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When is Computer-Mediated Intergroup Contact Most Promising? Examining the Effect of

Out-Group Members' Anonymity on Prejudice

Abstract

Computer-mediated intergroup contact (CMIC) is a valuable strategy to reduce negative

sentiments towards members of different social groups. We examined whether characteristics

of communication media that facilitate intergroup encounters shape its effect on out-group

attitudes. Specifically, we propose that concealing individuating cues about out-group

members during CMIC increases prejudice, as interaction partners are perceived as less

socially present. To assess these hypotheses, we conducted two mixed-factorial experiments.

Participants engaged in synchronous text-chat with out-group members (Study 1) and a

confederate (Study 2) who either shared or concealed their name and photo.   Overall, CMIC

reduced negative out-group sentiments. Study 2 showed, however, that out-group members'

anonymity decreased perceived social presence, which was associated with less positive

evaluations of the CMIC and higher prejudice. In conclusion, CMIC can contribute to

conflict resolution interventions, preparing individuals for direct intergroup contact, if its

affordances or conversation topics enhance interaction partners' social presence.

Keywords: intergroup contact, prejudice, anonymity, social presence, computer-

mediated communication

When is Computer-Mediated Intergroup Contact Most Promising? Examining the Effect of

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Approximately 40 percent of the population worldwide has access to the internet and digital communication tools (Internetlivestats, 2017) that connect users who come from diverse ethnic or religious backgrounds, have a different social status or opposing political beliefs (Postmes, Spears, & Lea, 1998, 2002). At the Center for Multiculturalism and Technology in Israel, for instance, computer-mediated communication (CMC) services facilitated exchanges between secular Jewish, Orthodox Jewish, and Arab-Islamic teachers (Hoter, Shonfeld, & Ganayim, 2009). After initial text-chats teachers used audio and then video conferencing to engage with out-group members. Following the online intergroup interactions, teachers expressed less prejudice towards the most unfavorable out-group. Negative attitudes of religious Jews towards Muslims were reduced, as were Muslims' negative attitudes towards religious and secular Jews (Walther, Hoter, Ganayem, & Shonfeld, 2015).

Intergroup contact certainly is a powerful strategy to overcome conflict and engender harmonious relations between social groups (Allport, 1954; Pettigrew & Tropp, 2006). In addition to a substantial literature attesting to the impact of direct, face-to-face intergroup encounters, empirical evidence (Alvídrez, Piñeiro-Naval, Marcos-Ramos, & Rojas-Solís, 2015; Schwab & Greitemeyer, 2015; Tynes, Giang, & Thompson, 2008; Walther et al., 2015; White, & Abu-Rayya, 2012; White, Abu-Rayya, & Weitzel, 2014; White, Abu-Rayya, Bliuc, & Faulkner, 2015) as well as evaluations of internet-based conflict reconciliation programs (Abbott, Austin, Mulkeen, & Metcalfe, 2004; Cuhadar & Kampf, 2014; Hoter et al., 2009; Stock et al., 2009) suggest that computer-mediated intergroup contact (CMIC) can as well promote positive out-group attitudes.

The present research extends this work and highlights conditions that moderate the effect of CMIC on prejudice. Specifically, we sought to assess whether characteristics of communication media, such as social media platforms, chat tools, or email services, that enable computer-mediated intergroup contact shape its influence on out-group attitudes.   In doing so, we focused on anonymity, an affordance that has emerged as a universal value of computer-mediated interactions. We investigated if intergroup encounters during which out-group members remain anonymous—concealing individuating information —*increase* prejudice. We further aimed to examine whether this effect is mediated by perceptions of out-group members' reduced social presence, that is, their reduced involvement in the intergroup contact. To answer these research questions we conducted two mixed-factorial laboratory experiments, exploring intergroup relations in higher education and involving opinion-based groups as well as groups with a different status. Participants engaged in CMIC through synchronous text-chats with out-group members (Study 1) and an out-group confederate (Study 2) to collaborate towards a common goal. Out-group attitudes and evaluations of the intergroup experience were assessed with self-reported measures.

1.1 Computer-Mediated Intergroup Contact

Meeting an out-group member and having out-group friends can reduce prejudice (Brown & Hewstone, 2005; Pettigrew & Tropp, 2006; 2008) due to lower feelings of anxiety *(intergroup anxiety;* Paolini, Hewstone, Cairns, & Voci, 2004; Hewstone & Voci, 2003) as well as increased empathy (McFarland, 2010; Turner, Hewstone, & Voci, 2007). Such direct intergroup contact, however, is not always feasible or wanted, as it commonly requires individuals to come together in person and get actively involved in the interaction (Harwood, 2010). Indirect forms of contact address these concerns. Vicarious intergroup encounters— knowing or hearing about in-group members who have out-group contact or friends—also improve out-group attitudes (Cameron, Rutland, Brown, & Douch, 2006; Paolini et al., 2004;

Turner et al., 2007; Wright, Aron, McLaughlin-Volpe, & Ropp, 1997) by lowering intergroup anxiety, changing perceptions of in-group and out-group norms, and by promoting inclusion of the out-group in the self (Vonofakou, Hewstone, & Voci, 2007). Moreover, imagining intergroup interactions has been found to reduce prejudice (Turner, Crisp, & Lambert, 2007; Turner & Crisp, 2010), encouraging intentions to meet the out-group (Crisp & Husnu, 2011; Husnu & Crisp, 2010) and strengthening out-group trust, which reduces the tendency to dehumanize members of the out-group (Vezzali, Capozza, Stathi, & Giovannini, 2012).

Computer-mediated intergroup contact is another alternative to—or rather a variation of—engaging with an out-group member face-to-face. Amichai-Hamburger and McKenna (2006) in fact noted that the internet is "the most successful means of facilitating (…) [intergroup] contact (…) particularly [between individuals] who otherwise would not have had the opportunity, nor perhaps the inclination, to meet" (p. 826). Individuals interact online beyond physical boundaries using (a)synchronous communication tools (e.g., email, chat), social media sites (e.g., Facebook, Twitter), and/or purpose-built platforms. CMIC can emerge spontaneously or be part of formal conflict reconciliation programs (see the Good Neighbors Web project, McKenna, Samuel-Azran, & Sutton-Balaban, 2009; Net Intergroup Platform, Amichai-Hamburger, 2010).

The benefit of computer-mediated intergroup contact, in particular between individuals from different ethnic and religious groups, has been demonstrated in a limited number of studies that have, however, yielded promising results (see Lemmer & Wagner, 2015, for a meta-analysis). Tynes and colleagues (2008) showed that 74.5% of participants who had interacted with users from different ethnic backgrounds in various online settings reported having learnt more about the out-group. For European American participants, more frequent intergroup encounters online were also associated with a stronger willingness to get to know members of other ethnic groups. For minority and multi-racial participants this

correlation was not significant. In addition, Austrian users of the social network site Facebook who had established more ties abroad expressed more favorable attitudes towards ethnic minorities, foreigners, Muslims, and Jews (Schwab & Greitemeyer, 2015).

Experimental evidence from White and colleagues' dual-identity e-contact program (White & Abu-Rayya, 2012; White et al., 2014; White, Abu-Rayya, et al., 2015) provides the strongest support for the valuable contribution of computer-mediated intergroup contact. Muslim and Christian students from segregated religious schools in Australia interacted over eight weeks through text-based synchronous chats, with either a religious in- or out-group member. The students explored in each session how "their religious identities can actively contribute to an 'environmentally sustainable future for Australia'" (White & Abu-Rayya, 2012, p. 599). That is, the in-group's (religious) identity as well as a superordinate (national) identity were salient. Two weeks after the program, students from both religious groups who had engaged in intergroup contact online reported reduced intergroup bias and anxiety as well as increased out-group knowledge (White & Abu-Rayya, 2012). Twelve months after the intervention, intergroup bias was further reduced (White et al., 2014).

The aforementioned studies assessed computer-mediated intergroup contact that was afforded by different synchronous and asynchronous CMC tools as well as through connections on a social network site. This attests to the broad potential influence of CMIC. At the same time, however, previous research did not acknowledge that unique characteristics—the design and functionalities—of communication media can shape the nature, individuals' perceptions, and the outcomes of computer-mediated interactions (Döhring, 2003). Text-based, compared to audio-visual CMC lacks, for instance, possibilities for simultaneous feedback; interaction partners can only respond once they have received a message but not while the message is being typed. Consequently, it is more difficult to signal active listening and establish effective turn taking (Herring, 1999). Synchronicity—the

extent to which individuals' contributions and the response they receive are simultaneous—further affects the communication flow. If synchronicity is low, as in email or comment sections of blogs, interaction partners' attention may be distracted (Lowry, Romano, Jenkins, & Guthrie, 2009). These examples illustrate that affordances of the media that are used to establish computer-mediated intergroup encounters can influence the contact experience, and thereby mitigate or, as we will argue, even reverse its prejudice-reducing effects. We elaborate on this argument below, focusing on an affordance that resembles one of the most striking differences between direct and computer-mediated intergroup contact—the possibility to remain anonymous.

