

THE IMPACT OF ANONYMITY AND GROUP IDENTIFICATION ON PROGROUP BEHAVIOR IN COMPUTER-MEDIATED GROUPS

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To contribute to the examination of the effects of computer-mediated communication (CMC) on collaborative work, the impact of anonymity on willingness to exert effort on behalf of a group was examined. Two aspects of anonymity were independently manipulated: visibility of respondents (not visible, visible) and visibility of responses (not visible, visible) to the in-group. The role of degree of identification as moderator of anonymity effects was also examined. The results show that anonymity manipulations affect group members' effort on behalf of the group, but only when group identification is low. Low identifiers chose to work harder with the group either when they were totally anonymous or when they were totally visible to other in-group members. The implications of the results for the understanding of group processes through CMC are discussed.

Reliance on computer support systems to carry out collaborative or group tasks is fairly common nowadays. The question raised by the increased reliance on these media is what effect it has on a group's ability to perform a given task successfully. Clearly, a group's success on a given task depends on a variety of factors, one of these being the extent to which group members are willing to

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exert themselves on behalf of the group's goals. In this article, we examine the impact that computer-mediated communication (CMC) is likely to have on the effort that individual group members exert on behalf of the group. In particular, we examine how various types of anonymity that may accompany situations of group CMC can affect group members' willingness to work on behalf of the group. Moreover, we investigate how these effects can be moderated by the degree to which group members identify with the group.

One of the ongoing debates that surround the impact of CMC in modern societies is whether it promotes a disregard for collective norms and values due to the anonymity that it provides to its users. In fact, the investigation of the effects of anonymity or identifiability on adoption of group norms has revealed that anonymity may decrease normative displays (e.g., Abrams, Wetherell, Cochrane, Hogg, & Turner, 1990; Batson et al., 1999; Noel, Wann, & Branscombe, 1995; Postmes & Spears, 2000). As a consequence, researchers have generally been rather pessimistic as to the effect that CMC is likely to have on group processes (Jessup, Connolly, & Tansik, 1990; Kiesler, Siegel, & McGuire, 1984). However, more recent research has revealed that anonymity can also increase the adoption of group norms (e.g., Lea, Spears, & De Groot, in press; Postmes & Spears, 2000; Reicher, 1984; Reicher, Spears, & Postmes, 1995; Spears & Lea, 1994; Spears, Lea, & Lee, 1990; for reviews, see Postmes, Spears, & Lea, 1998, 1999). The question thus seems to be, What are the conditions under which anonymity associated with CMC serves to promote progroup behavior, rather than undermine it?

Recently, a theoretical model has been developed with the aim of accounting for the variety of effects of anonymity on group members' responses: the Social Identity Model of Deindividuation Effects (SIDE) (Reicher et al., 1995; Spears & Lea, 1994). This is done by combining self-presentational approaches (Baumeister, 1982; Goffman, 1959; Leary & Kowalski, 1990; Schlenker, 1980) with social identity accounts of social influence (Tajfel, 1978; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). In particular, this model postulates two components of anonymity effects, which

are associated with the particular ways in which anonymity is manipulated: a cognitive component and a strategic component.

According to the SIDE model, the cognitive component of anonymity manipulations corresponds to the level of salience of a given self-category, and is associated with manipulations that vary the extent to which individuating information about other group members is available. These manipulations have ranged from showing pictures or disclosing personal biographies, to varying whether participants work in isolation or in each other's presence. By enhancing focus on individual differences within the group, these manipulations decrease salience of group membership and result in decreased endorsement of group norms (for reviews, see Postmes et al., 1998, 1999). The cognitive effect may be illustrated by the finding that group members tend to follow group norms more closely when seated in separate cubicles than when facing each other in the same room (e.g., Lea et al., *in press*; Spears et al., 1990).

Although the cognitive effect of anonymity has been the focus of some research, it is still unclear what are the conditions for its occurrence. According to the SIDE model, an effect of anonymity on cognitive salience of group membership relies on the availability of information that demonstrates within-group variability. So far, this has been taken to mean that a cognitive effect relies on visibility of group members to each other (i.e., they know who the other group members are). However, within-group variability can be demonstrated by other types of information besides group members' appearance, namely, by their attitudes and behaviors. Therefore, information regarding the behavior displayed by fellow group members in itself is likely to decrease salience of group membership, decreasing also endorsement of group norms. (Note, however, that this effect can only be obtained if the behavior displayed by fellow group members is characterized by some variability, as is likely to be the case in most group settings.)

