

Social Identity as Social Glue: The Origins of Group Loyalty

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In 3 experiments, the authors investigated the role of social identity in fostering *group loyalty*, defined as staying when members can obtain better outcomes by leaving their group. In Experiment 1, high (vs. low) identifiers expressed a stronger desire to stay in the group in the presence of an attractive (vs. unattractive) exit option. Experiments 2 and 3 replicated this basic finding and tested several explanations. The results suggest that high identifiers' group loyalty is better explained by an extremely positive impression of their group membership (group perception) than by a justification of previous investments in the group (self-perception) or their adherence to a nonabandonment norm (norm perception). Hence, social identity seems to act as social glue. It provides stability in groups that would otherwise collapse.

If the state is at peace and is as well-governed as a human community can be, then the citizen's loyalty to his country, his services to it in the forms of energy, devotion, and funds, in general coincide with his own vital interests. The fatherland repays his loyalty by giving him safety, justice, and sometimes even freedom. In fulfilling his patriotic duties he is not performing an act of love. Only when the fatherland is in danger does his giving become a sacrifice, his serving a suffering, his loyalty a love.

—Johan Huizinga, *Men and Ideas*

The welfare and existence of many voluntary groups, small or large, depend on the willingness of group members to make regular investments in those groups. Although each member may acknowledge the importance of these investments, it can be difficult to maintain groups, because it is attractive for members to free ride on the contributions of others in the group. Indeed, if many people act selfishly, the aggregate investment levels may fall short of what is needed to preserve groups, causing them to collapse. In the social-psychological literature, such group maintenance problems are commonly referred to as *social dilemmas* or, to be more specific, as *public good dilemmas* (Dawes, 1980; Messick & Brewer, 1983; Olson, 1965; Schroeder, 1995; Van Vugt, Snyder, Tyler, & Biel, 2000).

In dealing with the free rider problem, group members can adopt at least two distinct behavioral strategies. First, they can make a collective effort to establish a surveillance and sanctioning system for detecting and punishing free riders. For example, the group may decide to impose sanctions on free riders (Fehr & Rockenbach, 2003; Yamagishi, 1986), exclude them from the group (Kerr, 1999), or appoint an autocratic leader to make decisions on behalf of the group (Van Vugt & De Cremer, 1999, 2002; Van Vugt, Jepson, Hart, & De Cremer, 2004). However, such collective solutions are costly to maintain, because they create a second order

public good (i.e., who is willing to invest in their upkeep?; Yamagishi, 1986). Furthermore, these solutions may drive out any intrinsic motivation that people have to contribute toward the good on a voluntary basis (Fehr & Rockenbach, 2003).

Alternatively, people may exit their group to either join another group (Ellemers, Spears, & Doosje, 1997; Levine, Moreland, & Ryan, 1998; Van Vugt et al., 2004) or manage on their own (Orbell, Schwartz-Shea, & Simmons, 1984; Yamagishi, 1988). Exit could either be temporary (Insko, Schopler, Hoyle, Dardis, & Graetz, 1990; Yamagishi, 1988) or permanent (Van Vugt et al., 2004), and it can be initiated either by a single group member or a subgroup of members (Arrow & McGrath, 1995).

Although individual actions may be more attractive from a personal viewpoint, from the perspective of the group it can be destructive, because by leaving, an individual withdraws vital resources from the group. This is particularly true in the case of a step-level public good dilemma, on which we focus here, because they require a minimum number of contributors (or contributions) to be maintained (Komorita & Parks, 1994). To manage a soccer team, for example, at least 11 players should be available to play at any given time. Also, businesses and voluntary organizations can only function adequately if they are able to retain sufficient numbers of staff.

Thus, in maintaining themselves, groups potentially suffer from a second kind of problem, in addition to the classic free rider problem, to which we refer as the *exit problem* (cf. Hirschman, 1970; Orbell et al., 1984; Van Vugt et al., 2004; Yamagishi, 1988). Understanding the exit problem is important for both practical and theoretical reasons. Traditionally, social dilemma research has almost exclusively focused on "closed" groups in which there are no exit opportunities available for people (for some exceptions, see Insko et al., 1990; Orbell et al., 1984; Van Vugt et al., 2004; Yamagishi, 1988). However, as shown by the examples above, many groups are, in fact, open systems that allow people to enter or leave at will, thus adding or removing potentially important group resources. Given that exit and entry decisions have profound implications for the ability of groups to solve social dilemmas, they should be an important object of study.

Furthermore, the study of groups as dynamic, open systems raises critical theoretical issues about what exactly holds groups together. Historically, questions regarding the stability of groups

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have had a prominent place in the social science disciplines (Durkheim, 1947; Katz & Kahn, 1966; Lewin, 1951). Social psychologists have often adopted a simple cost–benefit approach to group stability, analyzing members' exit and entry decisions in terms of the personal costs and rewards associated with group membership (Thibaut & Kelley, 1959).

Yet, this approach has been revised and complemented in recent years by several alternative approaches, most notably social identity and self-categorization theory (Brewer, 1979; Tajfel & Turner, 1986; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). These theories assume that once people start to identify with their group, their welfare becomes intertwined with the welfare of the group. According to this view, people who identify with their group may engage in activities to help the group even if it would involve making a personal sacrifice. As Brewer (1979) noted, "The reduced differentiation between one's own and others' outcomes associated with in-group formation [social identity] provides one mechanism for increasing the weight given to collective outcomes in individual decision making" (p. 322).

The present research aims to investigate the role of social identity processes in stay–leave decisions in social dilemma groups. Staying in order to help their group when people could receive better outcomes for themselves by leaving can be seen as an act of *group loyalty* (Levine & Moreland, 2002; Van Vugt et al., 2004). Accordingly, this research will investigate whether group identification promotes people's loyalty toward their group and, if so, why this may be. Support for this hypothesis would mean that we have found at least a partial answer to the question about what holds groups together. We therefore refer to this as the *social glue hypothesis of social identity*.

Social Dilemmas Within Open Groups

Traditionally, social dilemma research has concentrated on situations in which there is no escape from the nature of interdependence that causes the free rider problem in groups (for reviews, see Foddy, Smithson, Schneider, & Hogg, 1999; Komorita & Parks, 1994; Schroeder, 1995; Van Vugt et al., 2000). The public good dilemma assumes a closed group setting with stable group membership and payoffs for individuals that are determined by their investment decision in conjunction with the investment decisions of the other group members. This raises an issue about the ecological validity of the dilemma paradigm.

In many real-world social dilemmas, group members have the choice not only between cooperation or defection but also between staying or leaving their group, whereby they could decide to invest their resources elsewhere, for example, in a different group or in a private enterprise. Any such decision will affect the public good provision opportunities within groups. Strictly speaking, this perspective departs from the formal criteria of a classic public good dilemma in which there is no exit (or exclusion) opportunity available to group members. To us, however, the public good dilemma is primarily a convenient research paradigm that we use to analyze the dynamics of groups facing conflicts, which correspond to that of a social dilemma. Hence, the social dilemma paradigm is useful insofar as it can capture the essence and richness of naturally occurring group conflicts. Given that these situations often go beyond the simple binary choice—to contribute

or free ride—we think it is important to add relevant behavioral choices to the paradigm, such as an exit option.¹

This perspective fits rather nicely within a dynamical systems approach to groups (Arrow, McGrath, & Berdahl, 2000; Kenrick, Li, & Butner, 2003; Messick & Liebrand, 1997; Vallacher, Read, & Nowak, 2002; Van Vugt et al., 2004). Dynamical systems theory is concerned with the study of groups as complex, dynamic, and adaptive systems. The dynamical approach focuses on how groups change over time as a result of interactions between different elements within the system (individuals, tasks, and tools) as well as between the system and its embedding context. These interactions give rise to complex influence patterns that shape groups in unique ways.

Dynamical systems theory assumes that all groups act in the service of three generic functions: (a) to complete group projects, (b) to fulfill member needs, and (c) to maintain system integrity. The last function, preserving system integrity, likely depends on the group's success in achieving the first two objectives, task completion and needs fulfillment. In turn, system integrity affects the ability of groups to complete projects and meet group members' needs as well as adapt to changes in environmental demands and opportunities.