1.2 Anonymity

Anonymity and pseudonymity—being able to (partially) dissociate one's online and offline identity by concealing one's name, location, and identifying visual cues—is in many online settings a default option and can be actively chosen in others (e.g., adding pictures of cartoon characters and abbreviating one's name on social media platforms; Collins, 2013). It has been argued that anonymity could promote autonomy and the unbiased perception of users, regardless of their age, gender, or ethnic background (Christopherson, 2007). In an intergroup context, anonymity could reduce anxiety (Amichai-Hamburger & McKenna, 2006; Amichai-Hamburger & Furnham, 2007). Individuals would not have to fear physical harm, they can take time to develop an answer (White, Harvey, & Abu-Rayya, 2015), and should feel more confident and less worried about being judged by the out-group (Stephan & Stephan, 1985). The *equalization hypothesis* (Dubrovsky, Kiesler, & Sethna, 1991) postulates thereto that since individuating characteristics are less pronounced, "individuals [are free] from the restraints imposed by group membership, [and] interaction via CMC is more equal" (Postmes & Spears, 2002, p. 1074). Tentative support for these arguments has shown that socially anxious individuals felt less uncomfortable in computer-mediated as

compared to face-to-face discussions (McKenna, Seidman, Buffardi, & Green, 2007, cited by McKenna, 2008). Moreover, sensitive topics were more frequently discussed in text-based chats online than in face-to-face interactions (Blau & Barak, 2012). Ultimately, if intergroup anxiety truly is reduced and interactions are more equal during anonymous CMIC, individuals should be more inclined to interact with out-group members under those conditions, rely less on stereotypes, and express less prejudice.

This optimistic thesis has, however, been called into question (Postmes & Baym, 2005). Notably, individuals preferred to collaborate in virtual teams with an in-group rather than an out-group member if no pictures and biographic information was provided. If individuating cues were presented, in-group and out-group members were chosen nearly equally frequently for collaboration (Tanis & Postmes, 2007). Alvídrez and colleagues (2015) demonstrated that anonymity undermines as well the impact of stereotype-disconfirming behavior on prejudice. In their study, Spanish university students interacted with three in-group members and one confederate out-group member (i.e., an Ecuadorian student) via synchronous text-chat. Flags simply indicated students' nationality in the anonymous condition, and photos helped individuate fellow participants in the personalized condition. Stereotype-disconfirming behavior increased attraction to out-group members, which reduced prejudice; stereotype disconfirmation, however, also decreased out-group members' perceived typicality and thereby increased prejudice. These relations were significantly stronger in the anonymous condition. The authors speculated that sharing out-group members' nationality but no individuating information did not make it possible to establish a feeling of familiarity. Instead, strong out-group stereotypes might have been activated and perceived out-group variability may have been reduced (Judd & Park, 1988; Rubin, Hewstone, & Voci, 2001), to a point where stereotype-disconfirming behavior could not improve the established perceptions (Alvídrez et al., 2015).

In addition, it has been found that anonymity strengthens, rather than removes, group boundaries (Reicher, Spears, & Postmes, 1995). Students from the Netherlands and England interacted via synchronous text-chat over three weeks, either sharing photos and their first name or displaying only their initials and university affiliation (Postmes et al., 2002). If participants exchanged messages with anonymous interaction partners group identities were more salient, and the groups' attitudes on political issues, such as legalization of drugs, the monarchy, and scientific research into homosexuality, became more polarized. Attitudes of identifiable Dutch and English students converged during the interactions (Postmes et al., 2002).

1.3 Social Presence and Intergroup Contact

In conclusion, CMIC that is afforded by tools or platforms that enable users' anonymity can impair harmonious intergroup relations. Previous research suggests that cognitive processes may explain these findings (Alvídrez et al., 2015; Postmes et al., 2002). We propose that it is important to consider as well how out-group members are perceived *during* anonymous computer-mediated intergroup contact. Notably, concealing their looks, name, or biographic information may reduce interaction partners' perceived *social presence* (Aragon, 2003; Newberry, 2001). Social presence is closely related to concepts of intimacy and immediacy (Gunawardena & Zittle, 1997); it pertains to a notion of being in an interaction *together* rather than simply being *there* (Biocca, 1997; Biocca & Nowak, 2001; Rüggenberg, 2007). That is, if an out-group member is less socially present, others are less aware of her/him, and s/he is perceived as less involved and available in the intergroup encounter (Park & Sundar, 2015; Tu & McIsaac, 2002).

Low perceived social presence is related to decreased satisfaction with (Gunawardena & Zittle, 1997; Hostetter & Busch, 2006; Richardson & Swan, 2003) and reduced quality of (Roberts, Lowry, & Sweeney, 2006) interactions, as well as less positive behavior in

collaborative groups, such as fewer practices of inclusion and open conversations (Kreijns, Kirschner, Jochems, & Van Buuren, 2004). If interaction partners are less socially present, communication is more impersonal (Park & Sundar, 2015) and discussing complex topics is more likely to be complicated by misunderstandings (Döhring, 2003). Bente, Rüggenberg, Krämer, and Eschenburg (2008) further demonstrated that using audio, video, or avatars as compared to text-chat alone increased individuals' perceived social presence and thereby affective interpersonal trust. Studies that examined the role of self-disclosure in intergroup contact (Dovidio, Gaertner, & Kawakami, 2003; Miller, Brewer, & Edwards, 1985; Wright, Aron & Tropp, 2002; Wright & Van der Zande, 1999; Tam, Hewstone, Harwood, Voci, & Kenworthy, 2006) moreover suggest that sharing—rather than concealing—intimate, personal information improves out-group attitudes by fostering empathy and trust (Turner, Hewstone, et al., 2007). Experiencing mutual self-disclosure also led individuals to view the intergroup encounter as important and valuable (see Ensari & Miller, 2002) and increased perceived out-group variability (Harwood, Hewstone, Paolini, & Voci, 2005).

1.4 The Present Research

The effect of computer-mediated intergroup contact on out-group attitudes has thus far been investigated predominantly in settings where interaction partners were personally identifiable. Schwab and Greitemeyer (2015) studied inter-cultural contact that was established (or represented) on the social network site Facebook; although anonymity can be achieved on the site, users are clearly encouraged to use their real name and upload a picture as well as a range of individuating information. In White and Abu-Rayya's research (2012; White et al., 2014; White, Abu-Rayya, et al., 2015), the children started the eight-week contact intervention with two sessions in which they exchanged information to get to know each other. Finally, at the Center for Multiculturalism and Technology individuating cues were gradually introduced over time, as teachers moved from text-chat to audio-visual and

face-to-face contact (Hoter et al., 2009; Walther et al., 2015).

Advancing this literature, we aimed to assess how CMIC that enables out-group members to conceal individuating cues shapes intergroup relations. Building on the aforementioned research on anonymity and social presence, we postulate that if out-group members remain anonymous during computer-mediated intergroup contact, interactions are not intimate, which would provide the optimal condition for improving out-group attitudes (Allport, 1954; Hamberger & Hewstone, 1997; Miller, 2002; Pettigrew, 1998). Instead, out-group members' anonymity should enforce perceptions of low social presence and low involvement in the intergroup encounter. As a consequence, prejudice ought to be (further) enhanced, rather than undermined. More precisely, we predict that computer-mediated intergroup contact during which out-group members remain anonymous will increase prejudice (Hypothesis 1; Studies 1-2). We further predict that this effect will be mediated by out-group members' lower perceived social presence (Hypothesis 2; Study 2). Below we report two experiments to test these hypotheses.

2.1 Study 1

We conducted Study 1 at a large Belgian university; the study was approved by the respective institutional ethics board. At this university students can choose to join faculty-specific student fraternities (*cercles étudiants)*. The fraternities are often criticized for promoting sexist and unlawful behavior (La Libre, 2013) in particular during their two-month long initiation rituals—the "baptism" *(baptême)*. Students who go through the baptism are a numerical minority on campus; at some activities they are visually distinct by wearing a cap with a long shield. Importantly, students who participate in the baptism and those who do not—we refer to them from now on as baptized and non-baptized—attend the same classes.

