Emotions are not always contagious: Longitudinal spreading of self-pride and group pride in homogeneous and status-differentiated groups

Ellen Delvaux\textsuperscript{a}, Loes Meeussen\textsuperscript{a} & Batja Mesquita\textsuperscript{a}

\textsuperscript{a} Center for Social and Cultural Psychology, Faculty of Psychology and Educational Sciences, University of Leuven, Leuven, Belgium

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Emotions are not always contagious: Longitudinal spreading of self-pride and group pride in homogeneous and status-differentiated groups

Ellen Delvaux, Loes Meeussen, and Batja Mesquita

Center for Social and Cultural Psychology, Faculty of Psychology and Educational Sciences, University of Leuven, Leuven, Belgium

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The members of task groups are emotionally more similar to each other than to others outside the group; yet, little is known about the conditions under which this emotional similarity emerges. In two longitudinal studies, we tested the idea that emotions only spread when they contain information that is relevant to all group members. We compared the spreading of group pride (relevant) with self-pride (not relevant). The first study followed emotions in 68 task groups ($N = 295$) across 4 moments. Multilevel cross-lagged path analyses showed that group members mutually influenced each other’s group pride, but not self-pride. The second study followed emotions in 27 task groups ($N = 195$) across 3 moments in time. Longitudinal social network analyses showed that group members adjusted their group pride, but not their self-pride, to members they perceived to be more influential. Findings from both studies are consistent with a social referencing account of emotion spreading.

Keywords: Group emotions; Contagion; Social referencing; Pride; Status networks.

Emotions have a tendency to spread to others close to us (Parkinson, 2011), leading to emotional similarity. For task groups, this emotional similarity has been particularly well documented: Members of task groups are emotionally more similar to one another than to others outside of the group (e.g., Barsade, 2002; Bartel & Saavedra, 2000; George, 1990; Ilies, Wagner, & Morgeson, 2007; Totterdell, 2000; Totterdell, Kellett, Teuchmann, & Briner, 1998). Whereas emotional similarity as an outcome has received much research attention, not much is known about the conditions under which emotions spread. The current study focuses on the spreading of emotions within task groups.

There are currently two different accounts of emotion spreading. According to a “contagion” account, emotions spread automatically when group members come into contact (e.g., Hatfield, Cacioppo, & Rapson, 1994). This account that uses a disease metaphor, resonates with insights from old crowd psychology, as represented by the social psychologist Gustav LeBon (1896). In LeBon’s words: “In a crowd every sentiment and
The idea of emotional contagion has recently been challenged. An alternative account of spreading claims that emotions do not spread to others unless they are applicable to them and communicate relevant information on the meaning of an event or situation that is of joint relevance (e.g., Hess & Fischer, 2013; Parkinson, 2011; Van Klief, 2009); this account has been coined as “social referencing”. By the contagion account, emotions would spread irrespective of their object; by the social referencing account, emotional transfer would be limited to conditions where the emotion provides relevant information to others.

The current research was designed to compare these accounts of emotional spreading in the context of groups. We expected that emotions that contain information about the group would spread more readily than emotions that merely focus on the individual, since the former and the latter are not equally relevant to all group members. In two longitudinal studies of the emotions in task groups, we investigated whether group-focused emotions travelled faster than emotions focused on the individual.

THEORETICAL APPROACHES TO EMOTION SPREADING

There is increasing evidence that emotions are not simply contagious. First, research suggests that people who mimic the emotional expressions of others do not blindly copy them. Instead, emotional mimicry is selective: People do not mimic emotions unless they want to affiliate with the sender. The strongest evidence for the selectiveness of emotional mimicry comes from an experiment in which affiliative motives were primed (Huntsinger, Lun, Sinclair, & Clore, 2009). The moods of participants were better matched to the mood of a confederate in the affiliative priming than in the control condition. Other evidence comes from studies showing that, under conditions in which affiliative motives would seem to be reduced, both vocal and facial mimicry of emotions were lower than under control conditions (e.g., Weisbuch & Ambady, 2008; Weyers, Mühlberger, Kund, Hess, & Pauli, 2009). In these studies, emotional mimicry was lower when the participant competed with the other person, or also when the other person was an outgroup member.

Second, research suggests that emotional spreading may not be due to mimicry at all, but instead involves more cognitive processes (see e.g., Barsade, 2002). This cognitive route has been called “social referencing”, a phenomenon first demonstrated with infants (Sorce, Emde, Campos, & Klinnert, 1985). The idea is that one person’s emotions spread to the next, because they are informative about the nature of the situation. In the original experiments, the mother’s fearful face informed the infant that a visual cliff should not be crossed, whereas the mother’s happy face informed the infant that it was safe to cross.