To examine this process, we separately manipulated visibility of group members to each other (i.e., participants could or could not see who the other group members were) and visibility of their responses to the group (participants could or could not see the

responses given by other group members). We examined the effect of these factors on group members' choice to exert themselves on behalf of the group (following the group's norm). Consistent with the analysis made here of the effect of individuating information on cognitive salience of group membership, we expected greater endorsement of group norms in the condition where no individuating information was provided than in the conditions where participants could either see each other or each other's responses (because this information would reduce salience of group membership).

However, when both types of individuating information were provided (i.e., when participants could see each other and each other's responses), strong endorsement of group norms was also expected. This latter effect corresponds to the strategic component of the SIDE model. This component refers to the desire to behave in ways that secure a positive self-presentation and is associated with manipulations that vary whether participants can be matched with their responses (identifiability and accountability). Positive self-presentation may be attained by behaving in ways approved by the audience, and it can be threatened by behaving in ways of which the audience disapproves. For example, accountability to the in-group was shown to ensure expressions of progroup behavior, even among those group members who were not internally motivated to favor the group, as was evident from their private responses (Barreto & Ellemers, 2000b; for review, see Ellemers, Barreto, & Spears, 1999).

In sum, we expected more progroup effort (in line with the group norm) when no individuating information was provided (due to an increase in cognitive salience of group membership) and when respondents and responses were visible to the in-group (due to a concern with strategic self-presentation). Moreover, we expected degree of identification to function as a moderator of the effect of anonymity manipulations on progroup behavior (see also Barreto & Ellemers, 2000a).

Although the degree to which group members identify with a given group varies across contexts, within the same context it is possible to find group members who identify relatively weakly with their group, and group members who identify more strongly

with their group. Prior research has shown that degree of group identification is a strong predictor of group members' attitudes and behavior toward the group (e.g., Jetten, Spears, & Manstead, 1997; Kelly, 1993; Ouwerkerk, De Gilder, & De Vries, 2000; Spears, Doosje, & Ellemers, 1997; Wann & Branscombe, 1990). Of most relevance here, prior research has shown that high identifiers hold internalized motivations to favor their group, and consequently generally behave in line with group norms (for reviews, see Doosje, Ellemers, & Spears, 1999; Ellemers & Barreto, 2001; Spears, Doosje, & Ellemers, 1999). By contrast, low identifiers are generally more instrumentally inclined, behaving in line with the group norms only when that serves their individual interest (see also Barreto & Ellemers, *in press*).

On the basis of this analysis, we can predict that degree of in-group identification is likely to moderate the effects of anonymity on group members' behavior. Indeed, cognitive and strategic effects of anonymity are likely to have little to add to the preexisting willingness to benefit their in-group that is expected when identification with a group is high (Turner, 1991; Turner et al., 1987). However, self-presentation concerns may provide the instrumental (strategic) motivation needed to motivate low identifiers to attend to the group's goals (Barreto & Ellemers, 2000b). It remains nonetheless to be tested whether cognitive effects of anonymity are also moderated by degree of in-group identification. For that reason, in the study reported here, we have examined whether degree of identification moderates how cognitive and strategic processes associated with anonymity affect an individual group member's choice to work on behalf of the in-group.

In sum, we expected high identifiers to be consistent in their choice to exert themselves on behalf of the group's goals, irrespective of anonymity manipulations. By contrast, we anticipated anonymity to have an effect on the extent to which low identifiers benefit the group. Specifically, low identifiers were expected to work for the group when totally anonymous to the in-group and when totally visible to the in-group (identifiable). However, in line with this argument, the processes involved in these two conditions should be

of a quite different nature: We expected progroup responses in conditions of total anonymity to the in-group to stem from enhanced salience of the fact that one belongs to the group; hence, this condition should be associated with a private concern with the group's fate. However, progroup responses under conditions of total visibility are expected to emanate from a concern with one's own image toward other group members, and hence they should not be accompanied by a private concern with the group.

