Cohesion in online groups

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Abstract

Groups are traditionally defined in terms of the interpersonal bonds that exist between group members and thus cohesion is based on the strength of those bonds. The transition of this definition of the group onto online groups leads to attempts to emulate face to face behaviour through presentation of group member pictures, video and detailed personal descriptions. However, this can be problematic due to reduced bandwidth and individual cues necessary for supporting interpersonal behaviour. A social identity approach to groups, in contrast, defines the group in terms of group members' cognitive representation of the group identity, rather than interpersonal bonds. From this perspective cohesion is defined in terms of the strength and salience of the group identity and is not dependent on the transference of interpersonal cues, or constrained by group size. Indeed, interpersonal information can act to the detriment of group cohesion. This counter-intuitive approach to cohesion in online groups has a number of implications in terms of group development and group behaviour in online groups. Two longitudinal field studies of computer-mediated collaborative learning groups investigated these issues. Cohesion in the groups was achieved through the application of this approach to both the design of the group tasks and communication environment, and results showed amongst other things, that cohesion was determined by identification with the group, and that this identification was associated with increased accountability, decreased conflict and, furthermore, positively influenced group productivity (measured by the group mark) through group member prototypicality. This paper discusses the theoretical approach outlined here, the specifics of the two longitudinal studies and the wider implications of this approach to online groups.

Keywords: social identity, cohesion, online groups, cmc, prototypicality, group performance.
1 Introduction

Computer-mediated, or online technologies enable group communication that spans traditional geographical and temporal boundaries. Individuals are brought together in work teams, project groups or collaborative learning groups to work collectively via technologies such as asynchronous electronic bulletin boards and synchronous chat facilities. However, despite the many and often discussed advantages that computer-mediated technologies can bring to group communication, the nature of the medium can also lead to difficulties for the effective working of the group. The absence from the relatively anonymous text-based communications of non-verbal cues and other such interpersonal information results in an environment that is markedly different from traditional face-to-face group communication, and can have significant implications for group dynamics. For example, it has been suggested that social influence and thus cohesion in online groups suffers because of the lack of available interpersonal cues [1].

Cohesiveness, which describes a property of the group as a whole, is traditionally conceptualised in terms of interpersonal attraction or bonds between group members, and involves an aggregation of these bonds [2, 3]. Moreover, cohesiveness defined in these terms is reported to be positively associated with, and a key element of, group performance and effectiveness [4, 5]. From this perspective, therefore, in order to ensure effective online groups, these groups should be cohesive and to achieve this interpersonal bonds between group members should be supported. Indeed, Greenberg [6] suggests that text based communication is inadequate and that individuals in a group workspace should have at least a voice channel. He goes on to say that, "Electronic virtual workspaces must emulate the affordances of physical workspaces if they are to support a group’s natural way of working together" (p. 246). Attempts to emulate face-to-face behaviour, or at least increase interpersonal behaviour, in the computer medium include provision of photographs, video and other individuating information. It is assumed that to support group processes, the focus should be on the interpersonal level, i.e. supporting interpersonal communication between individuals within the group, and the relative anonymity offered by computer-mediated communication should be reduced to a minimum.

An alternative perspective to group cohesion, however, is provided by a social identity approach to groups [7, 8]. This approach suggests that there are two broad classes of identity which can define the self: personal identity, which comprises idiosyncratic personal relationships and traits; and social identity, which defines the self in terms of particular group memberships. Similarly, a distinction is made between personal attraction, or liking based upon interpersonal bonds, and social attraction, which is defined as inter-individual liking based upon perceptions of self and others not in terms of individuality, but of identity related group prototypes. If self-definition is determined by a group identity, group cohesion will not be determined by interpersonal bonds, but by concepts such as the level of group identification and perceptions of group prototypicality. In other words, from a social identity perspective, a group is
defined in terms of the group identity that exists as individuals’ cognitive representations and it is this group identity that provides the ‘social glue’ or sense of belongingness that holds the group together. Furthermore, associated with the group identity are norms which govern group behaviour, and adherence to these norms is, to a large extent, determined by the level of group identification, i.e. the degree to which one identifies with the group. For example, motivation to work for the group should be intrinsically linked to group identification [10].