Social referencing plays a role in adult dyads as well. In studies modelled after the visual cliff study, dyads of friends played a computer game, in which they gained points by maximally inflating a balloon, at the risk that the balloon would pop. One friend’s fear expressions (either naturally occurring or manipulated) were found to affect the other friend’s risk taking, very much like the mothers’ fear face affected their babies’ risk taking in the visual cliff task (Parkinson, Phiri, & Simons, 2012). Similarly, in a diary study, participants reported on their appraisals and emotions after making a joint decision with an interaction partner. Participants’ appraisals and emotions were both informed by the emotions of the interaction partner, who separately reported on the same joint decision (Parkinson & Simons, 2009). In summary, social referencing studies suggest that emotional spreading occurs when the emotion of the partner provides information that is relevant to the receiver. However, due to the absence of control conditions, they do not allow for the stronger conclusion that emotional spreading only occurs when the emotion of one partner is informative.

The combined research on dyads thus suggests that the spreading of emotions is a selective and, at times, cognitive process, where the emotions of one partner inform the emotions of the other. The current study applies these insights to groups, and...
thereby challenges earlier theories that characterised the spread of emotions in crowds as an automatic and unavoidable process (LeBon, 1896). More specifically, we hypothesise that only emotions that bear shared relevance to different group members will spread, because they are the ones to receive attention from other group members. The hypothesis resonates with group theories on affective integration, which posit that group members will converge on affective characteristics to the extent that these characteristics are relevant and meaningful to the group (Moreland, 1987; Moreland, Levine, & Wingert, 1996). In the current study, we compare the spread of an emotion that is relevant to the group with one that is not.

GROUP PRIDE VERSUS SELF-PRIDE

We compare the spreading of two types of pride in groups. Pride is an emotion that occurs when an important task is successfully completed (e.g., Williams & DeSteno, 2009). We will compare the spreading of self-pride with that of group pride.1

Self-pride occurs when a person attributes the success of an important task to him- or herself (Weiner, 1986). It is an emotion that enhances a person’s social standing and creates a positive distinction between an individual and others around him or her (Sander & Scherer, 2009; Tracy & Robins, 2007a). The prototypical body posture that accompanies feelings of pride, namely a tilted head and expanded body posture, can be thought to reflect this social dominance (Mesquita & Polanco, 2009; Tracy & Robins, 2007b). Pride motivates sustained effort (Pekrun, Elliot, & Maier, 2009; Williams & DeSteno, 2009).

In contrast, group pride occurs when a person attributes progress or success on a task to the joint efforts of the group. Although group pride may not be completely independent of self-pride, the focus of these two emotions differs: self-pride relates to the achievements of an individual group member; group pride refers to the achievements of the group as a whole (Zander, Fuller, & Armstrong, 1972). At any one time, a particular group member may experience self-pride and group pride to different degrees. For instance, group members may feel proud about the group’s achievements, but not as satisfied with their own contribution; conversely, group members may feel proud of their personal achievement, but disappointed with the group performance.

We hypothesised that the spreading of emotions is not “blind”. On the one hand, we expected that, over time, group pride would spread among the members of a group, because each member’s group pride would be relevant to the other group members. This is the case because the referent of group pride is shared among the different members of the group. On the other hand, we did not expect that self-pride would spread to other members. The object of self-pride is not shared between group members, and pride itself underlines the difference between different group members, as it signals a status differential (Dickens & DeSteno, 2014; Tiedens, Elssworth, & Mesquita, 2000). Thus, self-pride may increase the distance rather than create a shared perspective between interaction partners, and therefore, it will not spread.

ASYMMETRIES IN THE SPREADING OF EMOTIONS

The spreading of emotions may not be “blind” in yet another way: Based on previous findings, we

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1 Previous research has distinguished two forms of pride: authentic and hubristic pride (Tracy & Robins, 2007a, 2007b, 2007c). In the current research, we studied authentic pride, which has been found most relevant in achievement contexts. In the first study, we used a two-item pride scale (as described in the Method section) containing the two most common words for pride in Flemish Dutch. One of these words (“fier”) can only be used in the sense of authentic pride; the other word (“trots”) can on occasion refer to hubristic pride. However, both the mean ratings and high correlation between the items make it more plausible that participants used it to express authentic pride. Moreover, in both studies, pride items were positively associated with self-esteem and collective-esteem respectively, which is another indication that they pertained to authentic pride (Tracy & Robins, 2007c, Studies 2 and 7).
expect that high-status group members have more impact on the emergent group emotions than low-status members. First, low-status members are generally more oriented towards high-status members than the opposite, as suggested by the finding that low-status partners of dyads have a better recall of the non-verbal behaviours of high-status partners than the reverse (Hall, Carter, & Horgan, 2001). In the context of group emotions, this would imply that low-status group members will attend more to high-status members’ emotions than the reverse (Hareli & Rafaeli, 2008). Moreover, low-status partners of dyads rely more on high-status members when taking decisions (e.g., Oldmeadow, Platow, Foddy, & Anderson, 2003) and converge more towards the emotions of the high-status partner than vice versa (Anderson, Keltner, & John, 2003). The combined evidence leads us to predict that low-status members of groups will adjust their emotions more to the emotions of high-status members than the other way around. In the current research, we test the hypothesis that status of a group member predicts the extent to which the group member’s emotions, and particularly group pride, spreads to other group members.