A pilot study ($N = 61$), also carried out at the university where we conducted Study 1, explored baptized and non-baptized students' out-group attitudes. Students were asked to

report with five words what they thought about the respective out-group. We did not specify the valence of these words. Results indicated that non-baptized students evaluated baptized students predominantly negatively; they described them most frequently as 'dirty', 'only interested in having a good time', 'alcoholics', 'cliquey', and 'being not successful at university'. Baptized students likewise evaluated non-baptized students negatively, most frequently as 'serious', 'focusing too much on their studies', 'introverted', 'uptight', and 'not interested in having a good time'.

2.1.1 Method

2.1.1.1 **Participants and Design.** Sixty-four (M_{age} = 19.72 (SD_{age} = 1.42) years old, 73.4% female) first-year psychology students participated in the study for course credit; N = 32 students were baptized, the remaining N = 32 students were non-baptized. As we did not work with confederates (see below), every participant acted as an out-group member for their interaction partner. Manipulating out-group members' anonymity thus implied a manipulation of anonymity of the matched student. Students were therefore randomly assigned to one of four conditions created by crossing anonymity of the out-group member and anonymity of the self (see Sassenberg & Postmes, 2002), resulting in N = 16 participants per condition. This 2 (anonymity of out-group member: anonymous/not) x 2 (anonymity of the self: anonymous/not) x 2 (time of rating out-group attitudes: before/after CMIC) mixed-factorial design, with repeated measures on the last factor, allowed us to identify the unique influence of out-group members' anonymity as compared to the effect of anonymity of the self.

2.1.1.2 **Procedure.** We conducted the study at the beginning of student' first year, shortly after the baptism process had started. Baptized and non-baptized students registered for the study separately but were invited in pairs. Great care was taken that participants did not encounter each other as they arrived at the experiment. Only after the baptized student

was seated in the laboratory did a research assistant bring in the non-baptized student from a different room. Students completed the study on individual computers, and these were separated by partitions. Students who were *non-anonymous* during the CMIC had their photo taken, which was entered with their full name in the profile of the chat software. For participants who remained *anonymous*, who concealed identifying cues, the chat profile included a black square where their photo should be and an arbitrary username.

Students first completed a questionnaire and were then asked to join a synchronous text-chat with an out-group member. Students were instructed to discuss with a baptized/non-baptized student how the social network site Facebook could be used for studying and to help them prepare for exams. We highlighted that based on their experience all participating students should have valuable insights on this topic, and we noted that the university administration was interested in their ideas. In other words, the discussion should have allowed for collaboration towards a common goal, emphasizing equal status and authority support (Allport, 1954). These conditions have been shown to facilitate the effect of intergroup contact on prejudice, although they are not considered necessary (Pettigrew & Tropp, 2006).

The text-chat was completed with a free, widely available software that students were likely familiar with. The chat tool offered a main interface to record the exchange, a section where contributions could be typed, and it showed the interaction partner's photo and name. Emoticons could be used, and students were informed when their interaction partner was typing. The CMIC lasted for 15 minutes and was supervised by a research assistant who was to intervene if students talked off-topic; this was not required in any of the sessions. After the chat, students completed a second questionnaire and were then debriefed. The debriefing focused specifically on the fact that students who engaged with anonymous out-group members may have found the interaction unpleasant and considered the out-group member as

being uninvolved. In order to address the concern that participation in our study would result in lasting increased prejudice, we explained that these experiences were likely due to the design of the communication media, the affordances of the text-chat, rather than the out-group member and the out-group as a whole.

2.1.1.3 **Materials.** Following *demographic* questions about their gender and age, students indicated whether they had started/completed the baptism, that is, whether they were (to be) baptized or not. Those who had registered for the study as baptized were asked for the unique name that they carry within the fraternity (a common practice), the year they joined, and in which fraternity they were a member. We further examined students' *in-group identification* with one item ('How much do you identify with baptized/non-baptized students'; 1 = *not at all*; 7 = *completely*). Before and after engaging in the CMIC students reported *explicit negative out-group attitudes*, based on the negative characteristics that had been established in the pilot study. Baptized students indicated how strongly they agreed that non-baptized students are 'too focused on their studies,' 'introverted', 'uptight', 'not interested in having a good time', and 'serious' (1 = *not at all*; 7 = *completely*). Principal component analysis with oblimin rotation indicated that the five items loaded on two factors (Factor 1: eigen value = 2.14, variance explained = 42.80%; Factor 2: eigen value = 1.59, variance explained = 31.83%); Factor 2 included only two items, 'serious' and 'too focused on their studies'. It is suggested that if only two items load on one factor in a two-factor solution this factor ought not to be considered (Field, 2013). Rather than limit the information on out-group attitudes to Factor 1, we therefore decided to treat each item as a separate variable.

Non-baptized students reported how strongly they agreed that baptized students are 'dirty', 'alcoholic', 'not successful at university', 'only interested in having a good time', and 'cliquey' (1 = *not at all*; 7 = *completely*). Again, principal component analysis with oblimin

rotation indicated that the five items loaded on two factors (Factor 1: eigen value = 1.60, variance explained = 32.02%; Factor 2: eigen value = 1.34, variance explained = 26.73%); Factor 2 included only the items 'not successful at university' and 'cliquey'. As discussed above, we decided to treat each item as a separate variable.

Following the CMIC students also completed a *manipulation check*. We assessed to what degree students believed that the out-group member they had interacted with was anonymous or personally identifiable as well as whether they themselves had remained anonymous or were identifiable to the out-group student (1 = *fully anonymous*; 7 = *fully identifiable*).

2.1.2 Results and Discussion

2.1.2.1 Manipulation Check. A multivariate analysis of variance showed that students who interacted with an anonymous out-group member perceived her/him as less personally identifiable (*M* = 2.59, *SD* = 1.39) than students who interacted with an out-group member who shared her/his photo and name (*M* = 4.03, *SD* = 2.02) ($F(1, 62)$ =10.98, *p* = .00, η^2 = .15). Those who were identifiable to the out-group member felt as if they shared more information that made them personally identifiable (*M* = 4.25, *SD* = 1.87) than students who remained anonymous (*M* = 3.22, *SD* = 1.98) ($F(1, 62)$ = 4.60, *p* = .04, η^2 = .07). The manipulations of anonymity were therefore successful.

2.1.2.2 Effects of CMIC and Anonymity on Negative Out-Group Attitudes. We conducted repeated measures analyses with anonymity of the out-group member and anonymity of the self as between-subject factors. Non-baptized students evaluated baptized students after the CMIC marginally significantly lower as 'not successful at university' ($F(1, 28)$ = 3.59, *p* = .07, η^2 = .11). Evaluations of baptized students as being 'dirty' ($F(1, 28)$ = 8.58, *p* = .01, η^2 = .23), 'alcoholics' ($F(1, 28)$ = 8.51, *p* = .01, η^2 = .23), and 'only interested in having a good time' ($F(1, 28)$ = 9.40, *p* = .01, η^2 = .25) were significantly reduced over

time. High evaluations of non-baptized students being 'cliquey' did not change significantly ($F(1, 28) = 1.21$, $p = .28$, $\eta^2 = .04$). Interaction effects with the factors anonymity of the out-group member or anonymity of the self were not significant (Table 2). No gender differences were identified (Appendix).

Moreover, baptized students' out-group attitudes did not change over time; they did not evaluate non-baptized students as less 'serious' ($F(1, 28) = 2.37$, $p = .14$, $\eta^2 = .08$), 'uptight' ($F(1, 28) = 1.19$, $p = .29$, $\eta^2 = .04$), 'not interested in having a good time' ($F(1, 28) = .11$, $p = .74$, $\eta^2 = .00$), 'introverted' ($F(1, 28) = .04$, $p = .85$, $\eta^2 = .00$), or 'focused on their studies' ($F(1, 28) = .46$, $p = .50$, $\eta^2 = .02$). Only one interaction effect was significant; participants who were non-anonymous evaluated non-baptized students after the CMIC as less serious (Table 2). No gender differences were identified (Appendix).

—Insert Table 1 here—

—Insert Table 2 here—

Overall, our findings replicated previous research and highlight that computer-mediated intergroup contact improves out-group attitudes. Contrary to our hypothesis, anonymity of the out-group member did not moderate the effect of CMIC. Power analyses, using G*Power 3.1 sensitivity analyses, which consider pre- and post-measure correlations (Faul, Erdfelder, Lang, & Buchner, 2007), indicated that despite the small sample size of $N = 64$ students (and four conditions), an $\alpha = .05$, and power ($1-\beta$) $= .80$, small to moderate interaction effects of the two between-subject factors (as well as their interaction) on attitude changes over time could have been detected (Appendix).