OVERVIEW AND HYPOTHESES

In this experiment, we investigated how manipulations of visibility of in-group members and their responses may independently affect the extent to which members of CMC groups are willing to exert themselves on behalf of the group. This resulted in four conditions: (a) participants could neither see each other nor each others' responses (total anonymity to the in-group); (b) participants could see each other, but not each others' responses (visible respondents, anonymous responses); (c) participants could not see each other, but they could see each others' responses (anonymous respondents, visible responses); and (d) participants could see each other and each others' responses (total visibility to the in-group). Moreover, to examine whether degree of identification with the in-group moderates the effect of these visibility manipulations, we divided participants into low and high identifiers on the basis of a median split on a scale of in-group identification. To examine group members' willingness to exert themselves on behalf of the group, we introduced false feedback establishing the group to have performed poorly and provided group members with an opportunity to contribute toward group or individual improvement. Support for a salience effect may be gathered if more progroup behavior is displayed under conditions of anonymity (Condition 1) than in conditions where individuating information is provided (Conditions 2 and 3). Moreover, support for a strategic effect is obtained if more progroup behavior is displayed when both types of individuating

information is provided (Condition 4) than where visibility is only partial (Conditions 2 and 3). Finally, support for the moderating role of degree of identification is obtained if cognitive and strategic effects are only revealed for low identifiers, whereas high identifiers should be more consistent in their responses across anonymity conditions.

To provide further insight into participants' private motivations, participants were also asked to indicate to what extent they were concerned with the group's improvement, and answers to this question remained confidential in all conditions. In line with the arguments presented above, we predicted that high identifiers would be consistently concerned with group improvement, whereas low identifiers would be more concerned with group improvement when no individuating information is provided (Condition 1: corresponding to an effect of anonymity on cognitive salience of group membership) than in any other condition.

METHOD

DESIGN AND PARTICIPANTS

The design of this study was a 2 (visibility of responses: not visible vs. visible) \times 2 (visibility of respondents: not visible vs. visible) \times 2 (degree of identification: low vs. high) between-subjects factorial. A total of 163 students of the Free University of Amsterdam took part in this experiment (118 women and 45 men, proportionally distributed across conditions). The mean age of the participants was 22 years. A minimum of 6 and a maximum of 15 participants were present at each experimental session. Because participants were seated in separate cubicles, they were not aware of how many people exactly were present in the laboratory. Each session lasted approximately 1.5 hours, after which all participants were fully debriefed and received book tokens for the amount of 15 Dutch guilders (approximately U.S. \$6.5).

PROCEDURE

Introduction and group formation. All participants in the conditions in which respondents would be visible to each other had their picture taken by the experimenter as soon as they arrived at the laboratory. Participants could see their own picture appear on the computer screen, and were thus led to believe that the pictures shown during the experiment corresponded to actual members of their group present in the laboratory. However, to ensure that participants would not be influenced by the particular faces shown on the screen, a prearranged set of 6 pictures (3 women and 3 men) was in fact used during the experiment. To ensure credibility of this manipulation in all sessions, care was taken that participants did not see each other. Participants were seated in separate cubicles and equipped with a personal computer. Instructions on how to use the computer were provided on the computer screen.

The experiment was introduced as an investigation into group problem solving. Reference was made to the inductive and deductive problem solving styles on the basis of which groups would be formed (Doosje, Spears, & Koomen, 1995). Participants were told that no differences had been found in the relative prevalence of inductive and deductive thinkers in the population, or across gender. It was stressed that at the individual level both problem solving styles were equally effective and that the purpose of this experiment was to investigate how efficient these styles would be at the group level. After performance of an "Associative Thinking Task," participants received (false) feedback regarding their membership in the group of inductive or deductive thinkers. In fact, all participants were classified as inductive thinkers. Participants were asked to indicate to which group they belonged on a form, a procedure that was also followed after providing feedback regarding group performance and group norm to ensure comprehension of the experimental setting. Subsequently, participants were asked to indicate on the computer to which group they belonged. When the answers did not coincide with the condition the participants had been assigned to, a correction appeared on the computer screen.