A key feature of system integrity is the preservation of a stable state across time, which is referred to as an *attractor state* or *equilibrium* (Arrow et al., 2000). Technically stated, systems are said to be stable to the extent that, when a force is impressed on it, a counterforce is produced that returns the system to its original state (cf. Lewin, 1951). Applied to groups, one potentially destabilizing force is the presence of a highly desirable exit option for group members, because it may drive them out of the group, thus withdrawing valuable resources from the group.

In social dilemma groups characterized by a low system integrity, we might expect that many members will weigh the costs and benefits of their group membership in the face of an attractive alternative and will realize that they are better off by leaving the group (Moreland & Levine, 1982; Rusbult & Farrell, 1983; Thibaut & Kelley, 1959). As a result, the group may cease to exist. In contrast, in social dilemma groups with a high system integrity, counterforces are likely to be produced within the group to fight off the threat of an attractive exit option, thus preserving the integrity of the group.

Social Identity as Social Glue

We believe that one important psychological and behavioral force contributing to group stability and integrity is a member's *group loyalty*, the desire to forgo attractive alternatives for group membership. Loyalty is a complex, multifaceted construct, consisting of emotive, cognitive, as well as behavioral elements. For example, loyalty may be manifested through the experience of strong, positive emotions (happiness, joy, empathy) associated with group membership. Cognitively, loyalty may be manifested

¹ In the same vein, researchers in the past have experimented with adding other options to the social dilemma paradigm, such as an option to enter the dilemma (Orbell & Dawes, 1993), appoint a group leader (Messick et al., 1983; Samuelson, Messick, Rutte, & Wilke, 1984; Van Vugt & De Cremer, 1999), or create a sanctioning system (McCusker & Carnevale, 1995; Yamagishi, 1986).

via depersonalized trust in other members, and optimism about the group's future. And, behaviorally, loyalty may be evidenced in the sacrifices that people make to help their group, including staying when it is personally costly (Levine & Moreland, 2002; Van Vugt et al., 2004).

Presumably, a key determinant of someone's group loyalty is the strength and nature of their identification with the group. Consistent with social identity and self-categorization theories (Tajfel & Turner, 1986; Turner et al., 1987), people's sense of who they are, their *identity*, is partly shaped by the social groups to which they belong. When people identify highly with their group, they see themselves primarily as group members. In contrast, when group identification is weak or absent, people view themselves primarily as unique individuals. These categorization processes influence the behavioral, perceptual, and affective reactions to group membership (Brewer & Brown, 1998). As many studies have found, social identity is particularly influential when people perceive a threat to the status of the group (Ellemers et al., 2002).

For example, in emergency situations, high group identifiers invest more of their personal resources in their group and show greater restraint in consuming group resources (Brewer & Kramer, 1986; De Cremer & Van Vugt, 1999; Kramer & Brewer, 1984; Van Vugt, 2001). It remains yet to be seen whether social identity also elicits feelings of group loyalty when people are confronted with an attractive exit option. So far, there is only indirect evidence to suggest that social identity may act as some kind of "social glue" in preserving group integrity when the group is under threat.

Research on intergroup relations has found that group identification increases the commitment of members to their group, but there is little evidence that staying would actually involve a personal sacrifice. Ellemers and her associates (Ellemers et al., 1997, Experiment 1; see also Doosje, Ellemers, & Spears, 1999), for example, found that group identification attenuates the desire to move from a low-status group into a high-status group. However, whether this is due to a genuine feeling of loyalty is debatable, because low-status members might equally stay out of fear of being punished by in-group members or not being accepted by outgroup members.

Similarly, research on organizational turnover has shown that employees are more likely to stay to the extent that they identify with their organization (Abrams, Ando, & Hinkle, 1998; Mael & Ashforth, 1995). Again, it is not clear whether these examples fit our definition of group loyalty, because the decision to stay may be influenced by "selfish" concerns, such as a lack of attractive job alternatives.

Two experiments have provided somewhat stronger support for the link between group identification and group loyalty. First, Barreto and Ellemers (2000; see also Barreto & Ellemers, 2002) measured members' identification with their group and then assigned them to a low-status group on the basis of bogus task feedback that they received. Subsequently, in a second task group members were given the option to work on their own or for the group in each of eight trials. They found that high identifiers chose to work for the group more often than low identifiers regardless of whether their choice was made anonymously (i.e., low identifiers only chose to work for the group if their choices were public). This task has some similarities to a social dilemma, although there appeared to be no direct material benefit involved for persons choosing to work on their own. Furthermore, individuals were

asked to make a stay-leave decision in each consecutive trial, so it is doubtful whether they truly perceived it as a decision to either stick with the group or desert it.

Finally, a study by Zdaniuk and Levine (2001) is noteworthy. They found that group identification promoted group loyalty in a task that involved some degree of personal sacrifice. Yet, in this study *group loyalty* was defined as either (a) staying in the group when doing so benefits the group rather than oneself or (b) leaving the group when doing so benefits the group rather than oneself. Group identification promoted the first form of loyalty, which is consistent with our definition of loyalty, but not the second type of loyalty, which is arguably less frequent—except perhaps in conjunctive tasks, in which group performances depend on the efforts of the weakest members (e.g., a mountaineering expedition).

Aims of the Present Research

The present research provides the first test of the social glue hypothesis in a step-level social dilemma task, where staying helps the group but harms the individual. The task requires a minimum number of members to invest to secure the group's existence (Van de Kragt, Orbell, & Dawes, 1983; Van Vugt et al., 2004). Thus, individuals who leave the group directly harm it, because they take valuable group resources elsewhere. Note that in the present studies, the exit option (a) is irrevocable, (b) involves working alone rather than joining a different group, and (c) is given to all group members simultaneously (for a similar procedure, see Orbell et al., 1984).

According to the *social glue hypothesis of social identity*, high group identifiers are expected to exhibit a greater group loyalty than low group identifiers. Thus, they should display a stronger desire to remain in their group, in particular when their current outcomes fall short of what they can get by exiting the group. Testing this hypothesis is one of the main aims of this research.

Another aim is to investigate various alternative explanations for the predicted effect of social identity on group loyalty. A first explanation is derived from the common finding that high identifiers, relative to low identifiers, invest more of their resources in groups (Brewer & Kramer, 1986; De Cremer & Van Vugt, 1999; Kramer & Brewer, 1984). Following the logic underlying cognitive dissonance theory (Festinger, 1957), an attractive exit option should create a conflict between people's past behavior—their investments in the group—and the awareness of an alternative that they are tempted to pursue. One way to resolve this conflict is to leave the group. Yet, it is presumably less costly for a group member, who has invested so much in their group, to show their group loyalty by rejecting the exit option—a form of entrapment (Brockner & Rubin, 1985). It is, of course, also possible that people merely infer their loyalty from observing their own past behavior (self-perception theory; Bem, 1972). Regardless of the exact mechanism—dissonance or self-perception—we predicted that the impact of social identity would be mediated by members' previous investments in their group. For reasons of simplicity, we refer to this as the *self-perception hypothesis*.

It is also possible that high group identifiers exhibit greater loyalty, because they are simply more satisfied with their group membership. When a social identity is activated, a depersonalization process (Turner et al., 1987) occurs that makes people perceive themselves as representatives of the group with characteris-

tics that distinguish the group from other relevant categories. Through this depersonalization process, individuals view their group and fellow members more positively (Brewer & Brown, 1998; Ellemers et al., 2002). As a result, their expectations about the group presumably increase and they should see alternatives (e.g., being alone, joining another group) as falling short of their expectations. According to the social glue hypothesis, this is even more likely to occur when, objectively, the exit option is rather attractive, and the integrity of the group is believed to be under threat.

This perceptual process could also be explained by using Thibaut and Kelley's (1959) notion of comparison level. When people identify with their group, we should observe a shift in their evaluations so that their expectations about their current group ("comparison level") increase and their expectations about alternatives ("comparison level of alternatives") decrease.

Thus, according to this argument, high identifiers' group loyalty emerges from the fact that alternatives simply look less good compared with what they believe to get from their group. If this is true, then the impact of group identification on loyalty should be mediated by extremely positive views on their group membership (e.g., "I am very happy in this group") compared with any alternative, to which we refer as the *group-perception hypothesis*. This hypothesis also predicts that high and low identifiers will react differently when confronted with their group's inability to provide favorable outcomes to them. To promote group integrity, high identifiers were expected to make more "group-serving" attributions than were low identifiers, attributing group failure less to internal causes ("other members are selfish") and more to external causes ("the task was difficult").

