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KU LEUVEN

FACULTEIT PSYCHOLOGIE EN
PEDAGOGISCHE WETENSCHAPPEN

CENTER FOR SOCIAL AND CULTURAL PSYCHOLOGY

Emotional Convergence in Task Groups

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Proefschrift aangeboden tot het verkrijgen van de graad
van Doctor in de Psychologie

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Summary

Emotions are an important part of group life. When task group members work together to achieve the group's goals, these social interactions may bring about emotional similarity between group members. Whereas emotional similarity has been established in task groups, and linked to important group outcomes, very little is known on the emergence of emotional similarity. The main aim of this dissertation was to shed light on processes of emotional influence leading up to emotional similarity in task groups. More specifically, I aimed to 1) establish the process of emotional convergence –i.e., gradually becoming more emotionally similar– in task groups over time, 2) investigate selective processes emotional influence towards emotional convergence as well as the consequences for group functioning, and 3) examine individual differences in emotional influence between group members. To this end, I conducted one cross-sectional and two longitudinal studies in real-life, interactive task groups.

The results of my dissertation establish the phenomenon of emotional convergence in task groups over time. More specifically, I found that, over time, group members influenced each other's emotions such that their emotions grew to be more similar. I also found that the processes of emotional influence were selective, and that individual group members differed in the extent to which they influenced group emotions. More specifically, in contrast to the influential emotional contagion-account (cf. Hatfield et al., 1994), which posits that emotional convergence is an automatic process, I found evidence that emotional convergence is selective. First, I found evidence that emotional influence depends on a process of norming. I showed that, over time, there was a mutual relationship between group norms of emotions and the emotional experience of group members. Second, I found that emotional influence also depends on the information that is conveyed by specific emotions: those emotions that are relevant and applicable to other group members

more readily converge in groups. I found emotional convergence for anger, gratitude, and group pride, all emotions that are important to groups' functioning, and thus relevant and applicable to other group members; I found no convergence for self-pride, an emotion that was less relevant and applicable to other group members. Third, I found individual differences in the way status and emotion intensity predict emotional influence: high-status members' emotions and the most or least intense emotions within a group predicted the emotions of other group members. Fourth, I also found individual differences in the way group members have attuned their emotions with those of their group –i.e. individual differences in members' emotional fit: over time, I found a positive mutual interplay between members' group identification and their emotional fit with the group, suggesting that high group identifiers have attuned their emotions more with those of the group than low group identifiers. The latter relationship was moderated by the valence of the group climate: In a negative as compared to a positive group climate, the positive relationship between group identification and emotional fit was attenuated or even reversed. Finally, I found that specific group emotions bring about specific group outcomes: task-oriented emotions predict task outcomes, and relationship-oriented emotions predict relational outcomes.

In conclusion, this dissertation elucidates some of the emotional influence processes taking place in task groups. By taking a dynamic perspective to emotions in groups, I was able to uncover selective emotional influence processes in groups, as well as identify individual differences in emotional influence between group members. Moreover, I also demonstrated that specific group emotions predicted specific aspects of group functioning. The insights of this dissertation offer insights to practitioners and managers who want to change the emotional experience of group members in ways that may ultimately benefit group functioning.

Samenvatting

Emoties zijn een belangrijk onderdeel van het groepsleven. Wanneer groepsleden samenwerken om de groepsdoelen te bereiken, kunnen de sociale interacties tussen groepsleden emotionele gelijkheid tussen groepsleden tot stand brengen. Hoewel onderzoek reeds aangetoond heeft dat groepsleden emotionele gelijkheid kunnen vertonen, en dat deze gelijkheid gelinkt is aan groepsuitkomsten, weten we eigenlijk heel weinig over hoe emotionele gelijkheid tot stand komt. Het hoofddoel van dit proefschrift was dan ook om meer inzicht te verwerven in de processen van emotionele invloed in taakgroepen die tot emotionele gelijkheid kunnen leiden. Concreet gezien wou ik nagaan 1) of emotionele convergentie – een proces van meer emotioneel gelijk worden over de tijd– optreedt in groepen, 2) hoe selectieve emotionele invloed plaatsvindt tussen groepsleden en wat de gevolgen zijn voor groepsuitkomsten, en 3) welke individuele verschillen er zijn tussen groepsleden met betrekking tot hun emotionele invloed in groepen. Om dit te onderzoeken, voerde ik één cross-sectionele en twee longitudinale studies uit.

De resultaten van mijn proefschrift tonen aan dat emotionele convergentie plaatsvindt in taakgroepen. Concreet gezien vond ik dat groepsleden elkaars emoties beïnvloeden over de tijd, in die mate dat hun emoties meer gelijk werden. Doordat ik emoties in groepen over de tijd bestudeerde, kon ik ook processen van selectieve emotionele invloed bestuderen in interacties tussen groepsleden, alsook individuele verschillen in emotionele invloed tussen groepsleden. In tegenstelling tot een invloedrijke theorie over emotionele convergentie die suggereerde dat emotionele convergentie een automatisch en ongecontroleerd proces is (cf. Hatfield et al., 1994), toonde mijn onderzoek aan dat emotionele convergentie een selectief proces is. Ten eerste vond ik dat emotionele convergentie afhankelijk is van groepsnormen over emoties. Ik toonde aan dat er een wederzijdse relatie bestaat tussen groepsnormen over emoties en de emotionele ervaring van groepsleden over de tijd. Ten tweede vond ik ook dat het type van emotie een rol speelt in emotionele convergentie:

de emoties die betekenisvol en van gedeelde relevantie waren voor alle groepsleden spreiden gemakkelijker in groepen. In het bijzonder vond ik emotionele convergentie voor kwaadheid, dankbaarheid en groepstrots; deze emoties hebben allemaal betrekking op het functioneren van een groep. Ik vond geen convergentie voor zelftrots, een emotie die geen betrekking heeft op het functioneren van een groep. Ten derde vond ik individuele verschillen in de manier waarop status en emotionele intensiteit emotionele invloed voorspellen: de emoties van leden met een hoge status en de meest of minst intense emoties binnen een groep voorspelden de emoties van andere groepsleden. Ten vierde vond ik ook individuele verschillen in de manier waarop groepsleden hun emoties afgestemd hebben op die van de groep –individuele verschillen in de mate van emotionele fit met de groep. Meer bepaald vond ik een positieve, wederzijdse relatie tussen groepsidentificatie en emotionele fit met de groep: hoge identificeerders lijken hun emoties meer afgestemd te hebben op hun groep dan lage identificeerders. Echter, deze relatie was afhankelijk van het groepsklimaat: in een negatief groepsklimaat werd de positieve relatie tussen groepsidentificatie en emotionele fit zwakker, of zelfs tegengesteld in vergelijking met een positief groepsklimaat. Tenslotte vond ik ook dat specifieke groepsemoties gepaard gingen met specifieke groepsuitkomsten: taakgerichte emoties voorspelden taakuitkomsten, en relationele emoties voorspelden relationele uitkomsten.