The unexpected results may thus be explained by the study design and procedure;

consideration of these issues yielded valuable insights for a follow-up experiment. More precisely, the manipulation of anonymity might have been flawed in that although individuating cues were successfully concealed, social presence was likely high in the non-anonymous *and* anonymous condition. Baptized and non-baptized students completed the experiment in one room. Baptized students must have heard the non-baptized student enter the room, and all participants were possibly aware of each other's typing (i.e., keyboard sounds). Moreover, the contact experience was not standardized. *Social information processing theory* states that in order to cope with the lack of non-verbal, para-verbal, and extra-verbal cues in CMC, individuals adapt "their linguistic and textual behaviors to the solicitation and presentation of socially revealing, relational behavior" (Walther, Anderson, & Park, 1994, p. 465). Although we ensured that participants did not discuss off-topic, we did not control for or intervene if students shared intimate and personal details in the text-chat. Further, as out-group members' perceived (low) social presence was not examined explicitly, these dynamics could not be captured in Study 1.

Also, we did not record whether students who were non-anonymous were recognized by or known to their interaction partner. Working with an out-group member with whom one had previous contact or established a friendship could have enforced her/his perceived social presence and artificially decreased prejudice ratings. If those effects had, however, impacted our findings, we would expect a pronounced effect of the experimental manipulation, which was not supported. Lastly, the main effect of CMIC on reduced prejudice was only shown for the majority group. There are several possible reasons for this result. First, the assessed out-group attitudes were not equally addressed during the intergroup contact experience. The collaborative task—focused on how to prepare for exams by using Facebook—may have emphasized that non-baptized students are serious, study a lot, and are not social, while demonstrating that baptized students are not just partying and also keen to focus on their

studies. Moreover, initial out-group attitudes were less negative for baptized than for non-baptized students (see Table 1), thus for baptized students CMIC we might not have been able to capture further improvement of out-group attitudes. Importantly, and while this explanation is certainly plausible, it should be noted that in this study the dependent measures were not the same for both groups, which does not make it possible to truly compare the outcomes of CMIC for baptized and non-baptized students.

2.2 Study 2

To address the limitations of Study 1, we developed a follow-up experiment that investigated the impact of computer-mediated intergroup contact on inter-university relations. The study was conducted at a university in South-East England (University A), and we examined participants' attitudes towards students at one of the oldest and most prestigious universities in the country (University B). There exists no explicit conflict between both universities, but clear status differences prevail. The study was approved by the institutional ethics boards of both universities.

We extended Study 1, first, by standardizing the CMIC. A confederate acted as the out-group member from University B. Thereto, we contacted four students at University B and asked them to provide in open text format examples of customs, activities, and events that were unique to their university. Based on this information, we developed a script with ten sets of questions and answers that were used by the confederate in all interactions; ten optional responses were prepared to address questions by the participant (Appendix). We further improved the CMIC discussion topic. Students were asked to collect ideas for a cultural event that was to take place at both universities, and they had to agree on how the event could be organized. Support from the university vice chancellors was promised. This scenario should have emphasized collaboration towards a common goal, equal status—independent of their university affiliation all students should have ideas—and authority

support. We were confident that it was less likely that group specific stereotypes would be evoked through the discussion of cultural events. In line with White and colleagues' (2012; 2014; White, Abu-Rayya, et al., 2015) successful dual-identity e-contact paradigm, we also emphasized a superordinate group. Students were informed that they all belong to the planning committee of the event. Importantly, we examined out-group members' perceived social presence as well as evaluations of the contact experience. We also introduced measures of prejudice that had been established in previous research.

2.2.1 Method

2.2.1.1 **Participants and Design.** Thirty-seven ($N = 37$) first-year psychology students affiliated with University A completed the study for course credit. Students were on average $M_{age} = 20.19$ ($SD_{age} = 4.89$) years old; 87% were female, 62% spoke English as their native language, and 57% were British. Study 2 differed from Study 1 in that we did not manipulate out-group members' anonymity independently of anonymity of the self. Since students worked with a confederate, their own anonymity did not affect the study design as was the case in Study 1. In addition, we did not postulate that participants' anonymity ought to influence their attitudes towards out-group members. In order to give students from University A a realistic impression of the CMIC, we matched their anonymity with that of the out-group confederate. In the non-anonymous condition, participants' and out-group confederates' gender was matched. We applied a 2 (anonymity of out-group confederate/self: anonymous/not) x 2 (time of rating out-group attitudes: before/after CMIC) mixed-factorial design with $N = 20$ students in the anonymous and $N = 17$ students in the non-anonymous condition.

2.2.1.2 **Procedure.** Students participated individually on a personal computer, seated in a closed cubicle. In the non-anonymous condition students had their picture taken and name entered in the chat software; in the anonymous condition they worked with a chat

profile that included a black square where the photo should be and an arbitrary user name. After completing a questionnaire, participants were asked to join a synchronous text-chat with a student from University B in order to develop ideas for a cultural event. We used the same chat software as in Study 1. The CMIC lasted for 15 minutes after which participants completed a second questionnaire and were debriefed. The debriefing emphasized the points described in Study 1.

2.2.1.3 **Materials.** Students provided *demographic information*, including their age, gender, mother tongue, and nationality. Unless otherwise indicated the following measures were taken on a 7-point scale (1 = *not at all;* 7 = *completely).* *In-group identification* (Krizan & Baron, 2007; 'I am similar to other students at the University A.', 'I share many attitudes and values with other students at the University A', 'I consider myself as a typical student of the A'*; α =* .80), frequency of *previous out-group contact* (1 = *never*; 7 = *frequently*), and *intergroup anxiety* (Hewstone & Voci, 2003; five items, e.g., 'Awkward', 'Happy', 'Relaxed'; *α* = .82) were assessed before the computer-mediated intergroup contact.

Before and after the CMIC, students reported their *identification with the superordinate group* (e.g., 'I am similar to other members of the planning committee.'; pre *α* = .79; post *α* = .91). Students further expressed *attitudes towards the out-group* on a feeling thermometer (see e.g., Hewstone, Judd, & Sharp, 2011; 0°C = *least warm*; 100°C = *most warm*) as well as *positive attitude forecasting* (before the CMIC) and *positive explicit out-group attitudes* (after the CMIC) on a three-item scale ('I think I (will) really like students from the University B', 'I think students from the University B are really friendly.', 'I would not trust students from the University B' (reversed); pre *α* = .85; post *α* = .68).

After the CMIC, a *manipulation check* assessed to what degree 'The student from University B appeared personally identifiable'; we further asked participants to what degree their identity was revealed to the student they were chatting with. *Social presence* of the out-

group member was examined with six items (Park & Sundar, 2015; Rüggenberg, 2007; e.g., 'The other student was involved in the chat', 'The other student created a sense of distance between us' (reversed), 'The other student made the chat seem superficial' (reversed); α = .72). Participants further indicated how *they evaluated the interaction* ('Interesting', 'Satisfying', 'Cheerful', 'Involving'; α = .87) and, on one item, how *interested they were in meeting the student* from University B in person.

2.2.2 Results and Discussion

2.2.2.1 **Manipulation Check.** Perceived identifiability of the out-group member ($F(1, 35) = 41.70$, p = .00, η^2 = .54) as well as identifiability of the self ($F(1, 35) = 38.81$, p = .00, η^2 = .53) were increased in the non-anonymous condition (Table 3).

2.2.2.2 **Effects of CMIC Over Time.** Replicating previous research and Study 1, feelings of warmth towards the out-group were significantly enhanced after the CMIC ($F(1, 36) = 51.10$, p = .00; η^2 = .59) as were explicit positive attitudes ($F(1, 36) = 7.69$, p = .00; η^2 = .17). Moreover, identification with the superordinate group increased over time ($F(1, 36) = 14.22$, p = .00; η^2 = .28) (Table 3). No interaction effects of gender or students' nationality, being British or non-British, were observed (Appendix).

—Insert Table 3 here—

2.2.2.3 **The Role of Anonymity.** To examine Hypotheses 1 and 2, that is, out-group members' anonymity during CMIC facilitates prejudice due to reduced social presence, we tested a mediation model (Hayes, 2012; model 4). We specified a carryover effect from out-group members' anonymity on reduced social presence, and from reduced social presence on less warm feelings towards the out-group as well as less positive explicit out-group attitudes. Contemporary approaches to mediation analysis do not require a significant effect of the

independent on the dependent variable; instead they assess the significance of the indirect path (Hayes, 2009). Indeed, indirect effects may be observed even in the absence of direct effects (see Rucker, Preacher, Tormala, & Petty, 2011). We used a SPSS macro to test the mediation (Hayes, 2012); applying the default bootstrapping procedure a path is considered significant if the 95% bias corrected confidence intervals (CIs; based on 10 000 samples) do not include zero.