OVERVIEW OF THE STUDIES

To test the idea that emotions are not always contagious, we conducted two longitudinal studies. In both studies, we followed groups of students working on a group assignment from the beginning to the end of their collaboration. In both studies, we tested the hypothesis that group pride, but not self-pride, would spread among group members. In the first study, we tested the mutual cross-lagged associations between the group’s and individual group members’ group pride (and self-pride); in the second study, we used social network analysis to examine the spread of group pride (and self-pride). In addition, we used the longitudinal network analysis to test whether status ties predicted the spreading of emotions; we expected low-status members to adjust to the level of group pride (but not self-pride) of high-status members.

STUDY 1

In a first longitudinal study, we tested the hypothesis that, over time, group pride, but not self-pride spreads among group members. The study followed students collaborating on a semester-long group assignment and measured self-pride and group pride at four different points in time during the process of collaboration.

Method

Participants

Two hundred ninety-five second-year psychology students at a Dutch-speaking university in Belgium participated in this four-wave study. The students were part of 68 task groups that each counted 4–6 members ($M = 4.93; SD = 0.31$). Of all students who agreed to participate, 88.1% (at Time 4, week 13) to 98.0% (at Time 1, week 2) completed the questionnaire; 83.7% of the participants took part in the whole study. Participants with and without complete data were not significantly different from each other on the variables of interest [Little’s (1988) missing completely at random test; $\chi^2(168) = 183.90$, ns]. Therefore, all participants who completed at least one questionnaire were included in the analyses. Participants received €10 upon full completion of the study and €3 upon partial completion of the study. On average, participants were 20.39 years old (SD = 1.20) and 88% of them were women, reflecting the composition of the student body.

Procedure

Over the course of a semester (13 weeks), participants collaborated on a group assignment (designing research) for a Methods course. Their assignment was to design both a qualitative and a quantitative study; in the course of the 13 weeks, they received feedback from the course leader once (between week 4 and week 10) and during a public presentation of their research design another time (between week 10 and week 13). The course constituted a large and important part of the curriculum. In addition, the group assignment
counted for 90% of students’ final grade (10% of their final grade was based on their individual contribution to the group project) and students reported working on the project for an average of 4.36 hours a week (SD = 2.37). About one third of this time ($M = 1.45$ hours; SD = 1.25), they worked together with the whole group. Students were able to monitor and evaluate their progress throughout the project, based on the two feedback moments as well as on standards for progress as were laid out in the course manual. Students did not receive any information on their grades until after the end of the project.

The study consisted of four online questionnaires at different times during the semester chosen to coincide with important junctures of the group project: after a literature review in week 2 (Time 1); after formulating research questions in week 4 (Time 2); after collecting and analysing the data in week 10 (Time 3); and after handing in the research report in week 13 (Time 4).

Measures

Individual members’ self-pride and group pride. At each time point, participants were asked to indicate to what extent they had felt self-pride or group pride while collaborating with the other members of their group since the last measurement on a 5-point Likert scale ranging from 1 = very weakly to 5 = very strongly. Pride was measured by two Dutch synonyms of pride (“trots”, “fier”). Participants rated both self-pride and group pride on either item (pride about my group: “trots op de groep”, “fier op de groep”; pride about myself: “trots op mezelf”, “fier op mezelf”). Scale reliability was high for both self-pride and group pride, and this was true across the different time points (see Table 1). Table 1 summarises the means, standard deviations, reliabilities and within-time correlations of self-pride and group pride at the different time points.2

The group’s self-pride and group pride. To control for an individual’s own (self or group) pride, we calculated the level of the group’s pride for each individual separately by excluding the member’s own pride ratings. Thus, at each measurement point, the group’s (self or group) pride was calculated by averaging the intensity ratings of the other group members’ (self or group) pride.

Analyses

We used structural equation modelling to test the mutual influence between individual members’ feelings of pride and the group’s feelings of pride (Farrell, 1994). Since group members were nested within task groups, we specified multilevel models to take the non-independence of the observations into account (Hox, 2002). Figure 1 illustrates the general model tested.