Samenvattend belicht dit proefschrift enkele processen die onderliggend zijn aan emotionele convergentie in taakgroepen. Door een dynamisch perspectief aan te nemen om emoties in groepen te bestuderen, kon ik processen van selectieve emotionele invloed blootleggen, alsook individuele verschillen in emotionele invloed tussen groepsleden. Bovendien toonde ik ook aan dat specifieke groepsemoties specifieke aspecten van het groepsfunctioneren voorspellen. Deze inzichten bieden de kans aan managers en mensen uit de praktijk om deze inzichten te gebruiken om de emoties van groepsleden te beïnvloeden, wat uiteindelijk ten goede kan komen aan het functioneren van groepen.

Dankwoord

Volgens sommige theorieën bestaat het leven uit cycli van zeven jaar, cycli waarin mensen zich lichamelijk, psychisch en geestelijk ontwikkelen. Als deze theorieën kloppen (maar dit dient nog empirisch onderzocht te worden, geloof ik), ben ik met dit doctoraat aan het einde gekomen van zo'n levensfase. Zo voelt het althans wel. Tijdens deze levensfase ben ik bijgestaan door een aantal belangrijke mensen, die ik bij deze graag zou willen bedanken.

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Introduction



1.1. Introduction

Once upon a time, in the heart of Doetinchem, a small town in the Netherlands, there was a heart-shaped tower, called the D-tower. The D-tower was an art project, based on a collaboration between a visual artist by the name of Q. S. Serafijn and an architect, named Lars Spuybroeck. Every other night, the D-tower would change color, with the new color representing the emotion that the inhabitants of the town had reported as most intense on that day. For instance, when the most important emotion among the Doetinchem inhabitants had been happy, the tower's lights would be blue at the end of the day. In contrast, when Doetinchem's inhabitants felt anxious, the tower's lights would turn yellow at the end of the day. The color of the D-tower's lights represented the emotions that were at the heart of the Doetinchem inhabitants on a particular day. It reflected the collective emotional experience of individuals sharing group membership. In this dissertation, I address the processes underlying the collective emotional experiences of group members –in this case being a member of the Doetinchem community. But before doing so, I introduce the topic of emotions in groups.

Emotions are part and parcel of the life of groups. This is nicely illustrated by the feedback I received from some of the students about working together in groups after one of my studies:

> To my opinion, this assignment was not a "group assignment". There was enough "assignment", but no "group" to work on it. ... I finished the second assignment myself, because the other group members were too busy fighting over the fact that they did a poor job. At the start, we were a group of friends, but after the assignment,

> there were multiple ruptures within the group, and we did not trust each other anymore.
>
> It was a nice and pleasant experience to be part of this group. Conflicts were rare and solved easily. ... Although the assignment was both hard work and difficult, working in this group made it a lot easier.

Although these testimonials do not make explicit mention of emotions, it is clear that the first one describes a negative emotional experience in a group, and the second one a positive emotional experience in a group.

Many early scholars of groups made reference to emotions, yet often these emotions were seen as contributing to the irrational and uncontrollable nature of groups. Group emotions were thought of as powerful forces taking possession of individual members' minds, and directing these members' feelings, thoughts and actions (LeBon, 1896). The view of groups as irrational entities has dominated social psychology far into the twentieth century. For instance, in 1969, Philip Zimbardo contributed to a symposium in which he discussed his famous Stanford Prison Experiment under the title "The human choice: individuation, reason and order, versus deindividuation, impulse and chaos". In his view, individuation equals rationality, and deindividuation, or becoming part of a larger whole, equals irrationality.

Only with the 'cognitive turn' to group psychology (e.g., social categorization and social identity theory; Hogg & Abrams, 1988; Tajfel & J. C. Turner, 1986; J. C. Turner, Hogg, Oakes, Reicher, & Wheterell, 1987), feelings, thoughts, and actions that were rooted in group membership were normalized and considered as rational. As such, a more balanced view on groups developed: Rather than only bringing out the

worst in their members (cf. LeBon, 1896), groups can also bring out the best in their members (Ellemers, 2012).

This dissertation is about emotions in groups. Unlike the approach of the earliest group scholars, my approach is in line with the more recent view on (emotions in) groups, namely that they are functional, not irrational. My research is premised on the understanding that emotions play an important role in the social life of people. The research in this dissertation maps the ways in which emotions become coordinated in groups, and investigates both how this coordination evolves and what its outcomes are.

Emotions in Groups and Organizations

My research is part of the "affective revolution" of organizational science, that marks a renewed interest in the study of emotions in group and organizational life (Barsade, Brief, & Spataro, 2003). It will build on recent advancements in emotion science on the one hand, and on previous research on emotions in groups and organizations on the other. These two lines of research have in common that they view emotions as potentially functional processes. This view is in sharp contrast with the traditional characterization of emotions as irrational, evil forces in groups.

Following recent research in emotion science, I consider emotions as relational phenomena. Emotions occur in interactions with others, and in addition, they are constituents of these interactions. Emotions position an individual in the relationship (Elfenbein, 2014; Fischer & Manstead, 2008; Frijda & Mesquita, 1994; Hareli & A. Rafaeli, 2008; Keltner & Haidt, 1999; Mesquita, Marinetti, & Delvaux, 2012; Parkinson, Fischer, & Manstead, 2005; Tiedens & Leach, 2004; Van Kleef, De Dreu, & Manstead, 2010). For instance, expressing anger means to blame another

person for an undesired outcome, and to demand that he/she restores the harm (Frijda, Kuipers, & Terschure, 1999). Conversely, expressing gratitude means to credit another person for a desired outcome, and wanting to repay him/her (e.g., Algoe, Haidt, & Gable, 2008). These examples demonstrate that emotions are relational phenomena that position the individual in the relationship. In turn, other people respond to an individual's emotions, and this affects the course of the relationship between the individual and these others. For instance, other people tend to accommodate an individual when he/she is angry, resulting in relative power of the individual in the relationship (e.g., Van Kleef, De Dreu, & Manstead, 2004). Conversely, other people reciprocate an individual's gratitude, resulting in closeness in (both new and ongoing) relationships (Algoe, Gable, & Maisel, 2010; Algoe et al., 2008). Just as emotions have been found to shape relationships in dyads (Boiger & Mesquita, 2012; Mesquita, 2010), I expect them to shape intra-group relationships as well.