The social identity approach to groups has a significant advantage over traditional perspectives when considering computer-mediated groups. The information required to convey a social identity is minimal and can be as little as a group name, and so can easily be transmitted to a number of group members through text-based technologies. Even this small amount of information can carry with it norms and behaviours associated with that identity and can foster feelings of group belongingness. This is in stark contrast to that necessary for the transmission of interpersonal cues or information. Furthermore, at any one time either a personal or particular social identity can be prominent or salient [9] and so interpersonal information can in fact detract from the development of a strong social identity. A number of laboratory studies have demonstrated that a reduction of interpersonal cues through anonymity in computer-mediated communication can be harnessed to raise social identity salience of the communication group and overcome the often-cited drawback of computer-mediated interaction at a distance [11, 12, 13].

1.1 Research domain

This paper investigates the social identity approach to online groups in two field studies of collaborative learning students. Students were based at either the University of Manchester or the University of Amsterdam, and in each cohort ten groups consisting of 2 or 3 students from each University participated. Groups collaborated for five weeks to produce a single group report on a given topic. All communication was via a web-based conferencing software, WebBoard, which enabled synchronous chat as well as email and discussion board functionality. Groups were required to communicate during a one and half hour class each week, but were also expected to continue communications outside of this allocated class time. Indeed, in order to complete the assignment, groups found it necessary to communicate extensively over the five week period. Although groups were given some specific tasks to complete each week, they were free to organise themselves as they saw fit. At the end of each week participants completed self-report questionnaires, which measured items such as cohesion, identification, prototypicality, interpersonal liking and accountability on 9-point scales. There was some variation, however, in the content of questionnaires from week to week and between cohorts. The objective performance measure was taken to be the group grade received for the group assignment.
1.2 Research interventions

A number of interventions to the design of the task, instructions and web environment in which students collaborated ensured that the identity of the collaborating group was salient throughout the collaborative period. This included an emphasis on the group rather than individual responsibilities, a completely anonymous initial group meeting (to facilitate sole focus on the group) and an intergroup comparison phase to aid ingroup-definition. In addition the web environments through which groups collaborated were collectivised (as distinct from personalised) throughout the collaborative period. This was achieved with the use of distinct group colours, icons and reflective descriptions focusing on the group, rather than on individual group members. All these interventions were designed to enhance the salience of the collaborating group over and above alternative identities, e.g. nationality, university affiliation as well as personal identity. It was predicted that this would ensure that group members identified with the collaborating group, and consequently saw group members in terms of prototypical, or representative group characteristics, rather than focusing on interpersonal factors.

2 Results

Identification with the collaborating group was measured in both cohorts at weeks 1, 2, 4 and 5. Cohesion was also measured during these times, but only in cohort one. Figure one demonstrates that identification with the group and cohesion increased over time.

![Figure 1: Group identification and cohesion over time.](image)

To confirm that cohesion was based upon group level, rather than interpersonal level perceptions, multiple regression predicted cohesion by group
identification, prototypicality and interpersonal liking. Table 1 displays the results of these regressions at time 2 and time 4 for cohort 1 (prototypicality and interpersonal liking were only measured at these times). Group effects were also investigated, but none were significant. At both times, cohesion was significantly predicted by group identification, rather than other measures, although this was more pronounced during week 2. Group members identified with the collaborating group and thus perceived the group to be cohesive. Interpersonal bonds were therefore not necessary for the group to become cohesive.

Table 1: Regressions predicting cohesion at weeks 2 and 4, *p<0.01.

<table>
<thead>
<tr>
<th>IV</th>
<th>Week 2</th>
<th>Week 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>β</td>
</tr>
<tr>
<td>Group Identification</td>
<td>0.98*</td>
<td>0.93</td>
</tr>
<tr>
<td>Prototypicality</td>
<td>-0.05</td>
<td>-0.03</td>
</tr>
<tr>
<td>Interpersonal liking</td>
<td>0.11</td>
<td>0.09</td>
</tr>
</tbody>
</table>

The next question is what effect, if any, does this formulation of cohesion have on group performance, as measured by the final group product? Initial correlation analyses revealed no significant effects of cohesion on the final group product. However, group identification based prototypicality had some positive association with group performance.

This issue was further investigated with path analysis using LISREL 8.54 [14]. The social identity approach posits that identification with a salient social identity, involves a shift away from individual personal identities and towards the perception of the self and others to representatives of the social category. This process assimilates the self and others in terms of the ingroup prototype and encompasses the norms and goals of the group. It was therefore predicted that identification with the group increased prototypicality in the group, which subsequently led to improvements in group performance. Table 2 presents the input correlation matrix for the path analysis.

Table 2: Correlations and descriptives for the LISREL input variables, *p<0.01.