A third explanation for the predicted social glue effect is normative. Perhaps the decision to stay in the group is derived from a generic social norm, which conveys that once people become involved in a group, they must show their loyalty, especially when the group most needs it—in the presence of an attractive exit. According to this view, loyalty is interpreted by high-identifying members as either "sinking or swimming" with the rest of the group. This loyalty norm could be derived from moralistic reasoning about what people ought to do to help their group or from what they believe most others in the group will actually do (injunctive vs. descriptive norms; Cialdini, Kallgren, & Reno, 1991). In any case, we expected this norm to be activated by a salient social identity and to be further strengthened by social information from which it appears that other members are also staying put. Thus, this *norm-perception hypothesis* predicts that high identifiers' group loyalty is the result of the salience of a "nonabandonment" norm within their group (cf. Hertel & Kerr, 2001; Zdaniuk & Levine, 2001).

Three experiments investigated the social glue hypothesis of social identity and the underlying mechanisms. In our experiments, we contrasted and compared the self-perception, group-perception, and norm-perception hypotheses of the impact of social identity. Note that these are complementary rather than competing hypotheses. In other words, they could all be correct. In a final vein, we investigated whether behavioral manifestations of group loyalty are indeed mediated by reported feelings of group loyalty.

Experiment 1: Social Identity as Social Glue

Experiment 1 provided a first test of the social glue hypothesis of group identification. Participants were members of small, voluntary task groups, involved in a step level public good dilemma. In this dilemma type, the group requires a minimum number of contributions in order to reach the step level at which the good is provided (De Cremer & Van Vugt, 1999; Van de Kragt et al., 1983). Before the start of the task, we manipulated an individual's group identification; during the task, we provided individuals with bogus feedback, suggesting that the group had been unable to reach the step level in the majority of trials. We believed this would activate people's thoughts about their group membership. Subsequently, we offered each individual the choice to continue working in the group or alone for the remainder of the task. This was the loyalty measure.

On the basis of the social glue hypothesis, group loyalty was expected to be strongest among high group identifiers, in particular when presented with an attractive (vs. unattractive) exit option, as this would constitute a threat to group integrity. To test this hypothesis, we manipulated the attractiveness of the exit option: Working alone was either financially more rewarding or less rewarding than working in the group.

Another objective of Experiment 1 was to conduct a preliminary investigation into the nature of the predicted social glue effect. Could the predicted loyalty differences between low and high identifiers be explained by a different rate of investments in their group (self-perception hypothesis)?

Method

Design and Participants

Sixty psychology undergraduate students at the University of Southampton, 40 women (67%) and 20 men (33%), participated in this experiment for course credits. Their age ranged from 18 to 23 years, with a median age of 20. Participants were randomly assigned to one of four conditions, following a 2 (group identification: low vs. high) \times 2 (exit option: attractive vs. unattractive) between-subjects factorial design. There were 10 laboratory group sessions in total.²

Procedure

Participants arrived at the laboratory in groups of 6 to participate in a group investment task. Each participant was placed in a separate experimental cubicle with a chair, table, and computer. All the instructions were administered via the computer. After a brief instruction on the use of the computers, we explained the nature of the task to the participants. They were participating in a computer-mediated group investment task together with the other 5 participants. The task consisted of four to eight trials, but the exact number was not specified in order to avoid endplay effects—that is, if participants knew when the task ended, they would be tempted not to make an investment in the last trial (Komorita & Parks, 1994).

² In each experiment, we checked for the impact of people's laboratory group membership on the main dependent variable, the loyalty measure. This was based on the idea that, in some instances, people who knew each other well may have signed up together and therefore ended up in the same groups. However, in none of the experiments did we find a significant laboratory group effect. We therefore dismissed this factor from the main analyses.

At the start of an investment trial, each group member received an endowment of £2 (approximately \$4 US; note that throughout, £1 = approximately \$2 US), which they could either invest in the group or keep for themselves (the money was depicted on the screen in single pound coins). If the group as a whole invested £8 or more, hence if 4 out of 6 members contributed, each of the members received £4, including those who did not invest their endowment in that trial. However, if the group as a whole failed to collect £8, nobody received any money. Moreover, those who invested their endowment in that trial lost their investment.

This task fulfills the formal criteria of a step level public good dilemma in that (a) it is attractive for people to keep their endowment rather than invest it in the group, but (b) if most members (3 or more in this particular task) keep their endowment, the bonus is not provided and the outcomes for each are worse compared with when the majority (4 or more people) invest in the group (De Cremer & Van Vugt, 1999; Van de Kragt et al., 1983).

We explained to participants that this type of task resembled many group decision-making problems in real life, such as sharing a house, participating in a sports team, or running a business. These groups can only exist if enough people are willing to make group investments. Yet, from a personal viewpoint, we told them that it is attractive to invest little (or less than others) so that one could still reap the benefits from group membership without making too much effort.

Before the start of the task, participants were explicitly told that, for budgetary reasons, the money they earned during the task would not be paid out directly. Instead, it would be converted into lottery tickets, entered in a raffle with various attractive prizes (i.e., a number of £25 CD vouchers). Hence, it was desirable to gain as much money during the task to win a prize.

Manipulation of group identification. After these task instructions, the study was put into context. The study was conducted jointly by psychology departments at various local universities. These departments were all fairly similar in size and entry requirements. We therefore assumed that this would provide a meaningful categorization for the participants (for a similar procedure, see De Cremer & Van Vugt, 1999, and Van Vugt & De Cremer, 1999). Subsequently, half of the participants were told that the study purported to investigate how well different students would perform individually in these group investment tasks (low group identification condition). Conversely, the other half were told that the study's aim was to investigate how well groups of students at different universities would perform in these tasks (high group identification condition).

At this point, participants completed the manipulation checks of group identification: "To what extent do you identify with this group?" "How committed do you feel to this university?" "To what extent do you identify with this university?" "How important is this university to you?" (1 = *not at all*, 7 = *very much*). We averaged these scores into a composite index ($\alpha = .77$).

Group investment task. After each task trial, students received bogus outcome feedback, from which it appeared that the group was mostly unsuccessful in providing the bonus. In three out of four trials, there were fewer than four contributors. After the fourth trial, the task was suddenly interrupted.

In a computer message to the group, the experimenter stated that they were now halfway through the task and that "perhaps some people might want to leave the group and work on their own for the remainder of the task." The experimenter explicitly stated that all group members would get the opportunity to continue to work individually if they so wished. Furthermore, it was stated that regardless of their choice, for the remainder of the task, their group would still need at least four contributors to provide the bonus. Hence, leaving might make it more difficult for the group to provide the good in the next trials.

Manipulation of attractiveness of exit option. Half of the participants were told that if they decided to work individually, they would simply keep their endowment of £2 for each of the subsequent investment trials. This was the *unattractive exit condition*, because it was lower than what they a

priori expected to receive by staying in the group—the expected outcome was £3, the average of the four possible individual outcomes: £0, £2, £4, £6. In contrast, in the *attractive exit condition* participants were told that they would keep their endowment (£2) as well as receive the £4 bonus for each remaining trial if they decided to work individually, which was much more than their expected payoff of £3 in the group. Each participant then answered the critical group loyalty question: "For the next trials, I want to remain a member of this group" (1 = *strongly disagree*, 7 = *strongly agree*). Finally, participants completed the manipulation check of the exit option attractiveness: "How attractive is the amount of money you would get for working on your own?" (1 = *not at all attractive*, 7 = *very attractive*).

After these questions, the task was interrupted and participants received a thorough debriefing about the purpose of the study and the nature of each of the manipulations. In a postexperimental questionnaire, 4 participants (in different lab groups) expressed suspicions about the group outcome feedback that they had received ("Did you think the feedback you received about the group success or failure at each trial was genuine?" to which participants responded "yes" or "no"). These participants were removed from the sample, resulting in a final sample of 56 participants. At the end of the debriefing, the participants were thanked for their efforts, they received their course credits, and their names were entered in the prize draw, which was held after the entire study was completed.

