyber aggressive norms than low group centrality. This is inconsistent with what we expected from the SI perspective (Tajfel & Turner, 1979; Turner et al., 1987) and previous studies on the relation between social identification and group conformity (Kim & Park, 2011; Lee, 2006, 2007). However, these previous studies used undergraduate student samples and did not focus on messaging apps specifically as these apps did not exist yet at the time. A potential explanation for our current findings in the context of WhatsApp may be that, for adolescents, peers exert such a powerful influence that it overrides the effect of group centrality. Previous conformity research found that conformity strengthens when group identification increases (Kim & Park, 2011; Lee, 2006, 2007). Nonetheless, this same research shows that people also have a general tendency to conform to group norms and behaviors when their social identity is salient (Hogg & Reid, 2006). This means that, regardless of the extent of their social identification, people tend to conform to group norms. In the context of WhatsApp groups, it could thus be that the subjective value assigned to a group – that is, whether or not the group is considered highly important to the self or not – may not have added value over this general process of conformity to salient group norms. The results of the preparatory analyses of both experiments show that the raw scores of all experimental conditions are significantly higher than the uninfluenced scores of the baseline group. This is in line with the current explanation that conformity to the group norm can, to a certain extent, be considered relatively automatic behavior, in the sense that people usually conform to salient social groups with which they identify (Hogg & Reid, 2006).

A second potential explanation pertains to the experimental paradigm. Specifically, our manipulations of group centrality may not have been strong enough to induce substantial effects. It appears that all participants valued peer norms, regardless of the group centrality condition they were assigned to, given the findings that adolescents not only conformed to classmates they deemed important to them, but also to classmates that they did not deem important to them (Experiment 1), or same-age peers from different schools (Experiment 2). Even though the experimental manipulations significantly affected the manipulation check of perceived group centrality, the effects of group centrality were small (Cohen’s f = .04 in Experiment 1 and 0.03 in Experiment 2). This may have to do with the ecological validity of the experiments, which will be further discussed in the limitations section.

In line with our second hypothesis, adolescents who were not held accountable for their responses conformed more to cyber aggressive norms than adolescents who were held accountable for their responses. Building on the idea that conformity may be relatively automatic behavior, our findings suggest that accountability could potentially interrupt this automatic process. Much like when children show less support for a peer norm of social exclusion when they are made accountable in a school setting (McGuire et al., 2015), accountability may inhibit automatic behavioral responses in WhatsApp groups. Holding adolescents accountable may lead them to consider their behaviors more thoroughly, and particularly, how they would defend these behaviors to others. Consequently, no accountability to people outside of the group may have resulted in increased conformity. In future interventions aimed at reducing conformity to cyber aggression, an important role should be set aside for inducing accountability, as this could potentially overrule the general effect of group conformity.

Contrary to our third hypothesis, there was no cumulative effect of group centrality and accountability on conformity to cyber aggressive norms. The combination of high group centrality and no accountability did not lead to highest conformity, nor did the combination of low group centrality and accountability lead to lowest conformity, most probably because there was no effect of group centrality overall. As discussed above, the ostensible peer group members seemed to exert an influence on early adolescents, regardless of how important adolescents perceived their messaging group to be. Apparently, it did not matter whether early adolescents were in high or low centrality groups: they tended to conform to group norms. This explanation was also corroborated by the results of the preparatory analyses. These showed that the raw scores of all experimental conditions were significantly higher than the uninfluenced scores of the baseline group, and, thus, that early adolescents had a general tendency to conform to group norms. In the WhatsApp paradigm that we used, accountability appeared to play a more substantial role than group centrality.

### 4.2. Susceptibility to peer pressure as a moderator

Contrary to our fourth hypothesis, the main and combined effects of group centrality and accountability were not moderated by individual susceptibility to peer pressure. A potential explanation for the lack of these moderated effects is that there was little variance in susceptibility scores in our sample. Susceptibility to peer pressure was relatively low on average, thus, a sample that includes adolescents with a broader range of susceptibility scores would be needed to adequately test the role of susceptibility to peer pressure. Alternatively, it is conceivable that susceptibility to peer pressure would particularly affect the effect of group centrality rather than that of accountability, because our manipulations of group centrality clearly concerned potential influence from different peers (close vs. distal peers), whereas our manipulation of accountability also concerned potential influence from an adult (e.g., a teacher) by having to discuss one’s responses in class. Following this reasoning, the potential moderating influence of susceptibility to peer pressure may have been less relevant for accountability than it was for group centrality. Executive-functioning skills that relate to inhibiting automatic behavioral responses, such as self-regulation and inhibitory control (Brechwald & Prinstein, 2011; Van Royen, Poels, Vandebosch, & Adam, 2017), may, therefore, better explain individual inclinations to conform to cyber aggression as a function of accountability. This explanation, however, is speculative and needs to be explored further.