This procedure was followed for the manipulation of group membership and group performance. No check of the manipulations of visibility of responses and of visibility of respondents were included because these manipulations (i.e., presenting responses or pictures of in-group members on the computer screen) seemed self-evident. However, during debriefing, questions were posed to check for the credibility of these manipulations, on the basis of which two participants were excluded from the analysis.

At this stage, the computer allocated a code letter to each group member (in fact, all participants were assigned the letter F). Subsequently, degree of identification with the in-group was measured with three items, on the basis of which participants were divided into low and high identifiers through a median split (i.e., "At the moment I identify with the Inductive thinkers," "At the moment the Inductive thinkers are an important group for me," "Being an Inductive thinker is important for me at the moment," with answers given on 7-point scales ranging from 1 [*completely disagree*] to 7 [*completely agree*]: $\alpha = .84$, $Mdn = 3.00$; low identifiers: $M = 2.39$, $SD = 1.09$; high identifiers: $M = 3.95$, $SD = 1.18$; $F[1, 161] = 76.63$, $p < .001$).

Group performance feedback. Participants performed a group task, which consisted of a series of organizational dilemmas. For each dilemma, participants were asked to select one of two alternatives, only one of which was allegedly correct (see Ellemers, Wilke, & Van Knippenberg, 1993). In each of the dilemmas, after selecting one of the two alternative solutions, participants received feedback about other group members' answers and then selected their final answer. False feedback established that, in all conditions, the score of the in-group (28 points) was lower than both the score of another group (37 points) and the alleged norm score for the student population (33 points). The scoring procedures were deliberately kept ambiguous to ensure credibility of false feedback. This manipulation was checked by asking participants to indicate whether their group's score had been lower than, equal to, or higher than the other group's score. Again, when incorrect answers were given, corrections were provided.

Improvement possibilities. At this stage, participants were asked to perform a second task during which they would be given the opportunity to contribute to either individual or group improvement (see Barreto & Ellemers, 2000b). It was explained that participants could choose, in each of the seven trials of the second task, whether they wished to work individually or with the group. It was made clear that each time the participant chose to work individually, he or she would contribute to the improvement of his or her individual ability to work on group problem solving. In turn, each choice to work with the group would contribute to the improvement of the group's ability to work on group problem solving. In sum, in each of the seven trials, participants could choose to contribute either to the improvement of their own performance or to the improvement of the performance of the group.

Manipulation of visibility of responses. Half of the participants were told that when people work on group tasks they often do not know precisely what other members of their group are doing. To examine such a situation, in this second task participants would receive no information regarding the answers given by other group members, independently of whether they chose to work individually or with the group (response not visible). The remaining participants were told that when people work on group tasks they often know what some of the other team members are doing. To simulate such circumstances, in this second task, after each answer (to the organizational problem) and after each choice (to be tested individually or with the group) the computer would randomly choose one in-group member whose response would be displayed on the computer screen (response visible; e.g., answer: "Answer of Member G: 1," choice: "Choice of Member G: Work with my group"). Participants were also told that this procedure would be followed independently of whether they chose to work individually or with the group. It was emphasized that each participant would only be shown responses given by in-group members, and that no information would be provided concerning the responses of members of the other group, nor would the other group receive any information concerning the responses of members of their in-group. During the

task itself, the amount and quality of information given about the behavior of other in-group members was identical in all conditions where responses were visible. To ensure that this feedback would not alter the perception of group norm (compared to the conditions where responses were not visible), the choices shown corresponded to choices to be tested with the group. However, to ensure credibility of this manipulation and to provide the variability inherent to real group discussions, one choice to work individually was shown after Trial 5.

Manipulation of visibility of respondents. In addition, half of the participants were told that sometimes people are required to work with group members about whom they have little or no personal information, for instance, when group members work in organizations located in distant countries. To simulate such a situation, no personal information would be exchanged between the members of their group (respondents not visible). The other half of the participants were told that it is often the case that one has some personal information concerning the members of one's group, even when group members work in organizations located in distant countries. To simulate this situation, during the second task they would be able to see what their fellow group members looked like: after each answer and each choice the computer would randomly choose one in-group member whose digitized picture would be shown on the computer screen (respondents visible). It was emphasized that each participant would only be shown pictures of in-group members and that no pictures would be shown of members of the other group, nor would the other group be able to see pictures of members of their group.