The cross-lagged paths of the model tested our main hypotheses (paths $d$ and $e$ in Figure 1). In

Table 1. Means, standard deviations, reliabilities and within-time correlations for self-pride and group pride (Study 1)

|                  | Week 2       | Week 4       | Week 10      | Week 13      |
|------------------|--------------|--------------|--------------|--------------|
|                  | M (SD)       | Spearman–Brown coefficient | M (SD)       | Spearman–Brown coefficient | M (SD)       | Spearman–Brown coefficient | M (SD)       | Spearman–Brown coefficient |
| Self-pride       | 3.12 (0.64)  | 0.85         | 3.17 (0.71)  | 0.87         | 3.37 (0.72)  | 0.90         | 3.47 (0.67)  | 0.81         |
| Group pride      | 3.45 (0.76)  | 0.87         | 3.52 (0.81)  | 0.87         | 3.52 (0.94)  | 0.91         | 3.53 (1.00)  | 0.93         |
| Within-time correlation | 0.45*** | 0.52*** | 0.41*** | 0.34*** |

Note: For two-item scales, Spearman–Brown coefficients are preferred over Cronbach’s $\alpha$ to assess scales’ reliability (Eisinga, te Grotenhuis, & Pelzer, 2013).

***$p < .001$

2 A table with the correlations between individual members’ and the group’s self-pride and group pride across different time points can be found in the Online Supplementary Materials (Table S1).
estimating these cross-lagged effects, we controlled for within-time correlations and autoregressive paths (paths a, b and c in Figure 1).

Model specifications. Model fit was evaluated in two ways: a root mean square error of approximation (RMSEA) smaller than .10, and preferably smaller than .06; and a comparative fit index (CFI) higher than .90, and preferably .95, indicate a good model fit (Hu & Bentler, 1999; Kline, 2005). We compared structural equation models with varying degrees of restrictions. Since we were interested in general patterns across time and had no hypotheses on differential effects between time points, we restricted the paths across time. We started by freely estimating all within-time correlations, the autoregressive paths, the cross-lagged paths; in later models, we restricted several of these paths. A nested, more constrained model was accepted if the change in RMSEA was smaller than .015 and the change in CFI was smaller than .01 (Cheung & Rensvold, 2002; Vandenberg & Lance, 2000). The final model was the most restrictive model that still fit the data well, because this model is the most parsimonious.

Results

Feelings of group pride travel between group members across time

To test the hypothesis that feelings of group pride travel between group members and become spread within groups, we used a fully cross-lagged model (see Figure 1). The model confirmed our hypothesis (Figure 2): Over time, group members influenced each other’s feelings of pride about the group. Not only did group feelings of group pride at one time predict individual members’ group pride at the next, but individual members’ feelings of group pride also predicted the group’s group pride. Moreover,
intra-class correlations (ICCs; Kenny, Kashy, & Bolger, 1998) at all times were significant for group pride (see Table 2), suggesting that members within groups were more similar to each other with regard to the group pride than members from different groups. We conclude that the level of group pride was shared among the members of a group.

**Feelings of self-pride do not travel between group members across time**

We tested the hypothesis that self-pride does not travel between group members using another fully cross-lagged model (see Figure 1). Consistent with our hypothesis, individual members’ self-pride and the group’s self-pride did not mutually influence each other over time (Figure 3). Moreover, the ICC values for self-pride were in no case significant, suggesting that the level of self-pride was no more similar between members from the same than a different group (see Table 2). We conclude that self-pride was not shared among group members.

**Discussion**

This study provides evidence that only group-relevant emotions spread in groups. We followed 68 real life, interactive task groups from the beginning to the end of their group project. In the course of 13 weeks, group members reported 4 times on their self-pride and their group pride. Multilevel cross-lagged path analyses revealed that group pride, but not self-pride, spread among group members. Consistently, ICCs suggested that the levels of group pride, but not self-pride, were more similar between members of the same group than they were between members of randomly different groups.

Although Study 1 clearly shows that group pride, but not self-pride, spreads among group members, a limitation of the first study is that the groups were very homogeneous with respect to age and ethnic distribution; moreover, the majority were female students. In the second study, we addressed this limitation by studying groups with more ethnic diversity and with a majority of male students. In addition, we extended our findings by studying the role of group members’ status in the spread of emotions.

**STUDY 2**

The second study aimed to replicate and extend the findings of the first study. First, we set out to replicate the finding that group pride, but not self-pride, spreads among group members. We followed the emotions of task groups over time. Like the groups in Study 1, the groups in Study 2 consisted of university students who worked on a group assignment, but the groups in Study 2 differed from those in Study 1 with respect to gender distribution and ethnic diversity.