Results and Discussion

Manipulation Checks

We subjected the average group identification score to an analysis of variance (ANOVA) using the full 2 (group identification: low vs. high) \times 2 (exit option: attractive vs. unattractive) between-subjects factorial design. As expected, participants in the high identification condition ($M = 4.57$, $SD = 1.22$) reported a higher level of group identification than participants in the low identification condition ($M = 3.64$, $SD = 1.39$), $F(1, 52) = 7.70$, $p < .01$. There was no main effect for exit option, $F(1, 52) < 1$, nor an Identification \times Exit Option interaction, $F(1, 52) < 1$. Thus, the identification manipulation was induced successfully.

To check the effectiveness of the exit manipulation, we conducted an ANOVA on the perceived exit attractiveness score (1 = *not at all attractive*, 7 = *very attractive*), including the full factorial design. There was a main effect for exit option, $F(1, 52) = 6.66$, $p < .02$, which showed that the exit option was indeed considered more attractive in the attractive exit condition ($M = 4.26$, $SD = 1.29$) than in the unattractive exit condition ($M = 3.35$, $SD = 1.42$)—only the mean in the unattractive exit condition differed significantly from the scale midpoint, $t(28) = -2.48$, $p < .02$. There were no other significant effects on the attractiveness rating scale. There was no reliable group identification main effect, $F(1, 52) = 2.17$, $p = .15$, nor was there evidence for a Group Identification \times Exit Option interaction, $F(1, 52) < 1$. This result suggests that our manipulation was successful.

Group Loyalty

According to the social glue hypothesis, high group identifiers exhibit a greater desire to remain in the group than low identifiers, particularly in the presence of an attractive exit option. To test this hypothesis we conducted a 2 (group identification: low vs. high) \times 2 (exit option: attractive vs. unattractive) ANOVA on the loyalty measure.

First, there was an overall preference within the sample for remaining in the group ($M = 5.21$, $SD = 1.61$)—the overall group mean differed from 4, the scale midpoint, $t(55) = 5.24$, $p < .001$. Second, the main analysis revealed no reliable main effects for group identification, $F(1, 52) = 1.79$, $p = .19$, nor for exit option, $F(1, 52) = 3.34$, $p = .07$. Consistent with the social glue hypothesis, the Group Identification \times Exit Option interaction was significant, $F(1, 52) = 4.98$, $p < .03$. This interaction is depicted in Figure 1. Simple main effects tests showed that, as we predicted, high group identifiers ($M = 6.21$, $SD = 0.89$) displayed a stronger desire to remain in the group than low identifiers ($M = 4.69$, $SD = 1.49$) in the presence of an attractive exit option, $F(1, 52) = 9.30$, $p < .001$. In the unattractive exit condition, there was no difference between high identifiers ($M = 4.57$, $SD = 1.28$) and low identifiers ($M = 4.93$, $SD = 2.05$), $F(1, 52) < 1$. Further simple main effect testing revealed that high identifiers expressed a stronger desire to remain in the group in the attractive than unattractive exit condition, $F(1, 52) = 16.06$, $p < .001$. However, there was no comparable difference for low identifiers, $F(1, 52) < 1$.

Investment Size Mediating Group Loyalty

To test the self-perception explanation for the influence of group identification on group loyalty, we examined whether the loyalty differences between high and low group identifiers could be explained by a differential rate of investments that they made into the group. This analysis proceeded in several steps, following Baron and Kenny's (1986) procedure for testing mediation. First, we examined whether there were differences in group investments between the low and high identifiers. Second, we investigated whether there was an association between investment size and

group loyalty. Third and finally, by controlling for investment size, we explored whether the main effect of group identification on group loyalty would disappear.

First, we added the individual contributions (0 = *never contributes*, 4 = *always contributes*) across the four investment trials and found that high group identifiers ($M = 2.82$, $SD = 1.02$) and low group identifiers ($M = 2.71$, $SD = 1.05$), $F(1, 52) < 1$, did not differ significantly in their group investments—people in both groups contributed about 70% of the time. Hence, this result failed the first test for establishing mediation. Subsequently, we performed an analysis of covariance (ANCOVA) on the loyalty measure, including the full factorial design and adding the personal investment score as covariate to the design for exploratory purposes. The covariate was not significant, $F(1, 51) < 1$ ($\beta = .08$), suggesting that there was no systematic relationship between investment size and group loyalty in Experiment 1.

In summary, Experiment 1 provided a first test of the social glue hypothesis. We manipulated group identification and showed that high identifiers displayed a greater group loyalty than low identifiers. In the presence of an attractive exit option, they expressed a greater desire to remain in their group, thereby fostering group integrity. Additional findings showed that the stabilizing effect of social identity could not be explained by self-perception reasons: Low identifiers invested as much in their group as high identifiers.

Experiment 2: The Group-Perception Hypothesis

Experiment 1 was the first demonstration of the social glue hypothesis. This finding invites replication, which was a main objective of Experiment 2.

Another objective was to test two explanations for the stabilizing influence of social identity in groups, the self-perception and group-perception hypotheses. According to the self-perception hypothesis, high identifiers' group loyalty stems from a need to justify their previous investments in the group (Bem, 1972). Thus, the impact of group identification on group loyalty is mediated by the size of members' investment in their group. Alternatively, group loyalty may result from the fact that high identifiers hold very high expectations about their group membership and, therefore, alternatives simply look less good than being in the group—the "comparison level" explanation (Thibaut & Kelley, 1959). If this is true, then high identifiers' group loyalty is mediated by a highly positive impression of their group membership compared with the alternative of being alone (group-perception hypothesis).

So far, the self-perception hypothesis has received no support. Contrary to most previous research on social identity effects in social dilemmas, Experiment 1 revealed no evidence that high identifiers invested more of their resources in the group than low identifiers. However, failure to find this effect could be due to specific features of the group investment task. For example, in Experiment 1 we used a relatively short task (i.e., four trials only), with a relatively modest endowment (£2) and a binary investment decision (contribute vs. not contribute). To provide a more optimal test of this hypothesis, in the second experiment there were more task trials, and the stakes per trial were higher because members received a higher endowment. Furthermore, participants could invest per trial any amount of their endowment in the group.

Some other features of this experiment are also noteworthy. First, we measured members' group identification directly via a

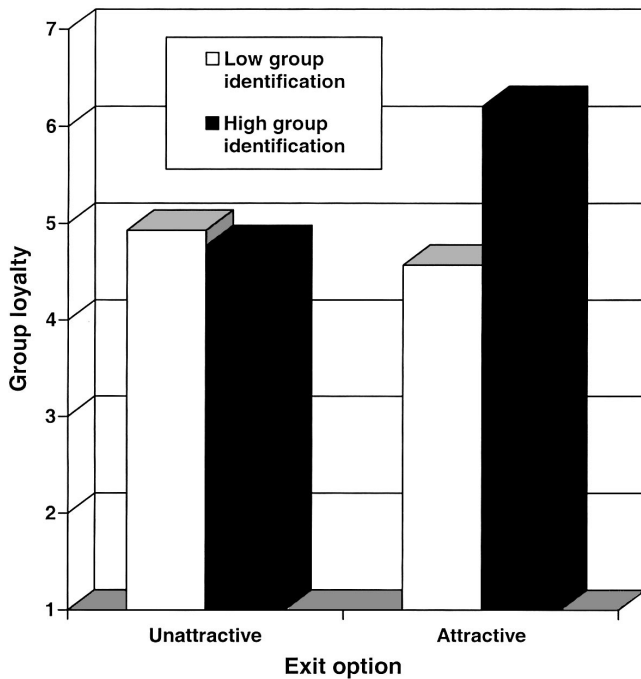


Figure 1. Group loyalty as a function of group identification and attractiveness of exit option.

pre-experimental survey and used this “natural” identification measure as the independent variable. Second, to reduce design complexity, we held the exit option constant: In terms of personal rewards, it was always more attractive for members to leave their group. Hence, the social glue hypothesis predicts a main effect for group identification. Third and finally, after indicating their group loyalty, participants were asked to give reasons for their desire to either remain in the group or leave. This enabled us to test simultaneously the self-perception and group-perception explanations for group loyalty.