Whereas emotions may thus be seen as unfolding in relationships between interaction partners, and shaping these relationships, another research tradition posits that social interactions are not a necessary condition to experience emotions as a group member. This research tradition is anchored in a social identity perspective (cf. Ellemers, 2012 for a review), and conceives of emotions in groups as category-based feelings. For instance, individuals can feel emotions based on their membership of different social categories such as being a 'woman', a 'student', a 'Belgian', etc. Indeed, research has shown that individuals feel distinct emotions upon the activation of different social identities (e.g., Mackie, Devos, & E. R. Smith, 2000; Ray, Mackie, Rydell, & E. R. Smith, 2008; Yzerbyt, Dumont, Wigboldus, & Gordijn, 2003); and that group members converge towards a prototypical group emotion (E. R. Smith, Seger, &

Mackie, 2007). Emotional similarity based on group membership is not only demonstrated by self-report studies, but it is also suggested by neurological research. For instance, when individuals perceived in-group members, but not out-group members to be sad, the same brain regions were found to be active as when they themselves were sad (Gutsell & Inzlicht, 2012). This may be so, because in-group members are more motivated to empathize with or take the perspective of fellow in-group members as compared to out-group members.

According to this category-based emotion perspective, group members' emotions become similar via a top-down process, shaping the emotional experience of individual group members so that it is in line with the group norm. However, emotional similarity between group members may also be the result of a bottom-up process, when group members contribute their individual experiences to the collective emotional experience of their group (cf. emergent group identities; Meeussen, Delvaux, & Phalet, 2014; Postmes, Haslam, & Swaab, 2005). This bottom-up approach is grounded in the idea that group members may reach convergence around an emergent group norm when they interact with and influence each other, and is consistent with the view of emotions as inherently relational phenomena. In group contexts, social influence processes in ongoing interactions (i.e., bottom-up processes) can be best studied in small, interactive groups rather than in large, category-based groups. Therefore, I followed small, interactive groups over time, which allowed me to investigate both top-down and bottom-up processes underlying the emotional similarity of group members. As such, this dissertation bridges different literatures on emergent group identities and on emotions as relational phenomena.

Another strand of research on emotions in groups has focused on outcomes of emotional similarity rather than on processes underlying emotional similarity. It has demonstrated that a) emotional similarity in groups exists, and that b) group emotions resulting from members' emotional similarity are related to group outcomes. First, many studies have demonstrated similarity of emotional experience among teammates or group members (Barsade, 2002; Barsade & D. E. Gibson, 1998, 2012; Bartel & Saavedra, 2000; Kelly & Barsade, 2001; George, 1990; Ilies, Wagner, & Morgeson, 2007; Sy, Côté, & Saavedra, 2005; Totterdell, 2000; Totterdell, Briner, Teuchmann & Kellett, 1998). Emotional similarity between group members may be grounded in members' association with the group; they may be motivated to conform to the group norm. Alternatively, it may be the result of an interactive process, whereby members influence each other and/or are influenced by each other.

Second, group emotions have been found to be consequential to the well-being and performance of groups (Ashforth & Humphrey, 1995; Keltner & Haidt, 1999). Groups that, on average, reported higher levels of positive affect also reported less conflict, more cooperation and higher performance than groups reporting lower levels of positive affect, and had lower absenteeism rates (Barsade, 2002; Barsade, Ward, J. D. F. Turner, & Sonnenfeld, 2000; George, 1990; Totterdell, 2000). In contrast, groups that, on average, reported higher levels of negative affect showed relatively less task coordination as well as engaged in fewer self-reported prosocial behaviors than groups reporting lower levels of negative affect (George, 1990; Sy et al., 2005).

In sum, members of groups report similar emotional experiences, and this emotional similarity is consequential for group functioning. However, less is known about how emotional similarity comes about.

Building on the insights that emotions are relational phenomena, that emotions can be based in group membership, and that group emotions can impact group functioning, I investigate how social influence processes bring about emotional similarity, as well as how the resulting emotional similarity is consequential for the well-being and productivity of groups.

Preview of this Dissertation

This dissertation is centered around three research aims. A first aim is to go beyond establishing similarity in the emotions of different group members and to investigate whether, over time, emotional convergence takes place in groups. A second aim is to study selective emotional influence processes towards emotional convergence as well as the consequences for group functioning. More specifically, I aim to examine whether normative and informative emotional influence processes facilitate emotional convergence in groups. In addition, I aim to investigate the consequences of emotional similarity –i.e., emergent group emotions as a result of emotional convergence– for group functioning. A third aim is to investigate individual differences in emotional influence between group members. Figure 1.1 provides a graphical presentation of the three research aims. The research focus will be on task groups, a type of group where group members need to communicate, collaborate and negotiate with each other in order to complete the group's tasks (Guzzo & Dickson, 1996, Lickel et al., 2000).