<table>
<thead>
<tr>
<th></th>
<th>Group id wk2</th>
<th>Group id wk4</th>
<th>Proto wk2</th>
<th>Proto wk4</th>
<th>Group Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group id wk2</td>
<td>1.00</td>
<td>0.57*</td>
<td>0.55*</td>
<td>0.45*</td>
<td>0.07</td>
</tr>
<tr>
<td>Group id wk4</td>
<td></td>
<td>1.00</td>
<td>0.34*</td>
<td>0.59*</td>
<td>0.20</td>
</tr>
<tr>
<td>Proto wk2</td>
<td></td>
<td></td>
<td>1.00</td>
<td>0.62*</td>
<td>0.37*</td>
</tr>
<tr>
<td>Proto wk4</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>0.30</td>
</tr>
<tr>
<td>Group mark</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Mean</td>
<td>6.69</td>
<td>7.28</td>
<td>6.61</td>
<td>6.85</td>
<td>69.09</td>
</tr>
<tr>
<td>SD</td>
<td>1.69</td>
<td>1.21</td>
<td>1.26</td>
<td>1.12</td>
<td>6.18</td>
</tr>
</tbody>
</table>
The proposed model is shown in Figure 2. Analysis of the model fit criteria indicated that the model fit the data $\chi^2(4) = 4.14$, $p = 0.39$, RMSEA = 0.03; AGFI = 0.86; standardised RMR = 0.05] (for a discussion of these fit criteria see Brown and Cudeck [15]). The paths from group identification to prototypicality are significant, as are the longitudinal paths. However, the path from prototypicality at week 4 to group performance is non-significant, as is the path from prototypicality at week 2 to group performance, although this later path is near to an acceptable level. If the model is re-specified, omitting the path from prototypicality at week 4 to group performance, however, then the model remains a good fit $\chi^2(5) = 4.26$, $p = 0.52$, RMSEA = 0.00; AGFI = 0.89; standardised RMR = 0.05] and the path from prototypicality at week 2 to group performance is stronger and significant ($\beta = 0.28$, $p<0.01$). It seems, therefore, that prototypicality had a greater effect on group performance during the early, rather than later stages of the group development.

![Diagram of Model](image)

Figure 2: Model of group identification, prototypicality and performance.

This above model was contrasted with alternative models which suggest that social identity based cohesion improved group performance, or that increased interpersonal liking within the group improved performance. If the prototypicality measures in Figure 2 were replaced by cohesion, then the model was a reasonable fit $\chi^2(4) = 5.00$, $p = 0.29$, RMSEA = 0.08; AGFI = 0.85; standardised RMR = 0.06], but the paths from cohesion at week 2 and 4 were both non-significant and near zero (week 2: $\beta = -0.03$, ns; week 4: $\beta = -0.01$, ns). Removing one or other of these paths had no effect on the effect of cohesion on group performance. Similarly, the model was also adjusted to replace the prototypicality measures with interpersonal liking measures. In this instance the model did not fit the data $\chi^2(4) = 6.07$, $p = 0.19$, RMSEA = 0.11;
AGFI = 0.80; standardised RMR = 0.07], although all but the paths from interpersonal liking to group performance were significant. The path analysis therefore demonstrated that it was prototypicality that influenced group performance rather than cohesion. Both cohesion and prototypicality were grounded in group identification and are therefore related constructs (correlation between cohesion and prototypicality week 2, \( r=0.53, p<0.01 \); week 4, \( r=0.70, p<0.01 \)). However, where cohesion is a perception of group unity as a whole, prototypicality takes into account the relative impact of each group member as representative of the group, and reflects a perception of a group of ‘team players’. This will be expanded upon in the discussion below.

Thus far, the results have focused on the constructs investigated during cohort one and have demonstrated the crucial nature of group identification in both group definition and behaviour. This theme was continued during cohort two and although there is not space to go into details here, some brief observations are possible. For example, group identification was associated with increased posts to the discussion board (week 2: \( r=0.35, p<0.05 \); week 4: \( r=0.34, p<0.05 \); week 5: \( r=0.33, p<0.05 \)), and efficacy (week 1: \( r=0.59, p<0.01 \); week 2: \( r=0.65, p<0.01 \); week 4: \( r=0.64, p<0.01 \); week 5: \( r=0.75, p<0.01 \)). It was also correlated with conflict resolution measures (week 2: \( r=0.42, p<0.01 \)); reduced task and personal conflict (week 4: \( r=-0.36, p<0.05 \); \( r=-0.44, p<0.01 \), respectively); and with increased feelings of accountability (week 1: \( r=0.54, p<0.01 \); week 2: \( r=0.77, p<0.01 \); week 4: \( r=0.80, p<0.01 \); week 5: \( r=0.54, p<0.01 \)). Furthermore, in both cohorts, group identification and prototypicality were shown to be instrumental in intragroup leadership emergence and support [16].