Method

Participants

Ninety psychology undergraduate students from the University of Southampton participated for course credits in this experiment, 48 men (53%) and 42 women (47%), with a median age of 21. In total, there were 15 laboratory group sessions. (See Footnote 2.)

Procedure

The participants arrived in groups of 6 in the laboratory, where they were placed in separate cubicles. The experimental procedure and instructions were largely similar to Experiment 1, with a few important exceptions. First, the number of task trials before the stay–leave option amounted to six, although we did not specify the exact number of trials to participants to avoid endplay effects. In addition, the stakes of the game were slightly higher. At the start of each trial, participants received £3, and if the group as a whole invested £12 or more, each group member received £5, regardless of what they invested during that trial. Finally, they were told they could invest any part of their £3 endowment in the group (between 0 and 300 pence).

Group identification. In Experiment 2, the results of a pretask survey were used to determine the strength of people’s identification with their group. Prior to the start of the experiment, a brief meeting was held in which the 6 participants could get to know each other. Once they were seated in their separate cubicles in front of a computer screen, the experiment started. Participants were given four statements to measure the strength of their group identification: “I identify with the group I am in,” “I have a lot in common with the people in this group,” “I do not feel I belong to this group” (reverse scored), and “I see myself as someone from this group” (1 = *very strongly disagree*, 9 = *very strongly agree*). The interitem reliability of the identification measure was satisfactory ($\alpha = 0.79$); hence, we created a composite group identification scale.

Group investment task. As in Experiment 1, the outcome feedback that participants received after each trial was false and indicated that the group failed in the majority of trials (i.e., four out of six trials). After the sixth trial, the task was suddenly interrupted by a message from the experimenter on the computer screen, stating that they were now halfway through the investment task.

The experimenter then gave each of the group members the opportunity to leave the group and continue to work individually for the remaining investment trials if they so wished. If they chose to work alone, they would receive a fixed amount of £5 for each remaining trial, which was more than their expected payoff for staying in the group (£4). Hence, participants would be personally worse off continuing in the group, a feature that fits the definition of group loyalty. As in Experiment 1, before making this decision, participants were explicitly told that (a) each group member would have to make this decision and (b) for the remainder of the task, their group would still need at least four contributors to provide the bonus. Hence, leaving might make it more difficult for the group to remain viable.

Each participant then answered the critical loyalty question “For the next trials, I want to remain a member of this group” (1 = *strongly disagree*,

9 = *strongly agree*). Subsequently, we asked participants about their reasons for their stay–leave desire, two pertaining to their investment size, “I prefer to [stay or leave] because I feel I have made an investment in this group,” “. . . I have invested so much money in this group” (self-perception), and four pertaining to their evaluation of group membership (group perception): “. . . I am glad I am in this group instead of being alone,” “. . . I don’t like being in this group” (reverse coded), “. . . being in this group gives me an advantage,” “. . . I am happy and satisfied about my group membership.” This was followed by one question regarding the attractiveness of working in the group versus alone, which was presented in the form of a statement: “I get more money in the investment group than I get working on my own” (1 = *strongly disagree*, 9 = *strongly agree*).

After answering these questions, the experiment was terminated. The participants were led to a room where they received a thorough debriefing. We checked that none of the participants expressed any suspicions about the feedback they had received by asking a similar question as in Experiment 1 (“Did you think the feedback you received about the group success or failure for each trial was genuine?”)—all participants answered this question in the affirmative. After the debriefing, participants received their course credits, and their names were entered in the prize draw that was held after the study finished.

Results and Discussion

Checks and Controls

The perceived exit attractiveness ratings were analyzed first. The mean rating across the sample showed that, on average, group members considered working alone to be more attractive ($M = 3.92$, $SD = 2.39$) than working in the group, $t(90) = -4.29$, $p < .001$ (a significant deviation from 5, the scale midpoint). Thus, as anticipated, the exit option was regarded as more attractive than the option to stay in the group.

Group Loyalty

The social glue hypothesis predicts that high group identifiers are more loyal to their group than are low group identifiers. We analyzed the data using the continuous group identification scale as predictor in a regression analysis. First, there appeared to be no overall preference for either leaving or remaining in the group across the entire sample ($M = 5.07$, $SD = 2.72$), $t(89) < 1$ (no significant deviation from the scale midpoint).

But, the main effect for group identification was significant, $F(1, 88) = 10.55$, $p < .001$ ($\beta = .32$), suggesting that high group identifiers displayed a stronger group loyalty than low group identifiers. This was confirmed by the result of an ANOVA, using a median split of the group identification score ($Mdn = 5.00$, $SD = 1.49$). This analysis showed that high identifiers ($M = 6.39$, $SD = 2.04$) displayed a stronger desire to remain in the group than low identifiers ($M = 4.16$, $SD = 2.86$), $F(1, 88) = 17.45$, $p < .001$.

Investment Size as Mediator of Group Loyalty

In this analysis, we tested the self-perception hypothesis: Can the loyalty differences between high and low group identifiers be explained by a differential rate of investments in the group? This analysis proceeded in several steps (Baron & Kenny, 1986). First, we examined whether there were differences in investment size as a result of members’ group identification. Second, we investigated whether there was an association between investment size and group loyalty. Third and finally, by controlling for investment size,

we explored whether the main effect of group identification on group loyalty would disappear.

First, we found that across the six trials the average investment level was fairly high ($M = 211.44$, $SD = 45.45$; range = 0–300). More important, consistent with most previous research on social dilemmas, we found that group identification was positively related to investment size ($\beta = .19$), $F(1, 88) = 3.96$, $p = .05$. Subsequently we performed a hierarchical regression analysis on the loyalty measure, adding investment size to the equation in the first step, followed by group identification in the second step. The effect of investment size was significant, $F(1, 88) = 13.46$, $p < .001$, suggesting that the more people invested in their group, the more loyalty they showed ($\beta = .36$, $p < .001$). However, controlling for investment size, the main effect of group identification remained virtually unchanged, $F(1, 87) = 11.70$, $p < .001$ —in the original analysis, $F(1, 88) = 10.55$, $p < .001$ —revealing no support for the self-perception explanation of group loyalty. This was confirmed by conducting Sobel's Z test for mediation (Sobel's $Z < 1$).

Reasons for Group Loyalty

An alternative way to test the self-perception and group-perception hypotheses for group loyalty is by inspecting the reasons for people's preference to stay or leave. Admittedly, this is not a conclusive test because the reasons were obtained after participants had stated their stay–leave intention. Hence, any association between their reasons and intentions may therefore reflect the effect of intention on their stated reasons rather than the reverse. We should therefore interpret the results of the subsequent mediation tests with some caution.

First, we subjected the six different reasons to a principal-components analysis, which resulted in a two-factor solution. This solution explained 62% of the variance in the reasons. The four group-perception items (e.g., “I am glad I am in this group instead of being alone”) loaded highly on the first factor ($\alpha = .81$), whereas the two self-perception items (e.g., “I feel I have invested in this group”) loaded highly on the second factor ($\alpha = .73$). These scales correlated only moderately with each other ($r = .29$, $p < .01$).

We subsequently performed regressions for the group-perception and self-perception scales separately with group identification as a predictor. These analyses yielded a significant effect for group-identification on the group-perception scale, $F(1, 88) = 35.40$, $p < .001$, revealing a more positive impression about group membership from high identifiers ($\beta = .54$). Furthermore, there was a comparable effect for group identification on the self-perception scale, $F(1, 88) = 10.80$, $p < .01$, suggesting that high identifiers indeed felt they had invested more in this group ($\beta = .27$).

Thereafter, we performed a hierarchical regression analysis. We added both scales to the equation in the first step, followed by group identification in the second step. In this equation, only the group-perception score was significant, $t(87) = 7.74$, $p < .001$, indicating that a positive group impression was linked to group loyalty ($\beta = .66$); for self-perception there was no such effect ($\beta = -.08$), $t(87) < 1$. Furthermore, when we controlled for group-perception scores, the effect of identification on group loyalty

disappeared completely, $F(1, 86) < 1$; original analysis, $F(1, 88) = 10.55$, $p < .001$ (Sobel's $Z = 4.82$, $p < .001$).