In sum, in the conditions where neither responses nor respondents were visible, participants received no feedback after indicating their own responses. By contrast, when only responses were visible, participants first stated their own choice (to work individually or with the group), then they received feedback regarding the choice made by a randomly selected in-group member. Subsequently, they provided their own answer to the organizational

dilemma and finally received feedback regarding the answer given by the same randomly selected in-group member. A similar procedure was followed in the remaining conditions, except that instead of receiving feedback regarding the answers of an in-group member, participants were shown on the computer screen either only the picture of a randomly selected in-group member (response not visible, response visible) or both the picture of a randomly selected in-group member and his or her response (response visible, respondent visible).¹

Definition of group norm. In this study, we focus on the effect of these manipulations on the motivation to comply with group norms rather than on awareness of the group norm (Ajzen & Fishbein, 1980). For that reason, we attempted to make sure that all participants were equally aware of the group norm by providing explicit feedback about what the group considered an appropriate status enhancement strategy. To do so, after the procedure of the second task had been explained but before that task had actually been performed, participants were asked to indicate on a 7-point Likert scale ranging from 1 (*not at all*) to 7 (*very much*) to what extent they valued a group member who chooses to work individually (i.e., “I value a group member that focuses on his or her own possibilities and therefore chooses to work individually”) and a group member who chooses to work with the group (i.e., “I value a group member who focuses on the possibilities of the group and therefore chooses to work with the group”). Group norm was defined by providing feedback regarding the in-group’s evaluation of these two types of strategy. All participants were told that the group evaluated the choice to work with the group more positively than the choice to work individually (scores in 7-point scales: working with the group = 6.1, working individually = 2.4). This manipulation was checked with two items (manipulation check of norm: “If I had worked individually that would have upset the other members of my group” and “If I had worked with the group that would have upset the other members of my group”). At this stage, participants were asked to perform Task 2, where effort on behalf of the group was measured.

DEPENDENT MEASURES

Willingness to exert effort on behalf of the group. This was measured by scoring the choices made during Task 2 in the following manner: each choice made to work individually was given score 0 and each choice to work with the group was given score 1. Therefore, scores on this measure ranged from 0 (*choice to work individually on all trials*) to 7 (*choice to work with the group on all trials*) ($\alpha = .76$). After performance of Task 2, participants were asked to indicate on a 7-point Likert scale ranging from 1 (*not at all*) to 7 (*very much*) to what extent they were concerned with the improvement of the group (private concern with group improvement: "In this second part of the test I was more concerned with the performance of the group than with my own performance"). Answers to this question were anonymous irrespective of experimental conditions, to allow us to gain further insight into participants' private motivations.

RESULTS

MANIPULATION CHECKS

The manipulation checks of group membership and performance were all answered correctly, testifying to the success of these manipulations. Given the procedure followed to establish group norm, we expected participants to perceive the choice to work with the group to be preferred over the choice to work individually, irrespective of experimental condition. To check this manipulation, we conducted a 2 (visibility of responses: not visible vs. visible) \times 2 (visibility of respondents: not visible vs. visible) \times 2 (degree of identification: low vs. high) \times 2 (strategy: working individually vs. working with the group) ANOVA with repeated measures on the last factor, on participants' expectations regarding other group members' reactions to each work strategy. This analy-

sis only revealed the expected within subjects effect of strategy, $F(1, 155) = 122.21, p < .001$, indicating that participants perceived the choice to work individually ($M = 4.07, SD = 1.31$) to upset other group members significantly more than the choice to work with the group ($M = 2.46, SD = 1.15$), irrespective of the between-participants experimental manipulations.