3 Discussion

This paper has presented an approach to computer-mediated groups that is theory led and thus amounts to more than mere provision of group communication tools. Furthermore, the approach is counter-intuitive, claiming that rather than attempting to emulate face to face interaction in the computer medium, interactions that are appropriate to the medium should be encouraged. It is then possible to use the anonymous nature of computer-mediated communication to the advantage of collaborating groups rather than trying to overcome it. This is achieved through a re-conceptualisation of the group from one based upon interpersonal bonds, to one based upon a shared social, or group, identity. From this perspective, group cohesion is based upon the group identity, but it is this identity and perception of the group members’ in terms of this identity, rather than cohesion per se, that determines subsequent group behaviour. In addition to the results described above, anecdotal evidence from the field study cohorts provides further demonstrations of the strength and nature of a salient group identity. For example, in cohort two, one (all female) group was allocated the group name ‘Pink’ and consequently their collaborative web environment was coloured pink. Throughout the collaborative period, this group referred to themselves as the ‘Pink ladies’ and arranged to all be dressed in pink for the final video-conferencing session, in which they presented their work to the rest of
the groups. This further demonstrates that the shared identity, based as it was initially on a colour, had significant behavioural implications for the group.

Group identification, although instrumental in much group behaviour, did not have a direct impact on group performance. Simply because an individual identifies with a particular group, does not guarantee group success. However, perceived prototypicality in the group did positively affect group performance, although only at the earlier stages of group development. This demonstrates that it is important, not only for each individual group member to be working for the group, but that they perceive that other members of the group are acting in the same way, i.e. demonstrate the characteristics of ‘team players’. It is suggested that this is particularly important in small distributed groups working in a computer medium where it is not always clear what the other group members are doing. Identification with the salient group and prototypicality are closely related constructs, i.e. as a shared social identity and therefore individual identification with the group is primed at the beginning of the collaborative period, prototypicality emerges as a consequence of this identification. In addition, prototypicality can also affect subsequent levels of identification with the group. These two constructs of identification and prototypicality differ, however, in a number of ways. Firstly, prototypicality is more context dependent than group identification and is subsequently more likely to be sensitive to comparative context (e.g. intergroup comparisons); and secondly, prototypicality is concerned with the position of the individual group member relative to other group members, whereas group identification reflects the extent to which the group as a category is integrated into the self [17]. Within the framework of a shared social identity, prototypicality therefore encompasses the norms and perceptions of the whole group and can have a significant effect on the output performance of the group.

The central premise of this paper is that the group should be defined in terms of a shared group identity rather than interpersonal bonds between individual group members. Furthermore, the emphasis at all times should be on the shared social identity rather than alternative category memberships or personal identities. However, it should be made clear that it is not the position that groups should consist of homogenous group members who show no intragroup differentiation. Instead, it is argued that when the focus is on the shared group identity, intragroup differentiation takes place that is based upon group prototypicality. Therefore, individual group members can take on different roles and demonstrate individual talents, but it must be perceived that these are for the benefit of the group rather than the individual. In addition, friendships and interpersonal bonds between group members will develop over time and are not discouraged. These are natural developments. However, it should not be the role of the design process to increase the salience of personal identities as this would detract from the goal of the group. This is particularly important during the early stages of the group development when a group identity has not been established. This is in contrast to traditional ‘ice-breaking’ tasks where the personal identity is made salient during the initial group meeting and then personalising tasks continue the attempt to foster interpersonal bonds.
The results of this research presented above have been specifically addressed to collaborative learning groups using computer-mediated communication. However, many of the implications are relevant, not only to learning groups, but to any group communicating via CMC technologies, e.g. distributed research groups or project groups. If the nature of the group is re-conceptualised from one based upon interpersonal bonds to one based upon a shared social identity, the salient group identity can ensure a cohesive group whose members are motivated to work for the group due to their shared identity. This is in contrast to groups that consist of individuals whose salient identity may be, for example, personal, departmental, organisational or national, and can have significant impact on group behaviour and performance. In focusing on the group’s commonalities, rather than differences, it is hoped that the group can become more successful and efficient.

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References