Taken together, our findings provide further support for the social glue hypothesis of social identity. In Experiment 2, we also tested the self-perception and group-perception explanations for the effects of social identity on group integrity. Although high identifiers invested more in their group than low identifiers, there was no evidence to suggest that this was why they showed greater group loyalty. Our mediation analyses were more consistent with the idea that high identifiers' group loyalty was due to them holding highly positive views on their group membership.

Experiment 3: The Norm-Perception Hypothesis

As a final test of the social glue hypothesis, we attempted to replicate the findings of the previous experiments, using a manipulation of group identification. This manipulation, the salience of an in-group–out-group distinction, was much the same as the one we used in the first experiment.

A second objective of this experiment was to test a third possible explanation for the social glue hypothesis. According to a normative account, high identifiers show group loyalty because social identity activates a social norm, suggesting that members should stay in their group, despite receiving worse outcomes than they anticipated. A possible way in which this “nonabandonment” norm (Zdaniuk & Levine, 2001) would be conveyed is through the observed behaviors of other group members. Hence, to test this norm-perception hypothesis, people received (false) feedback concerning the stay–leave decision of other group members before making a decision themselves. We predicted that if normative concerns play a role, high identifiers' group loyalty would be undermined by social feedback from which it appears that other members were leaving the group, thereby violating the nonabandonment norm.

This third experiment was also designed to further investigate the self-perception hypothesis, and the (so far) more tenable group-perception hypothesis. If loyalty differences between high and low identifiers were indeed due to differential evaluations of their group membership, we should expect to see this reflected in the attributions that people would make for their group failure. Recall that groups failed to provide the good in the majority of trials preceding the stay–leave decision. Thus, we expected a stronger inclination among high than low identifiers to make “group-serving” attributions for their group performance. Hence, our prediction was that high identifiers are more inclined to attribute group failure to external causes (e.g., task difficulty) and less to internal causes (e.g., the “selfishness” of other group members).

A final objective of this experiment was to provide some preliminary support for the mediating role of feelings of loyalty on the behavioral manifestation of group loyalty. Our main argument was that the presence of attractive exit options would be perceived as a threat to the integrity of the group. In turn, the perception of a group threat should elicit a basic feeling of loyalty to the group, which would pave the way for group protective actions. According to the social glue hypothesis, feelings of loyalty should be more strongly aroused among members who strongly identify with their group.

Method

Design and Participants

Fifty psychology undergraduate students at the University of Southampton, 30 women (60%) and 20 men (40%), participated in this experiment for course credits. Their age ranged from 18 to 24 years, with a median age of 21. Participants were randomly assigned to one of four conditions, following a 2 (group identification: low vs. high) \times 2 (other's choice: stay vs. leave) between-subjects factorial design. There were nine laboratory group sessions in total (four group sessions contained five people). (See Footnote 2.)

Procedure

Participants arrived at the laboratory in groups of 6 to partake in a group investment task, which was similar to the one used in Experiment 2. The experimental instructions were also roughly the same. Each participant was placed in a separate experimental cubicle with a chair, table, and computer. In four sessions, only 5 participants showed up. Once each person was seated in their private cubicle, the experimenter pretended that the 6th person had arrived ("Ah, here you are. Can you sit down quickly because the other people are waiting for you?"). All further instructions were administered via the computer.

Similar to the previous experiment, the task consisted of six trials, yet the exact trial number was not specified. The monetary payoff structure of the task was the same as in Experiment 2, with one exception. Rather than investing any amount between 0 and 300 pence, per trial they were given a choice between keeping or investing £3 (see Experiment 1). As before, we told them that, for budgetary reasons, the money they earned during the task would be converted into lottery tickets, entered in a raffle with various prizes.

Manipulation of group identification. Similar to the first experiment, we used an intergroup comparison to manipulate group identification. The study was conducted jointly by the University of Southampton and their local rival, the Southampton Institute. This rivalry is maintained through annual sports competitions, wearing in-group badges and clothes, and through, sometimes fairly derogatory, out-group chants. Thus, half of the students were told that the study's aim was to investigate how well groups of students at these two institutions perform in these tasks (high-group-identification condition), whereas the other half were told that we were interested in the performance differences between individual students (low-group-identification condition).

Participants then completed two manipulation checks of group identification, presented as statements (1 = *don't agree at all*, 9 = *totally agree*): "I have a lot in common with the people in this group" and "I don't feel I belong in this group" (reverse coded). We averaged these scores into one identification index ($\alpha = 0.82$).

Group investment task. Bogus outcome feedback for each trial suggested that the group had failed in four out of six trials. After Trial 6, the task was interrupted and the same exit option as in Experiment 2 was presented to each group member—that is, £5 for working alone. Finally, participants were told that the group would still need at least four contributors to reach the bonus in the next set of trials.

Manipulation of other's choice. While they were making up their mind, participants received information about the stay-leave decision of one other group member. This was done as follows: The computer screen displayed the list of group members who were identified by their alphabetical letter codes (A–F) that they had received at the beginning of the experiment (the participant was always identified as "Member B"). For procedural reasons, they were asked to make their choices in alphabetical order, starting with Member A. In the other stay condition, participants received feedback that Member A had decided to stay in the group, whereas in the other leave condition, Member A had decided to work individually. It was then Member B's turn to make a decision.

Subsequently, participants answered the emotional loyalty question ("I feel loyal to this group"), followed by the behavioral loyalty question: "For the next trials, I want to remain a member of this group" (1 = *don't agree at all*, 9 = *totally agree*). This was followed by a series of statements (1 = *don't agree at all*, 9 = *totally agree*) to measure their attributions of the group failure during the trials: "Why did the group repeatedly fail in the previous trials?" There were three external attributions ("Was it because the task is difficult to understand?" "... the task instructions are not entirely clear?" "... people cannot communicate with each other?") and four internal attributions ("... people are not pulling their weights for the group?" "... people in the group are basically self-interested?" "... people are not concerned about the group welfare?" "... people do not trust each other much?"). This was followed by the manipulation check (1 = *don't agree at all*, 9 = *totally agree*) of other's choice ("Member A is loyal to the group") and a statement concerning the attractiveness of leaving the group ("Continuing on my own seems financially more attractive").

After these questions, the task was interrupted and participants received a thorough debriefing about the purpose of the study and the nature of each of the manipulations. In a postexperimental questionnaire, one participant expressed suspicions about the group outcome feedback. This person was subsequently removed from the sample, resulting in a final sample of 49 people. At the end of the debriefing, the participants were thanked for their efforts, they received their course credits, and their names were entered in the prize drawing, which was held after the entire experiment was completed.

Results and Discussion

Manipulation Checks and Controls

We subjected the average group identification score to an ANOVA using the full 2 (group identification: low vs. high) \times 2 (other's choice: stay vs. leave) between-subjects factorial design. As expected, participants in the high identification condition ($M = 5.60$, $SD = 1.81$) reported a higher level of group identification than participants in the low identification condition ($M = 4.54$, $SD = 1.47$), $F(1, 45) = 4.88$, $p < .04$. There was no reliable main effect for exit option, $F(1, 45) = 2.25$, $p = .15$, nor an Identification \times Exit Option interaction, $F(1, 45) < 1$. Thus, the identification manipulation was induced successfully.

The manipulation check for other's loyalty showed a highly significant effect for other's choice, $F(1, 45) = 41.88$, $p < .001$. The means show that Member A was indeed considered more loyal in the stay condition ($M = 6.72$, $SD = 2.37$) than in the leave condition ($M = 2.16$, $SD = 2.41$). There was no group identification effect, $F(1, 45) < 1$, nor a Group Identification \times Other's Choice interaction, $F(1, 45) < 1$, suggesting that the manipulation was successful.

Finally, the exit attractiveness rating was analyzed. The mean rating across the sample showed that, on average, people considered continuing alone financially more attractive ($M = 5.86$, $SD = 2.02$), $t(48) = 2.97$, $p < .01$ (a test against 5, the scale midpoint). It is interesting to note that low identifiers rated the exit option as more attractive ($M = 6.63$, $SD = 1.81$) than high identifiers ($M = 5.12$, $SD = 1.96$), $F(1, 45) = 7.38$, $p < .01$ —in fact, the latter mean did not differ significantly from the scale midpoint, $t(24) < 1$.