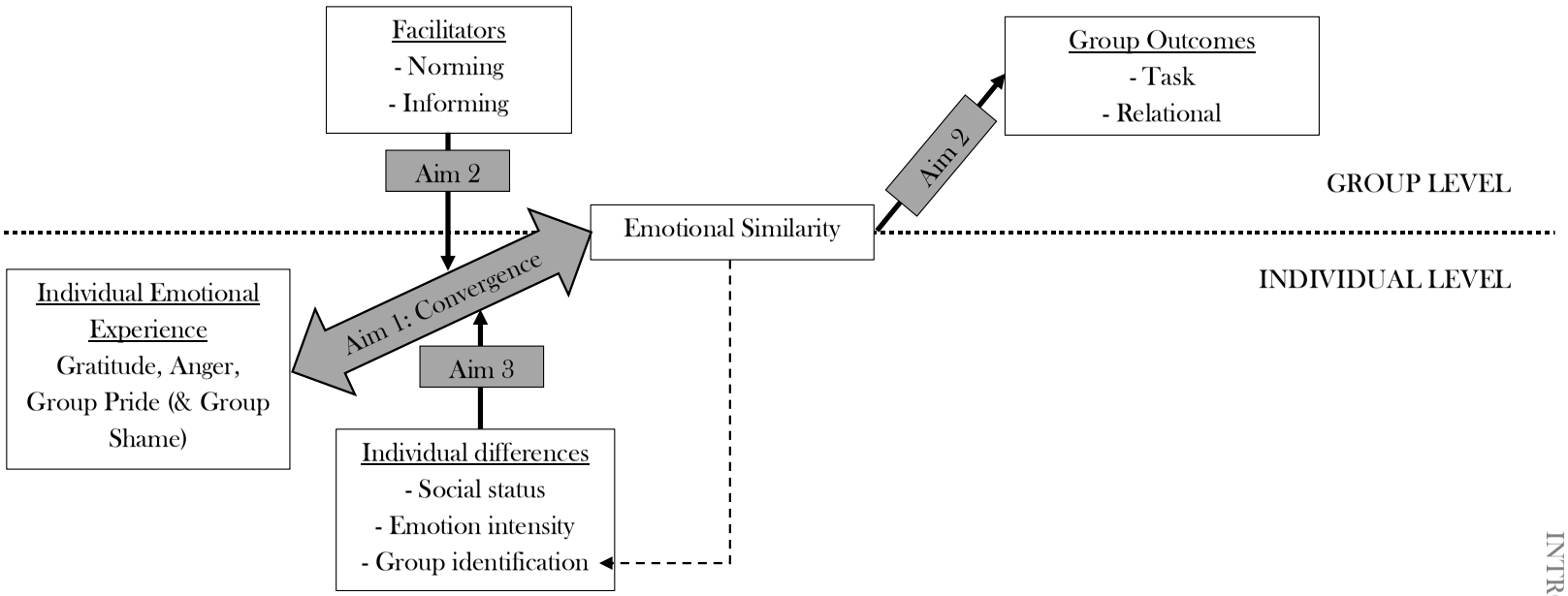

Figure 1.1 Overview of research aims 1, 2 and 3

1.2. Research aims

Emotional Convergence in Task Groups over Time

In the first part of this dissertation, I aim to demonstrate emotional convergence in task groups. To date, there is no direct evidence that the emotions of the members of task groups converge over time, but different strands of research point to the within-group similarity of emotions of emotions. However, this previous research did not study whether within-group emotional similarity resulted from self-selection (i.e., people with similar emotions choose to form a group) or processes of social influence (i.e., people within a group influence each other's emotions so that they become similar over time). Within-group similarity of emotions has been found for both positive and negative emotions, as well as for different types of task groups. Some research has simply demonstrated that the emotions of group members are more similar than could be expected on the basis of chance (e.g., Bartel & Saavedra, 2000; George, 1990; Sy et al., 2005). Other research shows that the mood of one team member can be predicted from the mood of the other team members (Ilies et al., 2007; Totterdell, 2000; Totterdell et al., 1998). Although both types of studies show that the emotions of different group members are inter-related, they do not provide direct evidence for the processes that are responsible for emotional similarity within groups.

To my knowledge, only one study on groups has documented the process more closely (Barsade, 2002). In this study, a confederate was instructed to be either in a positive or in a negative mood. The study provided clear evidence for emotional influence in groups: The emotions of other group members became more positive when the confederate displayed positive emotions, and more negative when the confederate

displayed negative emotions. Thus, the emotions of the group members changed in the direction of the confederate's emotions, suggesting that the group members' emotions converged towards the emotion of the confederate. This process of emotional convergence has also been demonstrated in research on dyads. Anderson, Keltner and John (2003) studied romantic couples as well as college roommates and found that, over a period of six to nine months, these dyads grew more emotionally similar. There is thus some first evidence that task group members show emotional convergence over time.

In my dissertation, I aim to establish the process of emotional convergence in task groups over time. To this end, I conducted two longitudinal studies that followed task groups during a collaborative project (see also Table 1.1, data sources 2 and 3). By studying the emotions of group members over time, I am able to document (both bottom-up and top-down) processes of emotional influence in groups, turning emotions into a collective property of the group. As such, I take a dynamic perspective rather than the predominant static perspective that has guided most research on interactive groups (Collins, Lawrence, Troth, & Jordan, 2013; see M. A. Cronin, Weingart, & Todorova, 2011 for a similar argument in favor of studying groups dynamically). M. A. Cronin and colleagues (2011) suggested that taking a dynamic perspective on group development indeed entails recognizing that "individual elements can affect group-level properties, and group-level properties can also affect the individual elements" (p. 572).

Selective Emotional Influence towards Emotional Convergence and Consequences for Group Functioning

In the second part of this dissertation, I aim to shed light on (a) the processes of emotional influence that contribute to emotional convergence, and (b) the consequences of (specific) group emotions for group functioning.

Selective emotional influence facilitates emotional convergence

There are different theories on how interaction partners influence each other's emotions. One influential theory that has guided much of the theoretical and empirical work on emotional convergence is the theory of emotional contagion. This theory posits that people have "the tendency to automatically mimic and synchronize facial expressions, vocalizations, postures, and movements with those of another person, and consequently, to converge emotionally" (Hatfield, Cacioppo, & Rapson, 1994, p. 5). The theory goes back to the late 19th century, and is reflected in Gustav LeBon's proposal that "in a crowd, every sentiment and act is contagious" (p. 10). According to the emotional contagion account, emotions are like a disease: When two people are in contact, emotions spread automatically and unbeknownst to the people involved.

More recent theories suggest that emotional convergence is not as automatic as previously assumed by the emotional contagion account. These theories have in common that emotions do not transfer to others, unless others recognize them as information relevant to either themselves, or to a situation that is of joint relevance. According to the Affective Process Theory (Elfenbein, 2014), one of the ways in which emotional convergence occurs is when the members of dyads or groups experience a situation from the same perspective, and end up appraising it in the same

way[1]. Similarly, according to social appraisal theories (Parkinson, 2011; Parkinson, Phiri & Simons, 2012; Parkinson & Simons, 2009), emotions converge when interaction partners interpret a situation in similar ways (= shared appraisals). Finally, according to the Emotion-Mimicry-in-Context account (Hess & Fischer, 2013, 2014), interaction partners mimic each other's emotions, among others, when (a) the relationship between interaction partners is one of cooperation rather than competition, and (b) when it is defined in terms of in-group versus out-group. Thus, recent emotion theories propose that emotional convergence between interaction partners is a selective process that is contingent on a shared appraisal of the situation.

Building on the recent research on dyads showing that emotional convergence is a selective process, I outline two ways in which emotional influence may be selective in groups, namely via processes of norming and informing. More specifically, in this dissertation, I will investigate whether other members' emotions are norming and informing individual members' own emotions; and vice versa, whether individual members' own emotions are norming and informing other members' emotions too. These mutual influence processes may then lead to emotional convergence in task groups.

[1] Note that a shared appraisal is not a necessary condition for the occurrence of emotional convergence between interaction partners. Emotions may also converge when the emotions of one interaction partner serve as a stimulus for the emotions of the other interaction partner, thus eliciting convergence through affective reactions rather than through shared appraisals (cf. complementary affective linkage; Elfenbein, 2014).