Power analyses with G*Power 3.1 sensitivity analysis (Faul et al., 2007) showed that for the sample size of $N = 37$ (two groups), an $\alpha = .05$, and power $(1-\beta) = .80$ moderate effects (d = .34; outgroup feelings; d = .40 explicit outgroup attitudes) of repeated measures within-between interactions could be detected. Nevertheless, and contrary to Hypothesis 1, the direct effects of out-group members' anonymity on less warm feelings towards the out-group (B = .16, SE = 5.03, CI 95% [-10.07; 10.38]) and positive explicit out-group attitudes (B = .34, SE = .24, CI 95% [-.15; .82]), controlling for pre-CMIC measures of the dependent variables, were not significant. TOST equivalence tests[1] based on Welch's t-test were conducted, applying equivalence bounds based on Cohen's d = -.50 and d = .50. Results indicated that for the dependent variable 'out-group feelings' the observed effect size (d = 0.03) was not significantly within the equivalent bounds (in raw scores: -11.2 and 11.2), $t(30,60) = -1.42$, $p = .08$. Further analysis including the dependent variable 'explicit out-group attitudes' showed as well that the observed effect size (d = .39) was not significantly within the equivalent bounds (in raw scores: -.56 and .56), $t(28,96) = -.35$, $p = .36$. In conclusion, the H_0 that a true effect is present was not rejected.

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[1]   Lakens (2017) proposed that if non-significant effects are identified it should not be automatically concluded that there is no meaningful effect. Instead equivalence tests, such as the two-one-sided t-tests (TOST), should be conducted in order to reject effects that are more extreme than specified lower and upper bounds. The equivalence bounds are derived from the smallest effect size that is of interest for a research question. If an observed effect is within the lower and upper bound they "are deemed equivalent to the absence of an effect that is worthwhile to examine" (Lakens, 2017, p. 5). When conducting TOST, the H_0 states that a true effect is present, while the H_1 proposes the absence of an effect that, considering the specified equivalence bounds, is meaningful to be examined.

Importantly, results of the mediation analyses were consistent with Hypothesis 2. The indirect effect of the experimental manipulation on feelings of warmth, mediated by reduced social presence and controlling for pre-CMIC ratings of the dependent variable, was significant (B = -3.59, SE = 2.21, CI 95% [-9.69; -.48]). In addition, the indirect effect of the experimental manipulation on less positive explicit out-group attitudes, mediated by reduced perceived social presence and controlling for positive attitude forecasting, was significant (B = -.19, SE = .10, CI 95% [-.45; -.04]; Figure 1). The analyses point to the central role of perceived social presence in shaping out-group attitudes in computer-mediated intergroup contact.

—Insert Figure 1 here—

In order to gain a deeper understanding of these dynamics, we conducted supplementary analyses with serial mediators (Hayes, 2012; model 6). Results highlighted that reduced social presence, due to out-group members' anonymity, undermined positive contact experiences; students evaluated the text-chat with a less socially present out-group member as less interesting, satisfying, cheerful, and involving, which in turn was associated with reduced warm feelings towards the out-group (B = -5.24, SE = 3.22, CI 95% [-14.10; -.62]) and less positive explicit out-group attitudes (B = -.24, SE = .13, CI 95% [-.60; -.03]) (Figure 2). Finally, we explored the relation between computer-mediated intergroup contact and willingness for direct contact: Out-group members' anonymity during CMIC undermined participants' willingness to meet the out-group member in person by reducing perceived social presence and thereby decreasing warm feelings towards the out-group (B = -.20, SE = .17, CI 95% [-.88; -.01]) as well as positive explicit out-group attitudes (B = -.18, SE = .15, CI 95% [-.72; -.01) (Figure 3).

—Insert Figure 2 here—

—Insert Figure 3 here—

3.1 General Discussion

We presented two experiments emphasizing that computer-mediated intergroup contact can reduce negative out-group sentiments. We further partially supported the contention that this effect is reversed if the tools and platforms that enable the CMIC suppress out-group members' perceived social presence. Below we summarize and discuss the unique contribution of our work, its limitations, as well as directions for future research and practical implications.

3.1.1 The Merits of Computer-mediated Intergroup Contact

In line with previous studies (e.g., Alvídrez, et al., 2015; Schwab & Greitemeyer, 2015; Tynes et al., 2008; Walther et al., 2015; White et al., 2014), we showed that computer-mediated intergroup contact reduces explicit negative out-group attitudes (Study 1), increases warm feelings towards the out-group (Study 2), and fosters explicit positive out-group attitudes as well as identification with a superordinate group (Study 2). While Study 1 demonstrated this positive effect only for the majority group (see Tropp & Pettigrew, 2005), we replicated the finding in Study 2 also for students who belonged to a university of relatively lower status than the salient out-group.

The effect of CMIC on prejudice was, in fact, comparable to what has been reported for direct intergroup contact in a meta-analysis ($d = .40$; Pettigrew & Tropp, 2006). With this in mind, computer-mediated intergroup contact can be considered as a valuable alternative when face-to-face encounters are not (yet) feasible or desirable. And CMIC might even offer a stepping-stone towards meeting the out-group in person. Study 2 provides empirical

evidence that working with an identifiable out-group member on a collaborative task online enhanced the willingness to meet her/him again face-to-face, offline. Hence, successful intergroup contact may develop as a sequential process, during which the impact of different types of out-group encounters unfolds over time (Crisp & Turner, 2009).

3.1.2 Anonymity and Social Presence in Computer-Mediated Intergroup Contact

Previous research on computer-mediated communication has suggested that users' anonymity online could promote hostility, derogation, and deviant behavior (Douglas & McGarty, 2001; Zimbardo, 1969); anonymity should have a dis-inhibitory effect, resulting in a lower sense of accountability and reduced self-awareness (*deindividuation theory;* Postmes, 2007; Spears & Postmes, 2015; see Postmes & Spears, 1998, who failed to confirm this relation in a meta-analysis). We pointed out that in addition to anonymity of the self, interaction partners' anonymity should be considered as a factor that can facilitate prejudice.

Specifically, our conclusions allude to the central role of interaction partners' perceived social presence. Study 2 showed that intergroup contact during which out-group members concealed individuating information reduced their perceived social presence; they were viewed as less interested in the interaction, as more superficial, and as if they created distance. Out-group members' reduced social presence further was associated with negative out-group attitudes, notably because the intergroup interaction itself was considered as less interesting, satisfying, cheerful, and involving (Gunawardena & Zittle, 1997; Hostetter & Busch, 2006; Richardson & Swan, 2003; Roberts et al., 2006). It must be noted that in both studies, we encouraged equal status during the computer-mediated intergroup contact as well as collaboration towards a common goal, and authority support (Allport, 1954). If perceived social presence was low, the benefits of these conditions were, however, overshadowed.

The (sequentially) mediated negative influence of anonymity on out-group attitudes (Study 2) did explain a substantial percentage of variance. Nevertheless, it remains to be

explored why the present results did not support the direct impact of out-group members' anonymity on prejudice. We certainly must acknowledge that the sample size was fairly small in both studies, which may have resulted in underpowered analyses. At the same time, using a pre-post design allowed us to maintain power. Rather than insisting that the (lack of a) finding represents a fortuitous statistical artefact, it is possible that we failed to observe a direct effect of the experimental manipulation due to the presence of two opposing indirect effects (Rucker et al., 2011). In other words, it may be speculated that out-group members' anonymity contributed to conditions that simultaneously facilitated *and* reversed the prejudice-reducing effect of intergroup contact.

That is, it has been shown that anonymity enforces the "accessibility of contextually relevant identities" (Spears, Postmes, Lea, & Wolbert, 2002, p. 95). Given that a social identity is salient—being explicitly stated or contextually derived—the limited availability of interpersonal cues and obscured individual differences of interaction partners enhances the salience of the respective in- and out-group memberships (Postmes et al., 1998). Although intergroup contact takes place between individuals, for it to affect opinions towards the whole out-group, encounters should occur precisely in such an intergroup context (Hewstone & Brown, 1986). Thus, anonymity may prompt negative out-group attitudes by undermining interaction partners' social presence *as well as* reduce prejudice by fostering group salience. To examine and disentangle these effects, we recommend future studies to manipulate the mediators of social presence and group salience.

In sum, the results point out that affordances of CMC can shape the potential impact of computer-mediated intergroup contact. We do not, however, argue for a technology-deterministic view; communication media in itself does not enhance or worsen intergroup relations. We seek to highlight that characteristics of the tools and platforms that enable CMIC can shape interaction partners' perceived social presence and the nature of interactions.

Ultimately, media affordances must align with the requirements of successful—that is, intimate and positive—intergroup contact in order to reduce prejudice (*media-ecological framework*; Döhring, 2003).