Second, we sought to extend the findings of the first study by investigating the influence of status on emotions. More specifically, we tested whether the emotions of group members would be more likely to spread to the extent that these group members were perceived as influential by other group members. This hypothesis is consistent with earlier findings showing that high-status individuals receive more attention and influence the emotions of others more compared to low-status individuals (Anderson et al., 2003; Hall et al., 2001; Oldmeadow et al., 2003).

| Table 2. Significance tests for ICCs and variance at the group level for feelings of pride (Study 1) |
|---------------------------------------------------------------|
| **Week 2** | **Week 4** | **Week 10** | **Week 13** |
| **Self-pride** | ρ = .08 | ρ = .01 | ρ = .03 | ρ = 0 |
| Χ²(1) = 3.42; p = .06 | Χ²(1) = 0.05; p = .82 | Χ²(1) = 0.45; p = .50 | χ²(1) = 0; p ≈ 1 |
| **Group pride** | ρ = .24 | ρ = .15 | ρ = .26 | ρ = .38 |
| Χ²(1) = 22.33; p < .001 | Χ²(1) = 8.47; p = .003 | Χ²(1) = 18.56; p < .001 | Χ²(1) = 36.51; p < .001 |
Combining these two study aims, we hypothesised that, over time, group members’ levels of group pride assimilate towards those of group members with more status; we did not expect similar effects of status for self-pride. In order to test the effect of status on the spreading of emotions, we made use of longitudinal network analysis. This type of analysis provides a more fine-grained analysis of how emotions become spread in groups by studying emotional spread via dyadic relationships within groups rather than studying emotional spread between an individual group member and the rest of the group (cf. Study 1).

**Method**

**Participants**

Participants were engineering students at a French-speaking university in Belgium. The participants were members of 33 task groups who collaborated on a group project that extended over 6 months. During this period, participants completed three questionnaires at different time intervals. We excluded 6 of the original 33 groups from the longitudinal network analysis, because 2 or more group members failed to complete the questionnaires at 1 or more times. The final sample consisted of 27 task groups, together counting 168 freshmen and 27 seniors; the seniors were each assigned to be the leader of a group. The groups consisted of four to seven group members (\( M = 6.00; \ SD = 0.83 \)) and one group leader. Group members’ mean age was 18.5 (SD = 1.18) and 80% were men; group leaders’ mean age was 22 (SD = 2.03) and 63% were men. All group members volunteered to participate.

**Procedure**

Participants were recruited during the launch session of an engineering course. In this course, groups of freshmen engineering students designed, under the guidance of a senior engineering student, a technical device that heated water by means of physical activity (e.g., pedalling or rowing). The students jointly designed and built the device, after which they documented their work in a written report, as well as presented the prototype to an external jury.

The project was a large and important part of students’ curriculum. On average, the participants reported working on the project on average 4.73 hours a week with the whole group (SD = 3.96) and 4.67 hours by themselves (SD = 4.18). Throughout the project, students were able to gauge their progress from feedback from their group leader at weekly meetings, from feedback from the course tutor in the middle of their collaboration (in week 11, between the first and second measurement), and by comparing their progress to standards that were clearly laid out. Students did not receive any information on their grade until after the end of the project. All group members received one grade, unless a group...
member failed to contribute, in which case (s)he received a lower grade.

All materials were in French. Questionnaires from Study 1 were translated and back-translated from Dutch into French, with small exceptions as described below. Participants completed the questionnaire 3 times, in week 7, week 21 (with 6 weeks of holidays and exams in between) and in week 24 (after presenting their work to the external jury).3

Measures

**Individual members’ emotions.** Pride was measured with one item (“fier/fière”). Participants rated both self-pride and group pride on this item. The difference with Study 1 was due to the fact that French, unlike Dutch, has no synonyms for pride. Table 3 summarises the means, standard deviations and within-time correlations of self-pride and group pride.4

**Status.** Status was operationalised as having (or not having) influence ties in a social network (e.g., Anderson, John, Keltner, & Kring, 2001; Bendersky & Shah, 2012). In each group, participants rated how influential each other group member was in the group, using a rating scale from 1 = not at all to 5 = very much. We subsequently dichotomised the influence ratings into having or not having an influence tie [1 = “tie” (higher end of the scale: 4, 5); 0 = “no-tie” (mid-point and lower end of the scale: 1, 2, 3)]. Dichotomising the influence ratings was necessary in order to use them in the longitudinal social network analysis programme, simulation investigation for empirical network analysis (SIENA), which does not, yet, allow for longitudinal analysis of network data with continuous ties. A group member’s overall status was measured by the number of incoming ties (in-degree centrality; Scott, 1991): the number of group members who perceive this person to have an influence on the group. The number of outgoing ties describes the group member’s overall tendency to assign others influence ties (out-degree centrality; Scott, 1991).

Analyses

In order to investigate how status networks (i.e., influence ties between group members) influence the spreading of self-pride and group pride, we used the modelling techniques of SIENA (R Development Core Team, 2013; Ripley, Snijders, & Preciado, 2013; Snijders, van de Bunt, & Steglich, 2010). SIENA models make use of the overall dynamics in the data to estimate, simultaneously, changes in influence ties (i.e., changes in the network structure), changes in levels of pride, and the joint changes of both influence ties and pride between time points. In other words, SIENA models test, over time, whether changes in influence ties predict changes in pride levels (i.e., influence effects), as well as whether changes in pride levels predict changes in influence ties.