Normative emotional influence. Social norms refer to rules about how people ought to behave in specific social situations. By coordinating people's behavior, social norms ease 'social traffic', just as driving norms facilitate traffic on the road. In some situations, norms are spelled-out and thus clear to everyone. For instance, everyone knows that athletes should follow the rules of fair play in sport settings. In other situations, where it is less clear how to behave, people may infer the norms from the behaviors of other people in the same situation (e.g., Cialdini & Goldstein, 2004). People often adhere to the norms of a social situation, even if these norms don't match with their actual beliefs, attitudes or feelings (Jacobson, Mortensen, & Cialdini, 2011), because this satisfies their need to belong (Cialdini & Goldstein, 2004).

Emotion norms constitute a specific type of social norms that deal with the appropriateness to express and experience emotions in social situations (e.g., Eid & Diener, 2001). Developmental studies of emotions have shown that parents teach their children emotion norms: They socialize their children to express those emotions that are appropriate within a given social context. Over time, emotion norms are internalized and become part of the emotional experience itself (Eisenberg, Cumberland, & Spinrad, 1998; Holodynski & Friedlmeier, 2006; Saarni, 2008). In the work context, so-called display rules regulate employees' emotions on the job (Hochschild, 1983). For instance, the "rule" for flight attendants is to be friendly towards customers at all times, whereas the "rule" for bill collectors is to show anger and behave in an aggressive way towards debtors (Grandey, Diefendorff, & Rupp, 2012; Hochschild, 1983). Also within specific work units, rules and norms about emotions guide the emotional expression of team members (e.g., Diefendorff, Erickson, Grandey, & Dahling, 2011). The rules governing emotional

expression in work contexts may become internalized by employees. In this way, the so-called feeling rules do not only alter the emotional expression of employees, but also alter their emotional experience (Grandey et al., 2012; Hochschild, 1983); emotion norms thus guide both emotional expression and experience. In this dissertation, I investigate whether emotion norms in task groups guide group members' emotional experience (see also Barsade & D. E. Gibson, 1998; Kelly & Barsade, 2001), which is in line with the portrayal of (emotion) norms in the literature as top-down forces that align people to behave in specific ways (e.g., Klep, Wisse, & van der Flier, 2011).

However, I also propose that group norms on emotions are constructed bottom-up from the emotional experience of group members. I expect that emotion norms are informed by group members' emotions in the same way that other types of behavior have been shown to inform norms. Indeed, it has been shown that people tend to derive how they should behave in an ambiguous situation from the behavior of another person who was present; they thus infer a norm for behavior from the actions of the other person (Cialdini, Reno, & Kallgren, 1990; Townsend, Kim, & Mesquita, 2014; Wrightsman, 1960). Therefore, I will study whether the emotional experience of group members contributes to the emergence of emotion norms.

Taking together both top-down and bottom-up approaches of emotion norms and emotional experiences in groups, I posit that the dynamic interplay between the two brings about emotional convergence around emergent emotion norms. A similar idea was put forward by Barsade and her colleagues (Barsade & D. E. Gibson, 1998; Kelly & Barsade, 2001). However, to my knowledge, the idea that emotion norms and emotional experiences may mutually construct each other over time

has never been put to the test. In sum, I propose a dynamic interplay between emotion norms and emotional experiences in groups, such that not only group norms on emotions shape individual members' emotional experiences, but also that the individual members' emotional experiences shape group norms on emotions.

Informative emotional influence. In this dissertation, I study whether the relevance and applicability of the information contained by an emotion predicts emotional convergence in groups. Emotions in social interactions are informative: They reflect interaction partners' desires and intentions. As a result, the emotions displayed in the context of social interactions will communicate information, whether they are meant to do so or not. Research has shown that interaction partners use each other's emotional expressions to inform their own emotions, judgments and behavior (e.g., Parkinson et al., 2012; Van Kleef, 2009; Van Kleef et al., 2010).

The emotions of one group member may lead to emotional convergence in the group; in this dissertation, I investigate the conditions under which they do. I propose that convergence occurs when the emotion refers to an appraisal of shared concern. For instance, group pride is an emotion referring to the achievements and successes of the group, and as such of shared relevance. One person's group pride is, therefore, likely to influence the other members' level of group pride. Not all emotions that reflect on group processes or group functioning necessarily have the group as object. In the example at the beginning of this chapter, where group members were all angry and annoyed, one group member's anger communicated that the group's underperformance was not acceptable. Convergence occurs when other group members agree with this judgment (which may not always be the case). In contrast, I expect

no emotional convergence when a group member's emotions are less personally relevant to the other group members: For instance, when a group member is sad about the death of his cat, others in the group may be empathic, but this sadness does not carry information that is personally relevant to them, and is thus unlikely to influence their own emotions.

In sum, I hypothesize that group members' emotions converge to the extent that they carry information that is pertinent to the other members in the group, and thus help develop shared appraisals among group members. This hypothesis is also in line with the theory on affective integration positing that group members will converge on those affective characteristics that "are relevant for their outcomes or lend meaning to their experiences" (Moreland, Levine, & Wingert, 1996, p. 26).

Consequences of (specific) group emotions for group functioning

Previous research has found that group emotions predict group outcomes. Therefore, when emotions become shared across group members, resulting in a group emotion, this affects group outcomes. Several studies corroborate better group outcomes in groups where members share positive emotions, whereas groups where members share negative emotions usually have worse group outcomes (e.g., Barsade, 2002; Barsade et al., 2000; George, 1990; Sy et al., 2005; Totterdell, 2000). Although this research has demonstrated that emotional valence is an important predictor of group outcomes, the field could progress by focusing on specific emotions, rather than merely on the valence of emotions (cf. Lerner & Keltner, 2000).

Appraisal theories of emotions posit that emotions are appraisals of an (emotional) situation that go beyond the valence of the situation, because they also represent assessments on other dimensions of meaning,

such as novelty, predictability, goal significance and coping potential (Ellsworth & Scherer, 2003; C. A. Smith & Ellsworth, 1985). Different emotional experiences are not only constituted of specific appraisal patterns, they also prepare for different actions (Frijda, 1986, 2007; Lazarus, 1991). Given that emotions are constituted of distinct appraisal profiles and give direction to (different types of) action, it is likely that specific emotions predict specific outcomes (Lerner & Keltner, 2000, 2001). Extending this appraisal-tendency framework to the context of small groups, I expect that specific group-emotions predict specific group outcomes.