3.1.3 Limitations and Future Directions

Notwithstanding the achievements of this research, we must discuss certain limitations, which should be addressed in future research. As has been the case in many experimental intergroup contact studies (e.g., Cameron, Rutland, & Brown, 2007; Houlette et al., 2004), ours included only one contact session, in the laboratory, and participants immediately completed the post-test. This means that we cannot estimate the long-term impact of computer-mediated contact interventions. Findings from White and colleagues (2014) are promising in this regard; they showed that one year after the eight-week program of computer-mediated intergroup contact, intergroup bias was further reduced.

In addition, we focused on the role of anonymity as an affordance of CMC that is most distinct from face-to-face interactions. The influence of other characteristics of computer-mediated communication media were not explicitly captured. Both experiments applied synchronous text-chat where students received immediate responses to their comments. If the anonymous contact had been, for instance, asynchronous, prejudice may have been increased more strongly as perceived social presence is likely further reduced in these settings. In order to address the unique contributions of further qualities of computer-mediated communication it would therefore be valuable to manipulate its impact independently. Moreover, the information that is exchanged during intergroup interactions can further attenuate or mitigate the effects of affordances of CMC on prejudice. The present research did not take this point into account; Study 1, however, suggested that social presence is possibly not only established by design elements of computer-mediated communication. Indeed, sharing personal and intimate information during a conversation may compensate for

the lack of individuating cues (Walther et al., 1994), and researchers should further explore communicative dynamics of intergroup contact (Harwood, 2010). Analysis of language style characteristics thus provides an interesting perspective. Individuals' language style indicates how they aim to present themselves and manage relationships with others (Pennebaker, Mehl, & Niederhoffer, 2003). In order to evoke closeness and immediacy (Pennebaker & King, 1999) individuals use, for instance, "concrete, personal, involved, experiential language with a focus on the here and now" (Borelli, Sbarra, Mehl, & David, 2011, p. 343); they use more first person singular pronouns (I, me, and my), more present tense verbs, more conditional tenses (e.g., could, should, and would), fewer long words, and fewer articles.

3.1.4 Practical Implications

While academic research on CMIC is still limited, computer-mediated intergroup contact has been frequently included in conflict resolution interventions, in particular in the Middle East (Hoter et al., 2009; Kampf & Cuhadar, 2014; McKenna et al., 2009; Yablon & Katz, 2001; Yablon, 2007). This may come as no surprise. Organizing intergroup encounters online likely entails lower financial and organizational costs than face-to-face exchanges (Amichai-Hamburger & McKenna, 2006). Importantly, individuals might be more easily motivated to engage with an out-group member in an online context or through digital tools that they are familiar with and use daily. Our results highlight that interventions that draw on CMIC can certainly be effective in addressing negative sentiments towards other social groups. We must note, however, that such initiatives should rely on communication media that encourages interaction partners' social presence. This may be most easily achieved by sharing individuating cues, photos and biographic information, in the form of profiles or wikis. If this is, for example, for security reasons, not possible, conversation topics should encourage self-disclosure and interaction partners should be reminded to use a language style that emphasizes the presence, is concrete and personal.

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Tables

Table 1. *Means and standard deviations of key variables*

Variable	*M*	*SD*	*M*	*SD*
In-group Identification	*Baptized*		*Non-baptized*	
	4.78	1.72	4.78	1.70
Explicit Negative Out-group Attitudes	*Time 1*		*Time 2*	
by Non-Baptized students				
Not successful at university	4.03	1.09	3.56	.95
Dirty	4.72	1.59	3.88	1.43
Alcoholic	4.84	1.11	4.25	1.32
Cliquey	5.66	1.04	5.41	1.01
Only wanting to have a good time	6.22	.75	5.78	.83
by Baptized students				
Serious	4.91	1.00	4.69	1.00
Uptight	3.56	1.22	3.41	1.16
Not interested in having a good time	3.34	1.15	3.41	1.29
Introverted	3.72	1.11	3.75	1.05
Too focused on their studies	4.91	.73	4.81	.93

Table 2. *Between-subject effects of anonymity of the self and the out-group member on negative out-group attitudes*

Variable	Interaction	Interaction	Interaction
Evaluations by Non-Baptized students	*Time x Anonymity of self*	*Time x Anonymity of Out-group member*	*Time x Anonymity of self x Anonymity of out-group member*
Not successful at university	$F(1, 28) = .40, p = .53, \eta^2 = .01$	$F(1, 28) = .40, p = .53, \eta^2 = .01$	$F(1, 28) = .78, p = .38, \eta^2 = .03$
Dirty	$F(1, 28) = .29, p = .59, \eta^2 = .01$	$F(1, 28) = .29, p = .59, \eta^2 = .01$	$F(1, 28) = .11, p = .75, \eta^2 = .00$
Alcoholic	$F(1, 28) = 1.16, p = .29, \eta^2 = .04$	$F(1, 28) = .59, p = .45, \eta^2 = .02$	$F(1, 28) = .21, p = .65, \eta^2 = .01$
Cliquey	$F(1, 28) = .08, p = .79, \eta^2 = .03$	$F(1, 28) = 1.89, p = .18, \eta^2 = .06$	$F(1, 28) = 1.89, p = .18, \eta^2 = .06$
Only wanting to have a good time	$F(1, 28) = .00, p = 1, \eta^2 = .00$	$F(1, 28) = .77, p = .39, \eta^2 = .03$	$F(1, 28) = .30, p = .59, \eta^2 = .01$
Evaluations by Baptized students			
Serious	$F(1, 28) = 5.84, p = .02, \eta^2 = .17$	$F(1, 28) = 2.37, p = .14, \eta^2 = .08$	$F(1, 28) = .05, p = .83, \eta^2 = .00$
Uptight	$F(1, 28) = .43, p = .52, \eta^2 = .02$	$F(1, 28) = 2.33, p = .14, \eta^2 = .08$	$F(1, 28) = .05, p = .83, \eta^2 = .05$
Not interested in having a good time	$F(1, 28) = 1.74, p = .20, \eta^2 = .06$	$F(1, 28) = .43, p = .52, \eta^2 = .02$	$F(1, 28) = .98, p = .33, \eta^2 = .03$
Introverted	$F(1, 28) = .35, p = .56, \eta^2 = .01$	$F(1, 28) = .35, p = .56, \eta^2 = .01$	$F(1, 28) = .04, p = .85, \eta^2 = .00$
Too focused on their studies	$F(1, 28) = 1.28, p = .27, \eta^2 = .04$	$F(1, 28) = .46, p = .50, \eta^2 = .02$	$F(1, 28) = 4.14, p = .051, \eta^2 = .13$

Appendix

Table A.1. Results of G*Power sensitivity analysis for all dependent variables (Study 1)

Variable	Correlation Pre-Post Measure	Effect size d
Non-baptized students attitudes		
Not successful at university	.11	.48
Dirty	.42	.42
Alcoholic	.58	.40
Cliquey	.23	.52
Only wanting to have a good time	.49	.44
Baptized students' attitudes		
Serious	.62	.38
Uptight	.77	.28
Not interested in having a good time	.62	.38
Introverted	.68	.34
Too focused on their studies	.54	.40

Table A.2. Considering gender as a further between-subject factor in the repeated measures analysis (Study 1)

Variable	Interaction Time x Gender
Non-baptized students' attitudes	
Not successful at university	$F(1, 24) = 2.53, p = .13, \eta^2 = .10$
Dirty	$F(1, 24) = .63, p = .44, \eta^2 = .03$
Alcoholic	$F(1, 24) = .27, p = .61, \eta^2 = .01$
Cliquey	$F(1, 24) = 1.06, p = .31, \eta^2 = .04$
Only wanting to have a good time	$F(1, 24) = .36, p = .56, \eta^2 = .02$
Baptized students' attitudes	
Serious	$F(1, 24) = .81, p = .38, \eta^2 = .03$
Uptight	$F(1, 24) = .11, p = .75, \eta^2 = .00$
Not interested in having a good time	$F(1, 24) = .01, p = .91, \eta^2 = .00$
Introverted	$F(1, 24) = .72, p = .41, \eta^2 = .03$
Too focused on their studies	$F(1, 24) = .12, p = .74, \eta^2 = .01$

Table A 3. Considering gender as a further between-subject factor in the repeated measures analysis (Study 2)

Variable	Interaction Time x Gender
Feelings of warmth	$F(1, 30) = 2.30, p = .14, \eta^2 = .07$
Explicit out-group attitudes	$F(1, 30) = 2.43, p = .13, \eta^2 = .08$
Identification with the superordinate group	$F(1, 30) = 1.34, p = .26, \eta^2 = .04$

Table A.4. Considering nationality (being British or not British) as a further between-subject factor in the repeated measures analysis (Study 2)

Variable	Interaction Time x Nationality
Feelings of warmth	$F(1, 30) = .00, p = .96, \eta^2 = .00$
Explicit out-group attitudes	$F(1, 30) = 2.76, p = .11, \eta^2 = .08$
Identification with the superordinate group	$F(1, 30) = 1.27, p = .27, \eta^2 = .04$

A. 5 Script for CMIC (Study 2)
Introduction
(anonymous condition): Hello, how are you? I'm a third year Biology student at Christchurch College. How about you?
(non-anonymous condition): Hello, how are you? I'm Will/Sue, I'm a third year Biology student at Christchurch College. How about you?