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3 Although we aimed to make the spread of the questionnaire as equal as possible between the measurement moments, there are differences in the time gaps between the questionnaires. We aimed to have the first questionnaire after the group already worked together for some time. We chose week 7 out of practical considerations, because at that time, the group leaders had the opportunity to hand out the questionnaire to their group members. The large time gap between the first wave (week 7) and the second wave (week 21) was due to a large holiday and exam break of six weeks in between. We decided to distribute the second questionnaire four weeks after the break, so that group members got used to work together again. Finally, the last questionnaire was handed out to the group members immediately after they presented their work to an external jury (week 24), thus right before their group’s dissolution.

4 A table with the correlations between self-pride and group-pride across different time points can be found in the Online Supplementary Materials (Table S2).
(i.e., selection effects), while controlling for structural network mechanisms and changes in the levels of pride.

To test whether group members adjust their group pride, but not their self-pride towards those members they perceive as influential, we modelled influence effects for each type of pride separately, controlling for network effects (for instance, a tendency to evaluate those members as influential who are evaluated as influential by others as well), covariate effects (for instance, a tendency of leaders to be evaluated as more influential) and selection effects (for instance, tendency to see people who have higher levels of pride as more influential). Our hypothesis is confirmed when group pride, but not self-pride, spreads through influence ties.

Results

Table 4 summarises the results for the respective SIENA models of self-pride and group pride. The significance of each effect was tested by a $t$ ratio obtained by dividing the value of the parameter estimate by the value of the standard error of this estimate (Snijders, 2001). In Table 4, we only show the results that are particularly helpful to the interpretation of our findings.\(^5\)

Consistent with our hypotheses, high-status group members (i.e., group members with a higher number of incoming ties) have a larger impact on the feelings of group pride of their fellow group members, compared to lower status group members (Table 4, parameter 1); these status effects were not found for self-pride (Table 4, parameter 1).

Moreover, as in Study 1, we expected that group members would have similar levels of group pride, but not self-pride. In line with these expectations, the ICC values at each time point are significant for group members’ group pride, but not for their self-pride (see Table 5).

Control variables

First, influence ties appear to be a good measure of status: (1) group members attribute influence to only few other group members (Table 4, parameter 2) and (2) group members also tend to agree among themselves on who is influential within their group (Table 4, parameter 3). Therefore, the group appears to agree on a small number of high-status members.

Table 4. Estimations and standard errors tested in the network model for self-pride and group pride (Study 2)

| Nr. | Effect                                                                 | Self-pride | Group pride |
|-----|------------------------------------------------------------------------|------------|-------------|
| 1   | Does the pride of a group member who is perceived as influential by another group member, predicts the pride of that other group member? | 0.38 (0.25) | 0.68 (0.19)**|
|     | **Effect of interest**                                                 |            |             |
| 2   | Do group members form many ties with other group members?              | -2.59 (0.52)** | -2.46 (0.60)** |
| 3   | Do group members agree on who is influential within their group?       | 1.11 (0.14)** | 1.09 (0.15)** |
| 4   | Is there a change in influence ties between week 7 and week 21?        | 4.29 (0.52)** | 4.44 (0.50)** |
| 5   | Is there a change in influence ties between week 21 and week 24?       | 2.89 (0.29)** | 3.03 (0.33)** |
| 6   | Is there a change in the pride levels between week 7 and week 21?       | 1.45 (0.20)** | 2.89 (0.69)** |
| 7   | Is there a change in the pride levels between week 21 and week 24?      | 2.09 (0.38)** | 2.49 (0.47)** |
| 8   | Do group members who are evaluated as influential by many other group members experience more (or less) pride? | 0.00 (0.05) | -0.12 (0.05)* |
| 9   | Do group members with higher (or lower) levels of pride evaluate more other group members as influential? | 0.15 (0.10) | 0.24 (0.12)* |

Note: The numbers in the table represent estimates and their standard errors (between brackets).
†$p < .10$; *$p < .05$; **$p < .001$.

\(^5\) The complete models that we tested can be found in the Supplementary Online Materials (Tables S3 and S4).
Second, the influence network as well as the feelings of both self-pride and group pride are dynamic across time (Table 4, parameters 4–7). This implies that there is room for mutual influence, which makes it all the more meaningful that there is no such influence for self-pride.

Third, high-status group members—that is, members who are perceived as influential by a relatively high number of other group members, tend to experience lower levels of group pride (Table 4, parameter 8). In contrast, group members who feel group pride perceive a larger number of other group members as having influence on the group (Table 4, parameter 9).