Group Loyalty

To test the social glue hypothesis of social identity, we conducted a 2 (group identification: low vs. high) \times 2 (other's choice:

stay vs. leave) ANOVA on the loyalty measure. Across the entire sample, there was a preference for neither staying nor leaving ($M = 5.24$, $SD = 2.78$), $t(48) < 1$.

As predicted, the main effect for group identification was significant, $F(1, 45) = 12.04$, $p < .001$, revealing that high identifiers ($M = 6.48$, $SD = 2.29$) were more likely to want to remain in the group than low identifiers ($M = 3.96$, $SD = 2.69$).

Contrary to the norm perception explanation for group loyalty, there was no effect for Other's Choice, $F(1, 45) < 1$. The means in the other stay ($M = 5.29$, $SD = 2.64$) and other leave condition ($M = 5.20$, $SD = 2.96$) were indeed almost identical. There was also no evidence for Group Identification \times Other's Choice interaction, $F(1, 45) < 1$.

Investment Size Mediating Group Loyalty

To test the self-perception explanation, we examined whether the loyalty differences between high and low group identifiers were due to investment size differences. Following the same procedure as in the previous experiments, we first examined whether there were investment size differences between high and low identifiers. Thus, we aggregated the individual contributions (0 = *never contributes*, 6 = *always contributes*) across the six trials, and we found that high group identifiers ($M = 3.60$, $SD = 1.96$) invested more than low group identifiers ($M = 2.42$, $SD = 1.67$), $F(1, 45) = 5.03$, $p < .03$. Second, we investigated whether there was an association between investment size and group loyalty, which there was ($\beta = .50$), $F(1, 44) = 15.62$, $p < .001$. Third and finally, controlling for investment size differences, we found that the main effect for group identification on group loyalty decreased slightly but not significantly, $F(1, 44) = 9.46$, $p < .01$ —that is, in the original analysis, $F(1, 45) = 12.04$, $p < .001$ (Sobel's $Z = 1.33$, $p = .19$). As in the previous studies, this test therefore failed to provide support for a self-perception explanation for the social glue hypothesis.

Attributions of Group Failure

On the basis of the group-perception hypothesis—high identifiers would stay in their group because they were more satisfied with their group—we expected differences between high and low identifiers in the attributions for their group's failure to repeatedly provide the good. Again, we should be cautious in interpreting these results, because the attributional data were obtained after participants indicated their stay-leave intention. Thus, the attribution scores may have been influenced by their intention rather than the reverse.

First, we subjected the seven reasons to a principal-components analysis, which resulted in a two factor solution. This solution explained 62.9% of the variance in the reasons. The three external attributions (e.g., task difficulty) loaded highly on the first factor. A reliability analysis indicated that the external attribution scale was moderately reliable ($\alpha = .64$), but could be improved by deleting one item ("People cannot communicate with each other"; without this item: $\alpha = .78$). The four internal attributions (e.g., people not pulling their weight) loaded highly on the second factor ($\alpha = .78$). There was a moderately strong negative correlation between these scales ($r = -.46$, $p < .01$).

We then subjected the internal and external attribution scales to a multivariate analysis of variance including the full factorial design. The only multivariate effect that was significant was for group identification, $F(2, 44) = 3.77$, $p < .04$; other's choice, $F(2, 44) = 1.56$, $p = .22$, and Group Identification \times Other's Choice, $F(2, 44) = 1.52$, $p = .23$.

Univariate analyses produced significant effects for group identification on both the external attribution scale, $F(1, 45) = 4.76$, $p < .04$, and the internal attribution scale, $F(1, 45) = 6.09$, $p < .02$. The means were consistent with a prediction based on the group-perception hypothesis. High identifiers were more likely to attribute group failure to external causes than low identifiers ($M_s = 3.64$ vs. 2.67 , $SD_s = 1.59$ vs. 1.60). Moreover, high identifiers were less likely to attribute group failure to internal causes ($M_s = 5.57$ vs. 6.52 , $SD_s = 1.58$ vs. 1.01).

Feelings of Loyalty

In a final vein of Experiment 3, we investigated whether the behavioral loyalty displayed by high identifiers was mediated by feelings of loyalty toward the group. As expected, high identifiers ($M = 4.88$, $SD = 2.40$) felt more loyal to their group in comparison to low identifiers ($M = 3.38$, $SD = 2.51$), $F(1, 45) = 4.49$, $p < .05$. Subsequently, we added the emotional loyalty score as a covariate to an ANCOVA, including the full experimental design. Behavioral loyalty was influenced by emotional loyalty, $F(1, 44) = 36.90$, $p < .001$ ($\beta = .69$). Furthermore, the inclusion of emotional loyalty significantly reduced the impact of group identification on behavioral loyalty, $F(1, 44) = 6.91$, $p < .02$; in the original analysis, $F(1, 45) = 12.04$, $p < .001$ (the explained variance was reduced by almost 50%; Sobel's $Z = 2.03$, $p < .05$).

Taken together, the results of Experiment 3 provided further support for the social glue hypothesis of social identity. They also shed further light on the different explanations for the social glue effect. The normative explanation received no support, at least so far. Furthermore, there was again no evidence for the self-perception interpretation. However, through the attributional analysis, we found further support for the group-perception interpretation. Finally, a mediation analysis suggested that the group loyalty displayed by high identifiers could, at least in part, be explained by their feelings of loyalty toward the group.

General Discussion

This research provided evidence in support of the positive influence of social identity on maintaining group integrity. When confronted with an attractive exit option, high (vs. low) group identifiers exhibited a greater desire to remain in their group, thus showing their group loyalty. The findings from three laboratory experiments, in which we used rather minimal group categories such as university affiliations, suggest that social identity acts as social glue by holding groups together that would normally collapse due to a shortage of resources.

Recall that in the experiments, each group needed a minimum number of contributors to be viable—a step-level public good. By exiting their group, people withdrew valuable resources from the group. Social identity thus contributes to the integrity and stability of groups. It ensures that if there is an external threat imposed on the group, a counterforce is produced to reduce the impact of the

threat. In our studies, this was evidenced by an enhanced group loyalty when group members were confronted with an attractive exit option.

Our findings fit in with the broader idea of groups as dynamic systems (Arrow et al., 2000; Kenrick et al., 2003; Messick & Liebrand, 1997; Vallacher et al., 2002). Dynamic systems theory assumes that groups are open systems that are in continual interaction with their environment. In order to maintain system integrity, groups have stability mechanisms in place that enable the system to adapt to internal and external group pressures. Groups may differ, however, in the responsiveness to these pressures, depending on the strength and depth of these stability mechanisms.

Group stability is influenced by the complex interaction between local group dynamics and contextual dynamics. For example, in groups with generally weak ties between members (low group identification), the sudden appearance of a desirable exit option may quickly move the group from one state (full group membership) to another state (group dissolution), which is a sign of instability. In contrast, groups with strong ties may be attracted to a single state that is very stable (full group membership) and it may take considerable force to take the group out of this equilibrium. One such force may be the introduction of a sanctioning system (Yamagishi, 1986). With the introduction of penalties for noncooperation, group members may become narrowly focused on their personal outcomes—to avoid being punished—rather than the outcomes for the group (McCusker & Carnevale, 1995). This may weaken the social ties within the group (Fehr & Rockenbach, 2003). Under these conditions, even high identifiers may consider leaving the group to pursue an attractive alternative.

Our results suggest that social identity is one of the cornerstones of a high group integrity, which is the key to group survival (Arrow et al., 2000). In addition, numerous other factors may affect group stability and integrity. Our previous research shows, for example, that autocratic leadership creates instability in groups as many members leave their group once they perceive a viable exit opportunity. In contrast, democratically led groups are more stable because their members stay put in the presence of an attractive exit option (Van Vugt et al., 2004).

Antecedents of Group Loyalty

Why does social identity promote group loyalty and integrity? We believe that the effect can be understood in terms of both proximate and ultimate levels of explanation. In the experiments, we tested three, nonrival, proximal explanations for the emergence of group loyalty among high identifiers. We labeled them as the *self-perception*, *group-perception*, and *norm-perception hypotheses*. The self-perception hypothesis, which is inspired by cognitive dissonance theory (Festinger, 1957) and self-perception theory (Bem, 1972), suggested that high identifiers' group loyalty can be explained by a justification of previous investments in the group. But this hypothesis, which is reminiscent of the "entrapment" phenomenon (Brockner & Rubin, 1985), received little support. The secondary analyses of the three laboratory studies were not consistent with the idea that investment size mediated the social-identity-as-social-glue effect. Instead, in two experiments, we found a direct effect of investment size on group loyalty (cf. Rusbult & Farrell, 1983). Social identity and self-justification

(self-perception) can thus be seen as two largely independent routes toward achieving a high group integrity.