(Nice to meet you too.)
Do you have an idea what we could do?

Event Suggestions (A minimum of two suggestions were included in each chat)
We can organize a concert or play. Students from [University A] and [University B] could write a play together or compose some songs. And we could visit each other before the event for rehearsals, this could be a lot of fun! What do you think?

We have a cuppers match for plays, like an inter-college thing. It's usually for first year students. They write the script and then act it out at the Burton Taylor theatre.
That might be an option. Is there anything similar in [University A]?

In fact, I belong to the [University B] Union, it's a debating society and they organise all kinds of events. I could ask some people there for help.

We might be able to get sponsors for the drinks etc. When we do bobs in [University B], the colleges usually subsidize the drinks. We could ask them. How could we find sponsors in [University A]?

At Corpus Christi they have a tortoise race with a tortoise fair. Other colleges bring their tortoises and they put them in the middle of a circle made of lettuce leaves. Whichever tortoise arrives first at the lettuce leaves wins. I know this sounds ridiculous, but it's super fun!

Questions Concerning Event details (A minimum of two questions were included in each chat)
How much should we ask as an entrance fee?
How many people would you expect?
What kind of food could we serve? I guess it should be quick and easy to prepare.
Do you have a location in mind? Could we do it outside? In Oxford, we could do it at … .

Questions Concerning the Collaboration (All questions were included in each chat)
(beginning) What do you think about organising this kind of event together?
(middle) What would other students in Canterbury think about the event? Do you think they would come to a …?
(end) How do you think it will go when we organize this … together?

Endorsement messages (All endorsement messages were included in each chat)
That's a great idea!
I was thinking the same.
Yes, definitely.
Brilliant!

Critical Questions (Two critical questions were included in each chat)
I am not sure this would work.
Isn't this too complicated?
I wonder whether the university would like this idea.

Table 3. *Means, standard deviations, and correlations of key variables*

	Variable	Anonymous M (SD)	Non-anonymous M (SD)	1	2	3	4	5	6	7	8	9	10	11	12
	Identifiability of the self	4.90 (1.89)	1.65 (1.12)												
	Identifiability of the out-group member	4.70 (1.98)	1.47 (.62)												
1	Ingroup identification	4.75 (1.14)	4.50 (1.01)	1											
2	Frequency of previous contact	1.90 (1.29)	1.82 (1.55)	.06	1										
3	Social presence	5.47 (.70)	5.89 (.69)	.23	.14	1									
4	Willingness for direct contact	5.25 (1.29)	5.35 (1.97)	.36*	.11	.56**	1								
5	Out-group feelings Pre	60.85 (18.77)	57.65 (19.08)	.40*	.04	.28	.56**	1							
6	Out-group feelings Post	76.60 (19.83)	77.24 (24.70)	.36*	.20	.45**	.69**	.74**	1						
7	Explicit out-group attitudes Pre	4.88 (.93)	5.02 (1.29)	.05	.06	.41*	.37**	.51**	.50**	1					
8	Explicit out-group attitudes Post	5.38 (.76)	5.31 (1.15)	.32	.25	.53**	.58**	.50**	.70**	.63**	1				
9	Intergroup anxiety	3.87 (1.11)	3.48 (1.31)	-.28	-.25	-.55**	-.38*	-.32	-.42**	-.41*	-.35*	1			
10	Positive contact evaluations	5.49 (.93)	5.78 (1.06)	.41*	.16	.66**	.79**	.51**	.61**	.38*	.61**	-.49	1		
11	Identification with the super-ordinate group Pre	3.95 (.97)	4.04 (1.04)	.30	.32	.34*	.47**	.21	.41*	.32	.40*	-.45*	.47**	1	
12	Identification with the super-ordinate group Post	4.67 (1.37)	4.67 (1.07)	.39*	.29	.36*	.50**	.53**	.43**	.58**	.38*	-.40*	.56**	.52**	1

1.19 (*p* = .80)

| Condition | | -.46 (*p* = .0487) | Social presence | | 10.11 (*p* = .01) | Warm feelings towards out-group T2 | | R^2 = .65 |

.77 (*p* = .00)

Warm feelings towards out-group T1

.33 (*p* = .18)

| Condition | | -.40 (*p* = .08) | Social presence | | .45 (*p* = .01) | Explicit out-group attitudes T2 | | R^2 = .50 |

.47 (*p* = .00)
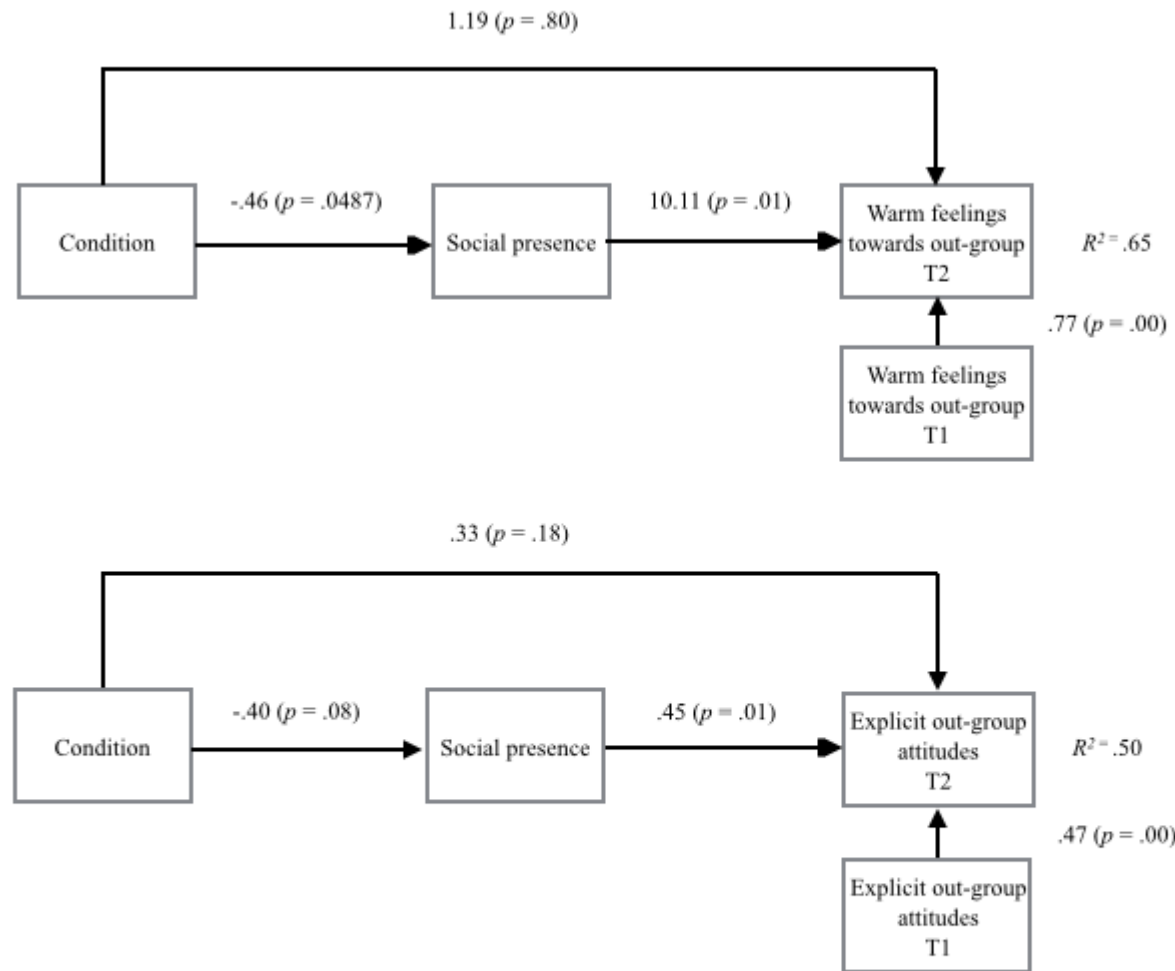
Explicit out-group attitudes T1

Figure 1. Direct and indirect effects of anonymity on out-group feelings and attitudes, mediated by perceived social presence