### 4.3. Limitations and future research directions

The findings of these two experiments have important theoretical and practical implications. However, before discussing these implications, we first need to address some limitations. The first limitation concerns the ecological validity of our experiments. The scripted conversation took place in an online environment that was visually similar to WhatsApp. Nevertheless, the interaction itself was relatively artificial. Participants responded to statements about social media behaviors by providing a response in the form of a score that ranged from 1 to 6,
which does not reflect typical peer-to-peer interactions on WhatsApp. Future research could address this limitation by designing more ecologically valid WhatsApp-environments that can be used to test conformity effects in experimental designs, for example by using real conversations between early adolescents as basis for the preprogrammed scripts. This may increase the strength of the experimental manipulations and, thus, their potential effects.

A second limitation lies in the power of the experiments. For both experiments, we conducted a priori power analyses to determine sample size, based on an effect size of medium strength (Cohen’s $f = .21$). Even though the actual sample sizes were slightly smaller than aimed for, post hoc sensitivity analyses determining the minimum detectable effect size still confirmed a detectable effect of .21 for Experiment 1 and .18 for Experiment 2. The effects of group centrality on conformity were much smaller (.04 and .03, respectively); therefore, it would be advisable for future research to increase the power such that smaller effect sizes can be detected, for example Cohen’s $f = .10$, which can be considered small but may still be meaningful (Bakker et al., 2019), as effects in experimental paradigms are likely to be smaller than in real-life. The question remains what would be a meaningful effect size in an artificial paradigm such as the one that we used.

Moreover, to further develop and test applied interventions aimed at reducing cyber aggression on WhatsApp, future research would first need to further examine how the automatic conformity process may be disrupted, for example by testing the effect of an eye gaze prime to induce accountability perceptions and reduce antisocial behavior (Dear, Dutton, & Fox, 2019), or by increasing adolescents’ motivation and self-efficacy to not engage in cyber aggression (Popovac & Fine, 2018). Educational programs could then, incorporate these techniques to increase early adolescents’ accountability perceptions when navigating the digital world. We also encourage future research to further examine how peer group dynamics and medium-related factors affect conformity to cyber aggression. The current study shows that accountability affects conformity. However, the question remains which features or affordances of present-day media applications exactly cause these diminished feelings of accountability in mobile messaging apps such as WhatsApp.

4.4. Implications and conclusion

Taking into account these limitations, this study makes an important theoretical contribution by causally testing the determinants of conformity to cyber aggressive norms in messaging apps, and demonstrating that accountability affects conformity to cyber aggression among early adolescents. The study extends conformity research to the context of messaging apps in general, and to WhatsApp in particular. The findings add that, regardless of how strong the interpersonal relations were in peers’ messaging groups, early adolescents’ peer norms were always considered important. Consistent with what was found in research among more adult populations (Hogg & Reid, 2006), adolescents appear to have a general tendency to conform to their group members, regardless of their level of experienced group centrality. Perhaps, conforming to group norms is always perceived important in WhatsApp groups, and group centrality does not add value over this general process of conformity to peer group norms. Being accountable, however, may disrupt this process and can motivate early adolescents to inhibit their negative behavioral responses. On a practical level, the findings of this study have implications for prevention and intervention initiatives, as they suggest that increasing perceptions of accountability on WhatsApp may help early adolescents to become more resilient to conformity to cyber aggressive norms.

Credit author statement

Danielle N.M. Bleize: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization, Project administration. Doeschka J. Anschütz: Conceptualization, Methodology, Writing – review & editing, Supervision. Martin Tanis: Conceptualization, Methodology, Writing – review & editing, Supervision. Moniek Buijzen: Conceptualization, Methodology, Writing – review & editing, Supervision.

Data availability statement

The data that support the findings of this study are openly available on the Open Science Framework (OSF) at https://bit.ly/3bvsht0.

Declaration of competing interest

None.

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