CHOICE TO WORK WITH THE GROUP

We predicted that high identifiers' choices to work with the group would not be affected by the manipulations of visibility but that low identifiers would choose to work on behalf of the group more often when neither respondents nor responses were visible to the in-group (i.e., the cognitive effect) and when both respondents and their responses were visible to the in-group (i.e., the strategic effect). A 2 (visibility of responses: not visible vs. visible) \times 2 (visibility of respondents: not visible vs. visible) \times 2 (degree of identification: low vs. high) ANOVA on choices to work with the group revealed a marginally significant two-way interaction between visibility of respondents and visibility of responses, $F(1, 155) = 3.34, p = .07$, qualified by the predicted significant three-way interaction between degree of identification, and the two types of visibility, $F(1, 155) = 4.02, p < .05$. In line with our predictions, we investigated this three-way interaction further by examining the effects of the visibility manipulations for low and high identifiers separately. Consistent with our hypothesis, high identifiers' choices to work with the group were not affected by the manipulations of either type of visibility or of their interaction (overall $M = 4.27, SD = 2.22$). For low identifiers, the anticipated two-way interaction between visibility of respondents and visibility of responses was significant, $F(1, 84) = 8.88, p = .004$. Analyses of planned contrasts also revealed that low identifiers worked more with the group when neither respondents nor responses were visible to the in-group and when respondents and responses were visible to the group, as predicted, $t(64) = 2.95, p < .005$ (see Table 1).

TABLE 1: Effect of Visibility of Respondents and Visibility of Responses on Choices to Work With the Group, Among Low and High Identifiers

	<i>Degree of Identification</i>							
	<i>Low Identifiers</i>				<i>High Identifiers</i>			
	<i>Visibility of Respondents</i>							
	<i>Not Visible</i>		<i>Visible</i>		<i>Not Visible</i>		<i>Visible</i>	
<i>Visibility of Responses</i>	M	SD	M	SD	M	SD	M	SD
Not visible	5.26 _a	1.39	3.95 _b	2.44	4.24 _{ab}	2.44	4.52 _{ab}	2.27
Visible	3.96 _b	2.59	5.23 _a	1.45	4.05 _{ab}	2.19	4.22 _{ab}	2.13

NOTE: Scores range from 0 to 7. Only differences between means with different subscripts are significant ($t > 1, p < .05$).

PRIVATE CONCERN WITH GROUP IMPROVEMENT

The extent to which participants were concerned with the improvement of the group during Task 2 was analyzed with a 2 (visibility of responses: not visible vs. visible) \times 2 (visibility of respondents: not visible vs. visible) \times 2 (degree of identification: low vs. high) ANOVA. Note that responses to this item were anonymous for all participants to enable some insight into participants' private motivations. We predicted that high identifiers would be concerned with group improvement in all conditions, whereas low identifiers would be more concerned with group improvement when neither respondents nor their responses were visible to the in-group, than in any of the other three conditions. The predicted three-way interaction between degree of identification and the two types of visibility was revealed, $F(1, 155) = 4.67, p < .05$. We analyzed this three-way interaction further by separately examining low and high identifiers' reported concerns with group improvement. As predicted, high identifiers were equally concerned with the group across experimental conditions (overall, $M = 4.04, SD = 1.82$). Also as expected, for low identifiers, we obtained a main effect of visibility of responses, $F(1, 84) = 4.48, p < .05$, qualified by an interaction between visibility of responses and visibility of respondents, $F(1, 84) = 7.51, p < .01$. Analysis of planned contrasts revealed that low

identifiers were more concerned with the group when neither respondents nor responses were visible to the in-group ($M = 5.30$, $SD = 1.15$) than in any other condition (respondents not visible, responses visible: $M = 3.64$, $SD = 1.56$; respondents visible, responses not visible: $M = 4.29$, $SD = 1.93$; respondents and responses visible: $M = 4.50$, $SD = 1.74$), $t(59) = 3.6$, $p < .001$. That is, although there were two cells in which progroup behavior was observed among low identifiers, they reported greater concern with the improvement of the group under conditions of total anonymity to the in-group than in any other condition, whereas high identifiers were equally concerned with group improvement in all conditions, as predicted.

DISCUSSION

The results of this study indicate that contextual manipulations associated with anonymity may indeed affect collaborative work by influencing the extent to which group members are willing to work on behalf of the group's goals. Specifically, total anonymity to the in-group and total visibility to the in-group led to more progroup effort among group members that were weakly identified with the group. Taken together, these findings indicate that contextual features involved in CMC may affect how individual group members relate to the group, and therefore also the likelihood that the group may successfully attain its goals.