This idea is supported by research on individual emotions and intergroup emotions that has demonstrated that specific emotions may bring about specific outcomes, and this for positive and negative emotions alike (Harth, Kessler, & Leach, 2008; Lerner & Keltner, 2001; Mackie et al., 2000; H. J. Smith, T. Cronin, & Kessler, 2008). However, research on specific emotions in the context of small groups is lacking. Given the lack of research on specific emotions within groups, I aimed to link specific group emotions to specific group outcomes.

This part of the dissertation on outcomes of group emotions focuses on two positive group emotions, which are thought to predict different group outcomes. More specifically, I related collective group pride and gratitude on the one hand with group outcomes on the other. Group pride has been connected to a group's achievements and success (Polanco & Mesquita, 2009; Pekrun, Elliot, & Maier, 2009; Zander, Fuller, & Armstrong, 1972), whereas gratitude has been found to benefit relationships (Algoe, Fredrickson, & Gable, 2013; Algoe et al., 2010; Algoe et al., 2008; Bartlett, Condon, Cruz, Baumann, & Desteno, 2012). In the context of task groups, group pride would be a more task-focused

emotion, whereas gratitude would be more relationship-focused. I also included collective self-pride to test whether an emotion that does not reflect on a group's functioning predicts group outcomes.

I predicted that group outcomes would reflect the differences in emotions. As outcome measures, I selected two task outcomes namely collective efficacy and group performance, and two relational outcomes, namely group liking and relational conflict. Consistent with the idea that specific emotions relate to specific outcomes, I expect that collective group pride will be the strongest predictor of task outcomes, whereas collective gratitude will be the strongest predictor of relational outcomes; I expect that collective self-pride will not predict any of the outcomes.

Individual Differences in Emotional Influence: Who influences whom?

I expect that processes of emotional influence are more complex in groups than in dyads. Members of dyads deal with only one relationship; emotional influence within dyads usually goes from one partner to the other. In contrast, members of interactive groups engage in different relationships, and in relationships at different levels: they may relate to other group members individually, to distinct subgroups, and to the group as a whole (Moreland, 2010). Given complex relationships in groups, emotional influence is likely to be unevenly distributed in groups and individual group members may differ in their propensities to exert –or to yield to– emotional influence.

In the third part of this dissertation, I investigate some individual differences in processes of emotional influence. More specifically, I focus on social status, emotion intensity and group identification. *Status differences* are inherent to group life. In groups, high-status members exert influence on low-status members, thus reinforcing the status

hierarchy. In this dissertation, I investigate whether emotions follow the status hierarchy; that is whether the emotions of high-status group members influence the other group members' emotions more than vice versa. In addition, I examine the role of *emotion intensity* in predicting other members' emotions. In line with research on minority influence, I predict that any single group member can influence other members' emotions to the extent that this member's individual emotion conveys a clear and distinct message or a strong signal; this would be the case when the emotion is the most or least intense one within the group. Finally, I study the role of *group identification.* The extant research suggests that high identifiers will be more open to (emotional) influence from other group members (Abrams & Hogg, 1990; Hogg, Abrams, Otten, & Hinkle, 2004). Specifically, I investigate whether –and under what circumstances– group identification predicts more emotional similarity with other group members, and whether emotional similarity in turn enhances group identification.

Social status

There may be individual differences in the extent to which group members have an impact on the emotions of other group members. Some group members may disproportionally influence the emotions of other members because they are central in the group or have an important role to play. In this dissertation, I propose that this is the case for high-status group members. In support of this proposition, low-status members have been shown to pay more attention to high-status members (Snodgrass, 1992). In addition, low-status members better recall the nonverbal behaviors of high-status members than vice versa (Hall, Carter, & Horgan, 2001), and low-status members also rely more on high-status members

when making decisions than the other way around (e.g., Oldmeadow, Platow, Foddy, & Anderson, 2003). The combined research is thus suggestive of high-status members' influence within their group. As a consequence, the emotions that high-status members experience and express may set the norm for the group, and other group members may adjust their emotions accordingly.

That the emotions of members with high status spread to other group members has been suggested by research on leaders, who can be presumed to have high status in their group. In one experimental study, where leadership was randomly assigned to one team member, the (positive or negative) mood of the team leader predicted the average mood of the team (Sy et al., 2005): The average moods of teams were positive when their leaders were in a positive mood, and negative when their leaders were in a negative mood. Other research has shown that the emotions of "charismatic" leaders transferred to their followers (Erez, Misangyi, Johnson, LePine, & Halverson, 2008). In one experimental study and one field study, Erez and colleagues (2008) showed that leaders, who were rated as more charismatic, both experienced and displayed higher levels of positive and lower levels of negative emotions. In turn, followers of happy leaders reported more positive affect, and followers of unhappy leaders reported more negative affect. Finally, one field study showed that the positive mood of a leader transferred to other group members resulting in a positive group affective tone, which in turn benefitted group functioning (Chi, Chung, & Tsai, 2011).

Evidence for the disproportional influence of high-status members of a relationship also comes from research on dyadic emotions. In two longitudinal studies, Anderson and colleagues (2003) showed that the emotions of low-status partners in both romantic couples and roommates

converged more towards the emotions of their high-status partner than vice versa. Status was either measured as having influence over the relationship (in the case of couples), or as having influence in the dormitory (as rated by co-residents). Inferring from these findings, I expect that low-status members of task groups will adjust their emotions more towards the emotions of high-status group members than vice versa.

Emotion intensity

An individual's emotions may have a disproportional impact on the emotions of others when these emotions are very intense or, in contrast, conspicuously lacking. I expect that the extremes on both ends of the intensity spectrum will determine the emotions of other people in the group. For instance, a group member who is furious might make the other members in the group more angry as well. The least happy group member may spoil the fun of the rest of the group.

There is no direct evidence for this idea, but it is appealing in the light of the literature on minority influence. High (low) intensity emotions can be seen as extreme (minority) judgments of the situation that draw special attention, and that are informative to other group members. Research on the influence of minorities in decision making has demonstrated that dissenters, who consistently disagree with the "majority" of the group, may bring about a shift in the group's opinion (for a review, see Maass & R. D. Clark, 1984). I suggest that a similar influence process may take place for group members whose emotions are more extreme than the emotions of the other members of their group. High (low) intensity emotions may have a signaling function and thus easily capture the attention of the other group members. They may inform other group members about whether a group is doing well or not, and these other

group members may change their appraisals of the situation, and adjust their emotions accordingly. Alternatively, the high (low) intensity emotions may elicit reactive emotions in fellow group members, bringing about convergence of emotions. As such, I predict that high (low) intensity emotions are relatively more likely to transfer to other group members than the emotions that are closer to the prototypical group emotion (i.e., closer to the mean or median).