Discussion

This study provides further evidence that only group-relevant emotions spread in small groups. We followed 27 real life, interactive task groups during the major part of their collaboration. In the course of 17 weeks, group members reported 3 times on their self-pride and group pride; at all 3 moments, the group members also reported whom they perceived to be influential in their respective groups.

Consistent with Study 1, we found that the levels of group pride, but not of self-pride, were more similar between the members of the same group than between random individuals from different groups. Similar to Study 1, we found that group pride, but not self-pride, spreads across the different group members. Thus, our second study replicates the findings from Study 1 with groups that differ with respect to gender and ethnic composition. Moreover, our second study also replicates the findings from Study 1 despite that Study 2 was conducted in a different language (French in Study 2 as compared to Dutch in Study 1).

Study 2 also examined the effects of status differentiation on the spreading of emotions. Across time, high-status group members affected other group members’ feelings of group pride; or put differently, the group’s feelings of group pride assimilated to the level of group pride felt by the most influential group members. The finding is consistent with couple research, in which the emotions of the lower-status partner (i.e., the partner who had the least influence in the relationship) were found to converge towards the emotions of the higher-status partner (Anderson et al., 2003). Our findings similarly suggest that group members’ emotions (i.e., group pride) converge with the emotions of high-status group members (i.e., group members perceived to be more influential in the group).

The relationship between status and group pride is complex and needs further study. On the one hand, high-status group members, on average, have comparatively low levels of group pride; therefore, their influence is limiting rather than encouraging of group pride. High-status group members’ lower levels of group pride may be understood from the fact that they may be the most competent group members and that they are less satisfied with the group’s achievements. Consistently, we found that the high-status group members (at $T_i$) were less satisfied with the group’s achievements (at $T_{i+1}$) than the group members with less status (scale means for high-status members: $MW_{T_7-T_{21}} = 3.55$ and $MW_{T_{21}-T_{24}} = 3.89$; scale means for low-status members: $MW_{T_7-T_{21}} = 3.78$ and $MW_{T_{21}-T_{24}} = 3.99$; $F(1, 171) = 5.07, p = .03$ between week 7 and

| Table 5. Significance tests for ICCs and variance at the group level for feelings of pride (Study 2) |
|------------------------------------------------ ------------------------------------------------- |
| Week 7                          | Week 21                          | Week 25                          |
| Self-pride                    | Group pride                      |                                  |
| $\rho = .03$                  | $\rho = .15$                     | $\rho = .15$                     |
| $\chi^2(1) = 0.42, p = .52$  | $\chi^2(1) = 7.39, p = .007$  | $\chi^2(1) = 7.39, p = .007$  |
| $\chi^2(1) = 2.87, p = .09$ | $\chi^2(1) = 16.20, p < .001$ | $\chi^2(1) = 9.71, p = .001$ |
week 21, $F(1, 174) = 1.12, p = .29$ between week 21 and week 24). On the other hand, group members experiencing high group pride are relatively generous in their attribution of influence to others; therefore, feeling good about your group is tantamount to perceiving others’ influence and may paradoxically mean that you are more inclined to converge towards their (generally lower) levels of group pride.

Our finding that high-status individuals affect the group’s levels of group pride resonate, but do not overlap, with the results from an earlier study on the influence of team leaders (Sy, Côté, & Saavedra, 2005). In the study by Sy et al. (2005), group leaders did influence the feelings of their group members. In the current study, we could not directly test whether group leaders influenced the feelings of their group members. However, in our study, group leaders were not perceived as more influential than other group members ($\beta = .13, SE = .14, p = .82$), and thus may not have influenced the feelings of these other group members. It is possible that leaders in the study by Sy et al. (2005) were perceived to be more influential to the group than other group members. Future research will need to disentangle the relationship between formal leadership and status. It is possible that only informal leaders (i.e., members with status) influence other members’ emotions regardless of whether they also hold a formal leadership position.

**GENERAL DISCUSSION**

In two longitudinal studies, we studied the spreading of emotions in real life, interactive task groups. By studying feelings of self-pride and group pride of group members from the beginning until the end of their collaboration, we were able to map influence patterns between group members across time. Our results challenge a contagion account of group emotions. We replicated across two studies that group pride, an emotion that is similarly relevant and important to different group members, spreads, but also that self-pride, an emotion that lacks a common referent, does not.

In a sense, our findings offer support for the idea that only those emotions that touch upon the group’s concerns can be considered “group emotions” (Kuppens & Yzerbyt, 2014). Moreover, group emotions spread whereas other emotions do not. Therefore, these findings are consistent with a social referencing account, and not with a (blind) contagion view of group emotions.