Also, our findings seem to rule out a normative explanation for the social glue effect (although this hypothesis was tested in just one experiment). Participants' group loyalty was not influenced by their observation that other group members were leaving the group, thus violating the nonabandonment norm ("sinking or swimming"). This norm, however, presumably contains not just descriptive elements (i.e., what others do) but also prescriptive elements (i.e., what people ought to do; cf. Cialdini et al., 1991). So, it could be that information regarding the exit decision by one member actually increased the salience of this norm and that people wanted to communicate to others in the group that they distanced themselves from this individual by staying put.

We have no way of testing these alternative explanations with the current data, but the lack of an interaction between social identity and other member's choice suggests that social norm salience does not explain the loyalty differences between high and low identifiers in this study. Nevertheless, it would be fruitful in future research to further investigate this normative explanation, for example, by subjecting participants to loyalty norm primes (Hertel & Kerr, 2001). Also, it would be interesting to collect participants' impressions of stayers and leavers in their group. High identifiers may perceive leavers as immoral people, whereas low identifiers may perceive them as intelligent.

The group-perception hypothesis received more support. The mediation analysis in the second experiment was consistent with the idea that high identifiers had an extremely positive impression of their group membership (compared with working alone) and that this impression influenced their group loyalty. Admittedly, we should be cautious with this interpretation because these evaluation data were obtained *ex post facto*. Nevertheless, these findings suggest that the effects of social identity are probably more evaluative in that a social identity simultaneously creates a high comparison level and a low comparison level of alternatives (Thibaut & Kelley, 1959), such that leaving always looks less appealing than staying in the group. Sometimes, these perceptions may even be distorting reality to some extent. For example, in the last study we found that high identifiers and low identifiers differed in their perception of the financial attractiveness of the exit option. High identifiers thought that staying in the group was as financially sound as leaving, which was clearly not true, based on the group's previous performance.

The group-perception hypothesis was further supported by the results of the attributional analyses. High identifiers were less likely to attribute group failure to internal and stable causes (such as the greediness of other people) and were more likely to attribute failure to external and unstable causes (such as the task difficulty). These attributions presumably enabled them to maintain a positive impression of their group as well as optimism about future group performance. It would be interesting in future studies to explore the boundaries of this group-serving attributional process: For example, what happens if groups consistently fail?

An alternative interpretation for the social glue effect should also be considered. It may be that group identification triggers an altruistic motivation, whereby people stay in their group, despite having an easy way out, because they empathize with other group members (empathy-altruism hypothesis; Batson, 1998). An increased empathy among high group identifiers could be based on

a merger between their individual self and their collective self (cf. Cialdini, Brown, Lewis, Luce, & Neuberg, 1997).³ Further experimental research is clearly needed to test this and other possible explanations for group loyalty. For example, following an altruistic explanation, resource differences between group members should lead to different levels of group loyalty because the departure of a “rich” member will have a more dramatic impact on the group’s welfare than the exit of a “poor” member. Yet, according to a normative or group-perception account, the criticality of members should have no effect whatsoever on their stay–leave decisions.

Moving away from these proximate levels of explanation, how can we explain the emergence of group loyalty at a more distal level? Theorizing on the evolutionary origins of human social behavior suggests that small social groups were a primary medium for the natural selection of human beings (Caporael & Brewer, 1991). Social groups enabled our ancestors to nurture their children and to gather and share resources as well as information, necessary to survive in a hostile environment. At the same time, however, group living introduced social dilemmas that produced rifts between group members and destabilized groups. These conflicts needed to be managed in order for individuals to reap the advantages of group life for their survival and reproduction.

Given the diversity of factors that may cause groups to disintegrate, it seems reasonable to suggest that various psychological mechanisms might have emerged during our evolutionary history to promote group integrity. Because attractive exit options form a realistic threat to the group’s existence, and thereby indirectly to the individual welfare, it is conceivable that mechanisms may have evolved in individuals to encourage them to forgo immediate outcomes available outside the group (Nesse, 2001). One such mechanism may produce a perceptual, affective, and behavioral effect whereby individuals, when they see themselves as group members, develop exaggerated positive views of the group, develop feelings of loyalty, and display sacrificial behaviors on behalf of their group.

Admittedly, this argument is speculative. On the basis of these findings, we cannot be certain that group loyalty reflects a deeper psychological process that has evolved to keep the group together during adverse periods. Although we have excluded the possibility that group loyalty is simply due to a rationalization process (i.e., justifying previous investments in the group), it could still serve an entirely different function. Nevertheless when one considers the importance that stable, cohesive groups have in enhancing an individual’s well-being—both in our ancestral past (Nesse, 2001) and in the present (Moreland, 1999)—it seems reasonable to suggest that evolutionary forces could explain the obtained effects at least to some degree.

Limitations and Directions for Future Research

In our experiments participants were constrained to choose between staying in the group or working on their own, thus eliminating the interdependence with other people. What would happen to group loyalty if people could also join a rival group—a common alternative in natural group settings (Levine et al., 1998)? Theoretical predictions vary about the introduction of this opportunity. Social exchange theory (Thibaut & Kelley, 1959) proposes that as long as the expected outcomes of these exit options are the

same, people would be indifferent. Social identity theory (Tajfel & Turner, 1986) predicts an even stronger manifestation of group loyalty in the presence of an appealing rival group, because people are motivated to secure a positive in-group–out-group differentiation. Yet, on the basis of evolutionary theories of group belongingness (Baumeister & Leary, 1995), it is possible to predict exactly the opposite—a weaker group loyalty in the presence of another group versus being alone—given the fundamental desire of humans to belong to groups. Investigating the effect of introducing different exit options on group loyalty would be an interesting extension of our research.

This research focused on group loyalty as just one example of a group maintenance strategy. Presumably, there are many other maintenance mechanisms simultaneously at work in groups. For example, there is abundant evidence that a shared identity encourages people to stick together during a collective crisis (Brewer & Kramer, 1986; De Cremer & Van Vugt, 1999; Kramer & Brewer, 1984; Van Vugt, 2001). A different maintenance strategy relates to the admission of newcomers in groups, another potentially destabilizing force (Moreland & Levine, 1982). Recent research suggests that high identifiers are more selective than low group identifiers in their judgment whether somebody is an in-group or out-group member (“overexclusion effect”; Castano, Yzerbyt, Bourguignon, & Seron, 2002). On the basis of our findings, we speculate that high identifiers will be particularly suspicious of outsiders if group norms and resources are perceived to be under threat.

Finally, in this research we have focused on one type of group stability, which culminates from member’s resistance to an outside threat. Yet, a dynamic systems approach (Arrow et al., 2000; Vallacher et al., 2002) delineates that system stability can also be defined more dynamically, in terms of the resilience of the system in bouncing back from a setback, for example, the loss of members or task failure. Groups presumably vary a great deal in the speed and strength of their recovery from such setbacks. Social identity may impact on both types of stability by fostering not only the resistance against an external threat (like an attractive exit option) but also the group’s resilience in coping with the effects of these threats (like the loss of members). In much the same way as a thermostat regulates the room temperature by adapting it to the temperature outside, social identity may act as a self-regulation device within groups, adjusting the in-group climate to external group conditions.

Conclusions and Implications

Social identity plays a key role in promoting group integrity by increasing members’ loyalty to their group. In light of the fact that most (if not all) groups outside the laboratory are open systems, it is important to consider what factors foster group integrity and stability. One fairly drastic solution is to close group boundaries so that it becomes impossible for people to voluntarily leave groups (e.g., the Berlin Wall), but such measures are costly, inefficient, and unacceptable in most societies. One could also wait until group members have made sufficient investments into their group so that they feel obliged to stay, but this may take some time. A quicker

³ We thank one of the reviewers for making these suggestions.

and more acceptable solution is to find ways to enhance members' group identification so that they stay voluntarily and help their group when it is believed to be under threat.

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