It is important to note that this prediction deviates from that of earlier research that took the mean emotion as a proxy for the aggregated group emotions. Implicit in taking the mean is the assumption that the emotions of all group members contribute equally to the emotional experience of a group. In contrast, I propose that some members may have a stronger influence on the emotions of the other group members because they experience high (low) intensity emotions. The possibility that some group members may have a stronger influence on the other group members because of their emotional intensity has been recognized by several authors (e.g., Barsade & D. E. Gibson, 1998; Totterdell et al., 1998), but has, to my knowledge, never been studied empirically.

However, in a recent review of the literature on the deleterious effect of one negative group member on the whole group, it is suggested that one of the negative behaviors of such a group member, namely the expression of negative emotions, can trigger negative emotions in all other group members. It thus appears that one bad apple can spoil the whole barrel (Felps, Mitchell, & Byington, 2006). Furthermore, there is also indirect evidence for the role of one extreme group member in shaping the emotions of other group members. In the study by Barsade (2002) discussed above, participants' mood moved into the direction of the mood displayed by a confederate. Since the confederate was instructed to display

distinct moods within his group, it is plausible that he displayed the most intense emotions in his group, causing the others to change their emotions into his direction. In sum, I expect that the most or the least intense emotions in groups will influence the emotions of other group members.

Group identification

There may be individual differences in the fit of a member's emotions to the average group emotions. Group members may be motivated to attain emotional fit, since it has been shown to be beneficial for people. For instance, at the dyadic level, romantic partners who were more emotionally attuned to each other, reported higher relationship satisfaction (Anderson et al., 2003; Gonzaga, Campos, & Bradbury, 2007; Verhofstadt, Buysse, Ickes, Davis, & Devoldre, 2008; Zajonc, Adelmann, Murphy, & Niedenthal, 1987). Other dyadic research with unacquainted pairs has also pointed to the positive effects of emotional fit: Emotional fit increases the level of satisfaction with an interaction (Locke & Horowitz, 1990), and it buffers stress in a threatening situation (Towsend, Kim, & Mesquita, 2014). Also, seeing emotionally congruent faces activates brain regions that are associated with reward processing (Kühn et al., 2011). At the cultural level, emotional fit with one's culture is related to higher levels of well-being (De Leersnyder, Mesquita, Kim, Eom, & Choi, 2014; De Leersnyder, Kim, & Mesquita, 2015). Finally, at the team level, in a study on top management teams, employees matching the team's positive trait affect were more satisfied with the interpersonal relationships in their team (Barsade et al., 2000). Although research thus provides evidence that it is beneficial to have emotions that are in line with those of others, the mechanisms underlying emotional fit are less clear.

One factor related to individual differences in emotional fit with the group is group identification. Indeed, in research with teams of nurses, accountants or cricket players, team members who were more committed to their team showed stronger emotional fit as compared to their less committed counterparts (Totterdell, 2000; Totterdell et al., 1998); commitment may be taken as a proxy for group identification. Similarly, in teams of service employees, the emotions of high team identifiers were more closely linked to the emotions of their team than the emotions of low team identifiers (Tanghe, Wisse, & van der Flier, 2010). Finally, in research among self-identified Republicans and Democrats in the US, the relationship between group members' emotional profile and the average emotional profile of their group was stronger for high than for low group identifiers (E. R. Smith et al., 2007). Evidence on the link between group identification and emotional fit is cross-sectional in nature, and therefore not conclusive on the direction of the effect. In this dissertation, I aim to establish the relationship between group identification and emotional fit by investigating whether group identification longitudinally predicts emotional fit with the group.

Conversely, emotional fit with the group may predict group identification. Being emotionally in tune suggests a similar view on the situation, activating similar values, goals and actions (e.g., De Leersnyder, Koval, P. Kuppens, & Mesquita, 2015) and may thus be an important reason to identify with the group. In fact, Barsade and D. E. Gibson (1998) coined group emotions as the 'glue that stick group members together': Within-group similarity of emotions can make group members more attracted to each other and to the group.

There is also indirect evidence to suggest that group identification may be an outcome of emotional fit. Fit points to the alignment of the self

with the group, often leading to inclusion in the group; hence, it is linked to feelings of connectedness with the group (cf. Ellemers, 2012; Hogg et al., 2004). A meta-analysis on the relationship between person-organization fit and work attitudes showed that employees' objective fit with their organization in terms of values, goals and personality characteristics predicted their commitment to this organization (Verquer, Beehr, & Wagner, 2003). Likewise, when group members' values fitted with the values of their work group at one point in time, their identification with the group increased at the next point in time (Meeussen et al., 2014). Finally, experimentally induced fit in cognition increased members' identification with minimal groups (Swaab, Postmes, Van Beest, & Spears, 2007).

The link between group identification and emotional fit particularly has been shown in an experimental study. In that study, individual group members who were instructed to experience emotions that are in line with prototypical group emotions (happy about their in-group, or angry towards an out-group), showed increased group identification afterwards (Kessler & Hollbach, 2005). Although emotional fit was not measured in this experiment, I suggest that it may have been responsible for the increased level of group identification.

The combined evidence thus suggests that group identification may result from fit. In my dissertation, I will examine whether group identification may result from emotional fit, in addition to whether emotional fit may result from group identification. I thus hypothesize a mutual relationship between group identification and emotional fit over time.

Role of positive or negative group climates. Although the bulk of the existing evidence suggests that emotional fit is beneficial to people, this evidence is largely based on research with participants who were high on positive or low on negative emotions (Elfenbein, 2014). However, it is possible that emotional fit is not (always) beneficial in negative situations. After all, under those circumstances, emotional fit would mean that the individual experiences negative emotions. In fact, several studies suggest that convergence in negative emotional contexts can be linked to negative outcomes. For instance, convergence on negative emotions between marital partners occurred more often in dissatisfying than in satisfying relationships (Levenson & Gottman, 1983). Similarly, Groth and Grandey (2012) have proposed that an initial negative exchange between a service employee and a customer may set in motion a negative spiral, and that this negative emotional linkage may decrease both the customer's satisfaction and the employee's well-being. In group contexts, Felps and colleagues (2006) proposed that when the negative emotional displays of one group member transfer to other group members, this will decrease the likelihood of positive group outcomes, such as performance and well-being.

Highly identified group members want to belong to the group, but they also have a higher stake at the group's well-being than do less identified group members. This leads to two opposite predictions for the emotional fit of high identifiers in negative conditions. On the one hand, high identifiers may show equally strong emotional fit with their group, regardless of whether the group climate is positive or negative, because of their need to belong. Since their group membership is more central to their identity (e.g., Hogg & Abrams, 1988; Tajfel & Turner, 1986), high identifiers may pay more attention to the emotions of other group members (e.g., Haslam, 2001) and adjust their emotions accordingly,

resulting in a stronger emotional fit with the group, regardless of the group climate.