Note. Condition is coded dichotomously (0 = non-anonymous; 1 = anonymous)
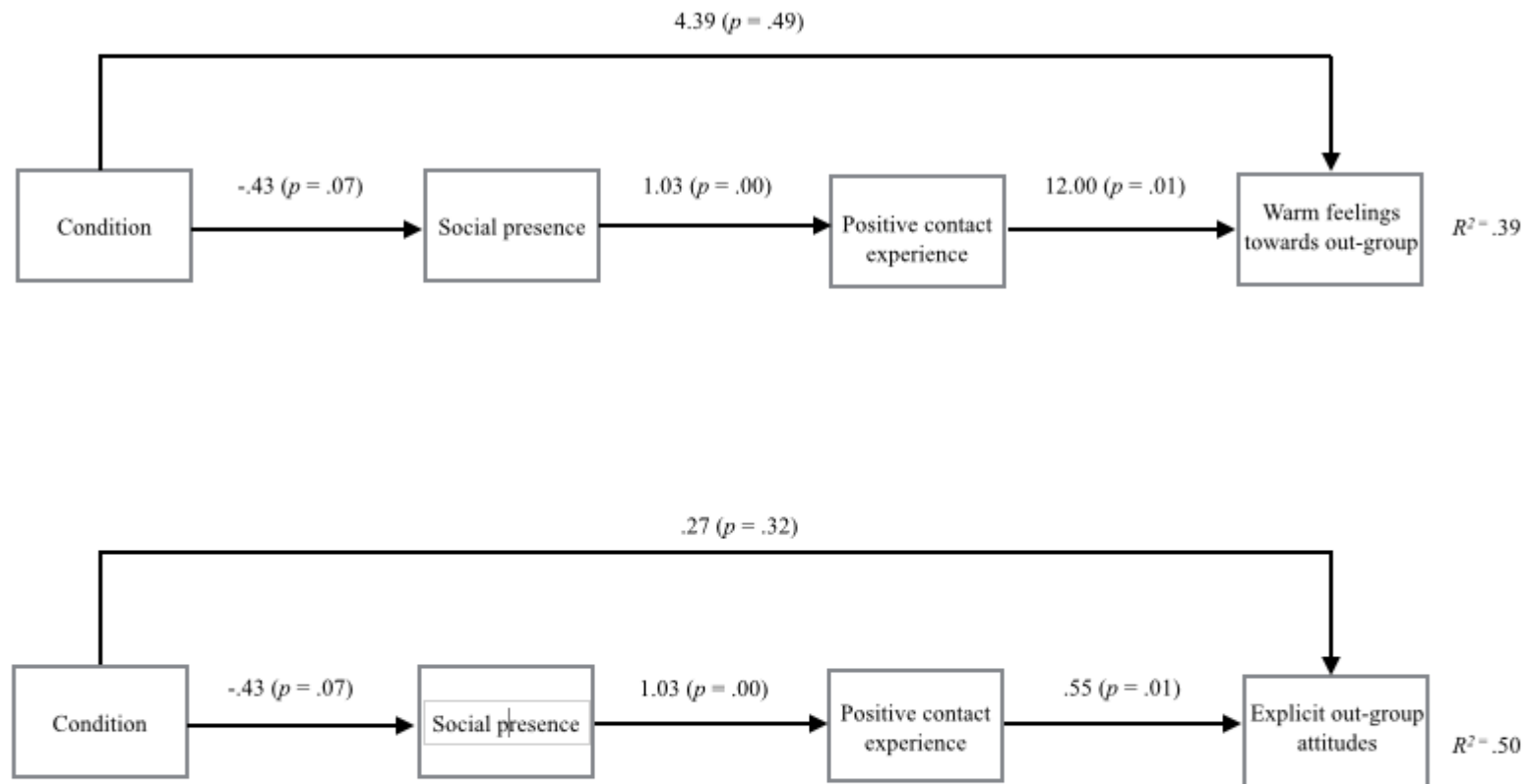
Figure 2. Direct and indirect effects of anonymity on out-group feelings and attitudes, mediated by social presence and contact quality

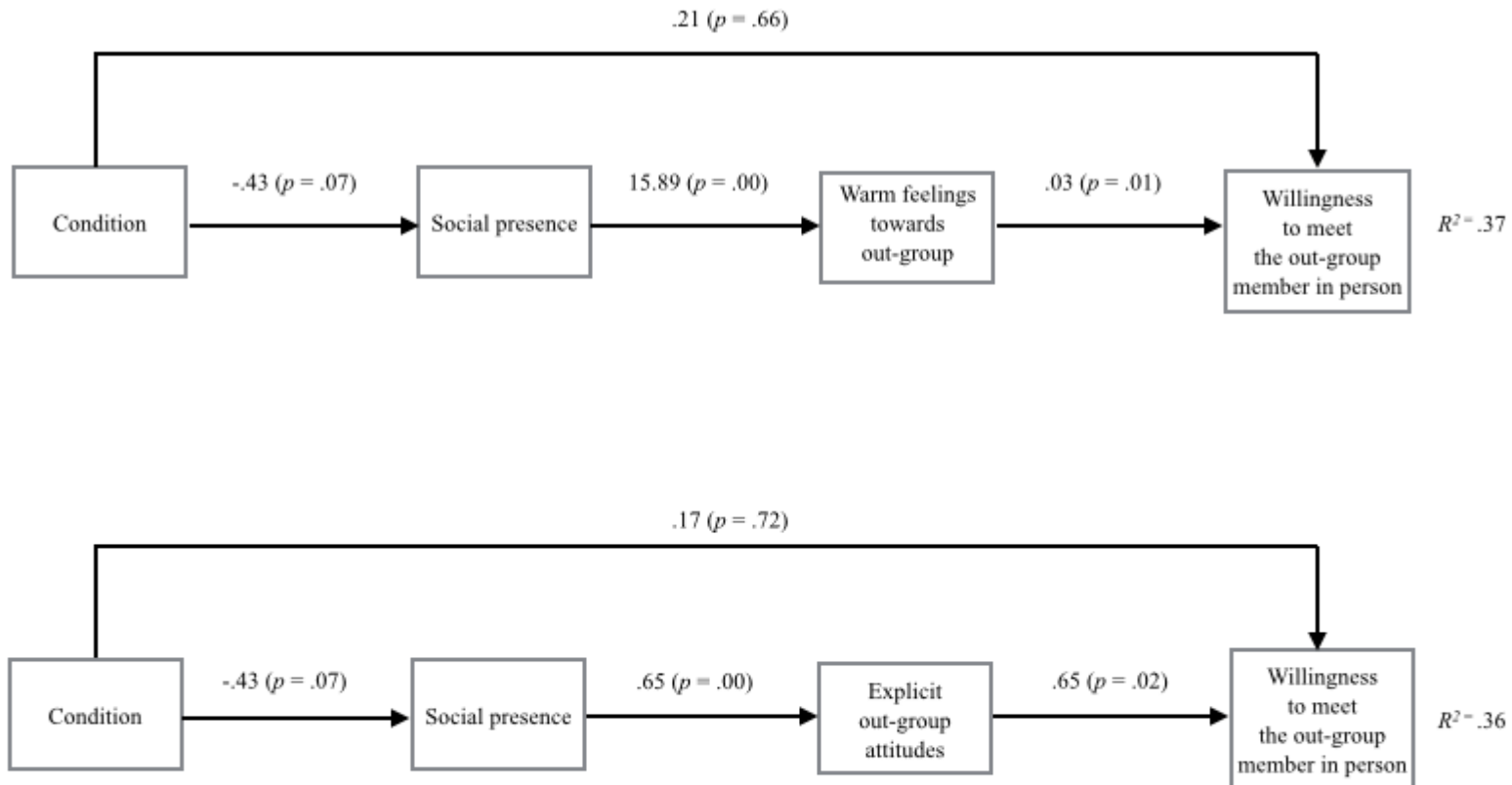Note. Condition is coded dichotomously (0 = non-anonymous; 1 = anonymous)

.21 (*p* = .66)

| Condition | −.43 (*p* = .07) | Social presence | 15.89 (*p* = .00) | Warm feelings towards out-group | .03 (*p* = .01) | Willingness to meet the out-group member in person | R^2 = .37 |

.17 (*p* = .72)

| Condition | −.43 (*p* = .07) | Social presence | .65 (*p* = .00) | Explicit out-group attitudes | .65 (*p* = .02) | Willingness to meet the out-group member in person | R^2 = .36 |

Figure 3. Direct and indirect effects of anonymity on willingness to meet the out-group in person, mediated by social presence and out-group feelings and attitudes

Note. Condition is coded dichotomously (0 = non-anonymous; 1 = anonymous)