Our findings also fit early theorising on the social integration of group members, which holds that group members become similar on characteristics that are salient; that is, characteristics that “are relevant to group members’ outcomes or lend meaning to their experiences” (Moreland et al., 1996, p. 26). ICCs showed that within-group similarity in group pride, but not in self-pride, was significant from the beginning. Although changes in ICCs were not completely linear, there is generally within-group convergence of group pride over time; no such convergence was seen for self-pride.

The current study is the first to take a dynamic approach to the spread of emotions in task groups. Group researchers have advocated this approach for some time now (e.g., Barsade & Gibson, 2012; Kelly & Spoor, 2006; Van Kleef, Homan, & Cheshin, 2012), but even longitudinal studies on emotional similarity in dyads and groups have so far failed to focus on temporal changes, and instead focused on within-time associations (e.g., Anderson et al., 2003; Totterdell, 2000; Totterdell et al., 1998). We took changes over time into account, using two different designs. Our designs allowed us to test different models of the spreading of emotions in a more conclusive way.

**Limitations and future research**

There are some limitations to this study. The most obvious one is that both studies followed groups of students collaborating on a course assignment. Although the task groups in Studies 1 and 2 differed with respect to gender and ethnic composition, university major and linguistic community, they both function within an educational context. Future research is needed to test whether
the findings hold outside of the educational context as well.

A second limitation is that we followed task groups for a limited time only (13 weeks in Study 1 and 17 weeks in Study 2), after which the groups were dissolved. It may be interesting to study processes of emotional influence across longer existing task groups to see whether group members influence each other’s emotions continuously, whether they do not influence each other anymore after a while or whether there are recurring cycles of influence and stabilisation. For instance, the length of the commitment was one of the parameters that was different in studies that found or failed to find emotional convergence in romantic couples (Anderson et al., 2003 versus Gonzaga, Campos, & Bradbury, 2007). When couples have been together for a long time, they may have reached an optimum level of emotional similarity after which they did not converge anymore. This is consistent with the idea that groups go through a period of storming—i.e., conflict between members—before they arrive at a period of norming, in which group members adjust to each other (e.g., Tuckman, 1965). It is between these two stages of group formation that adjustments—and emotion spreading—are thought to occur.

A third limitation is our exclusive focus on the emotion of pride. Future research needs to examine whether the distinction between self-focused and other-focused emotions holds for other types of emotions, such as shame, anger and gratitude. Whereas our research provides first evidence that the spread of emotions in groups is conditional upon the group-relevance of these emotions, it is not yet clear which processes may lead up to emotional convergence in groups. One possibility is that group members’ group-relevant emotions inform the other group members’ interpretation of the situation (e.g., the progress made on the group assignment). This interpretation may then feed into the other group members’ own emotions. This possibility would be closest to the social referencing perspective that we have proposed. Alternatively, group members’ emotions may inform the norms of how to feel. In fact, we have found (for other emotions than the ones currently reported) that group members’ emotions informed the group emotion norms, which in turn again shaped group members’ emotions (Delvaux, Vanbeselaere, & Mesquita, 2015; see also Kelly & Barsade, 2001).

Little is known as yet about the factors that facilitate or inhibit spread. We have shown that the emotions of high-status group members spread more readily than the emotions of members with lower status. However, other factors may be operational in the spread of emotions in groups. At the interpersonal level, the quality of the relationship between interaction partners can be an important factor for emotional convergence, with emotions spreading more readily when group members are closer or more identified with each other (Hess & Fischer, 2013). Of course, there may be individual differences that affect group spread as well. Members who are highly identified with their group may be more susceptible to be emotionally influenced by other members of their group (Tanghe, Wisse, & van der Flier, 2010), and conversely, group members who engage in interpersonal emotion regulation are more likely to influence. For instance, deliberately trying to improve the emotions of an interaction partner indeed makes the emotions of the interaction partner more positive (Niven, Holman, & Totterdell, 2012).

Finally, emotional convergence is only one scenario: Under some conditions, other group members may also challenge, resist or merely respond to the emotions of an individual in the group (e.g., Elfenbein, 2014; Hareli & Rafaeli, 2008; Van Kleef, 2009). It is not clear under what circumstances group members either adopt similar emotions or respond with different emotions or challenge.

Conclusion

Previous cross-sectional research has found that the members of task groups are emotionally more similar than chance; yet, the conditions under which such similarity emerges are unknown. Moreover, existing group research has examined within-group similarity of general positive (and
sometimes, negative) emotion and failed to differentiate between distinct positive (or negative) emotions. The current research filled both of these gaps, studying two different types of pride longitudinally. In two longitudinal studies with natural task groups, we show that feelings of pride about the group, but not about the self, spread across group members. Together, these findings highlight the importance of studying emotional dynamics in groups and of taking into account the type of emotion when studying emotional spread in groups.

Disclosure statement

No potential conflict of interest was reported by the authors.

Supplemental data

Supplemental data for this article can be accessed here.

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