Generally, our findings are consistent with previous research within the SIDE model revealing the cognitive and strategic effects that may be associated with anonymity (for reviews, see Ellemers et al., 1999; Postmes et al., 1998, 1999). At the same time, our findings add to this literature in several ways. One novel aspect of our findings lies in the specification of degree of identification as a crucial moderator of these effects. Specifically, anonymity was only found to motivate lowly identified group members to work on behalf of their group, whereas high identifiers' motivation to work with the group was less dependent on the experimental circum-

stances. Further insight into group members' private motivations indicates that an increase in progroup effort among low identifiers was accompanied by greater private concern with the group's fate only when totally anonymous to the in-group, and not under total visibility to the in-group, whereas their overt behavior was identical in these two experimental conditions. This result is consistent with our hypothesis that different processes were responsible for the group loyalty displayed by low identifiers in these two conditions. Specifically, low identifiers' behavior under conditions of total anonymity to the in-group seems to have stemmed from an effect of anonymity on cognitive salience of group membership (which affected not only their behavior but also their private concern with the group's fate). By contrast, low identifiers' behavior under conditions of total visibility was not associated with greater private concern with the group and can therefore be attributed to a concern with positive self-presentation (see also Barreto & Ellemers, 2000b).

We acknowledge that the choices of those classified here as high identifiers (i.e., those that scored above the median on the identification scale) did not differ significantly from low identifiers nor were significantly above the mid-point of the scale. The low score on identification that our participants reported at the start of the experiment is likely to be responsible for this result. In fact, overall participants did not identify very strongly with the group in this study, which is not unexpected given that the groups employed in this study were artificially created and had an existence limited to the duration of the study. Had we given participants a greater opportunity to identify with their group (e.g., by performing tasks that would accelerate group formation or by using natural groups), the difference between low and high identifiers' behavior would have been more striking. As it is, low and high identifiers differed mainly in that low identifiers' motivation to work on behalf of the group was responsive to contextual manipulations, whereas high identifiers were more consistent in their behavior. Note also that although higher levels of identification would have likely led to higher scores on progroup behavior among high identifiers', based on prior research of strategic effects linked to anonymity manipulations

(Barreto & Ellemers, 2000b) we would have expected a similar absence of anonymity effects on high identifiers' behavior.

Our findings also add to existing literature on the effects of anonymity by specifying that individuation is not only linked with visibility of group members to each other but also with the availability of information about their attitudes or behavior. That is, information about other group member's behavioral choices can function so as to individuate them and consequently decrease salience of group membership. Clearly, this is only likely to be so when this information includes some variability, as in the setting studied here. By contrast, if group members behave in very similar ways (as in crowds and public demonstrations), then visibility of other group members' behavior is likely to further accentuate salience of group membership (e.g., Reicher, 1984).

It is worth noting here that visibility of group members' behavior can also function so as to increase group pressure by clarifying the group norm to which group members are expected to abide. Indeed, examinations of the effect of visibility of responses run the risk of confounding the cognitive effect of which we speak here with an effect on clarity of group norms.² Note, however, that this is not a valid concern in this study, as the group norm was made clear to participants in all conditions through an involving procedure deliberately aimed at controlling for these perceptions.

Given that anonymity is an important characteristic of CMC, these results suggest that the concerns usually voiced as to the undermining effects of CMC appear to be misplaced (e.g., Jessup et al., 1990; Kiesler et al., 1984; see also Postmes et al., 1998, 1999; Reicher et al., 1995; Spears & Lea, 1994). First, our results suggest that anonymity in CMC is not likely to affect those who are initially inclined to exert themselves in favor of the group. Second, the effects that may be elicited appear to promote rather than undermine progroup behavior, because they correspond to an increase in progroup effort among those group members who are the least inclined to work on behalf of the group. Whether this increase in normative expressions can serve as feedback into group members' sense of identification with the group is a question that further research should attempt to address.

NOTES

1. The focus of our research is on the effects of anonymity as symmetrical (referring to self and others). However, it is important to note that, strictly speaking, cognitive effects of anonymity manipulations only require visibility of other participants to the self, whereas strategic effects require only that the self be identifiable to others. For a discussion of this distinction and its implications, see Sassenberg (2000) and Douglas and McGarty (2001).
2. We are thankful to Leonel Garcia Marques for raising this issue.

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