On the other hand, high group identifiers may show less strong emotional fit with their group in groups with negative as compared to positive climates, because of their need to be positive. High identifiers are motivated to have positive experiences in their group (Crocker & Luhtanen, 1990; Ellemers, Spears, & Doosje, 1997; Wann & Branscombe, 1990), even in negative situations. In fact, in such situations, high group identifiers tend to engage in group affirmation strategies. For instance, high in-group identifiers recalled fewer acts of violence and aggression by in-group members (Sahdra & Ross, 2007), and felt less guilty about such acts (Doosje, Branscombe, Spears, & Manstead, 1998) than low in-group identifiers, because negative memories and feelings would have posed a threat to the positive image of their group. Staying positive about negative things that happen in the group seems an effective strategy to guarantee or to maintain good feelings about oneself (Crocker & Luthanen, 1990; Ellemers et al., 1997; Glasford, Dovidio, & Pratto, 2009). Thus, a second prediction would be that high identifiers' emotional fit with the group depends on the valence of the group climate.

In this dissertation, I aim to pitch the two opposite predictions against each other by investigating the relationship between group identification and emotional fit in groups characterized by a positive as compared to a negative group climate. I expect that the relationship between group identification and emotional fit depends on the valence of the group climate (in line with the second prediction). The findings from this study may shed new light on the established positive link between group identification and emotional fit (cf. Tanghe et al., 2010; Totterdell, 2000; Totterdell et al., 1998).

1.3. Research Design and Strategies

Data Sources

The research of this dissertation consists of three studies: one cross-sectional study in an organization, and two longitudinal studies following work groups of students during their collaboration on a joint project. The data for all studies were collected in collaboration with my colleague Loes Meeussen. The different chapters of this dissertation describe either one of the studies (Chapters 2 and 4), or combine two (Chapters 3, 5 and 7) or three (Chapter 6) of the studies. Table 1.1 summarizes sample information from the studies.

The three studies in this dissertation examine real-life, interactive task groups. Studying real groups as they naturally unfold has several advantages to studying short-living, artificial groups in the lab. Following real groups provide unique insights into the development of, and ongoing processes in, groups that cannot be captured in single-shot lab groups. In addition, whereas studies in the lab usually capture a snapshot of groups that are not central to the identity of the participants, in my studies, I followed groups that were important for their members. More specifically, I followed groups of police officers, future psychologists and engineers-to-be. The advantages of studying naturally unfolding groups also come with the disadvantage that the studies did not take place in a controlled setting.

The core of the dissertation consists of two longitudinal studies (Studies 2 and 3) of developing task groups. I followed the groups of these studies three to four times during their collaboration on a project. This design allowed me to study dynamic processes in groups and to test for the temporal direction of these processes. We used self-reports in Studies 2 and 3, and both self- and other-reports in Study 3.

Table 1.1 Sample information from each of the data sources

	Data source 1	Data source 2	Data source 3
Number of participants	789	295	206 members 33 leaders
Number of groups	85	68	33
Group size	4-33	4-6	6-8
Type of groups	Teams in an organization	Student work groups (psychology students)	Student work groups (engineering students)
Number of waves	1	4	3
Gender of participants	62% male	88% female	Members: 80% male Leaders: 63% male
Mean age	43,5 years	20 years	Members: 18,5 years Leaders: 22 years
Type of study	Cross-sectional Quasi-experimental	Longitudinal	Longitudinal
Included in chapters ...	4, 6 & 7	2, 3, 4, 5, 6 & 7	3 & 6

The first study was cross-sectional in nature. A disadvantage of this type of study is that it only provides a snapshot of team life, and will not capture the temporal dynamics of the life of groups. However, an advantage of this study is that the teams were well established, thus providing insights into groups with a history: The average team member had been part of their current team for an average of 9.8 years. In addition, by using vignettes describing positive and negative situations at work, this study uses a quasi-experimental approach and provides insights into emotional reactions to standardized situations. Besides the quasi-experimental approach, this study made also use of self-reports.

Methodological Approach

In this dissertation, I use several statistical techniques that take into account the nested nature of the variables under study. In the first study, team members are nested within their teams; in the second and the third study, different measurement moments are nested within students, and students are nested within work groups. I use multilevel analyses that take into account the non-independence between nested observations, and allow to test for effects at different levels of observation (Hox, 2002).

Whenever I tested the mutual influence between two variables over time, I estimated fully cross-lagged paths over time (Farrell, 1994), while taking into account the multilevel structure of the data. This type of analysis allows to test for the directionality of effects between variables, controlling for autocorrelations and within-time associations. By filtering out the variance of the autocorrelations and within-time associations, this type of model thus shows, over time, which variables predict other variables, coming close to the causal mechanisms underlying emotional convergence.

To test whether it is meaningful to distinguish group constructs, such as group emotions and group norms on emotions, I make use of intraclass-correlations (ICCs; Kenny, Kashy, & Bolger, 1998) and within-group agreement indices (r_{wg}; James, Demaree, & Wolf, 1984). The ICC compares variance between groups with variance within groups. A significant ICC indicates that members within groups are more similar to each other with regard to the construct than members from different groups, and thus that there is agreement among group members with regard to this construct. A disadvantage of the ICC is that it underestimates the agreement between group members when the differences between groups are small. In this case, the r_{wg} is often used to measure agreement between group members; this index is calculated for each group separately, and is thus not influenced by small differences between groups. I use ICC- and r_{wg}-indices to test for agreement among group members with regard to their emotional experience and emotion norms.

Whereas the previous analyses consider emotional convergence as a homogeneous process, this may not (always) be the case. In this dissertation, I use longitudinal network analyses to study the process of emotional convergence at a lower level of analysis, namely at the dyadic level. With longitudinal social network analysis (Ripley, Snijders, & Preciado, 2013; Snijders, van de Bunt, & Steglich, 2010), I aimed to investigate whether emotional convergence is conditional upon the influence of different group members. More specifically, I examined whether group members adjust their emotions towards those group members they perceive as influential to the group. At the same time, this type of analysis controls for structural network effects (e.g., a tendency to evaluate those members as influential who are evaluated as influential by others as well), effects of covariates (e.g., a tendency of women to evaluate

more others as influential) and selection effects (e.g., a tendency to see people with stronger emotions as more influential). Thus, a longitudinal social network analysis offers a more fine-grained analysis of the process of emotional convergence in groups by studying it via dyadic relationships rather than between one group member on the one hand and the rest of the group on the other.

1.4. Overview of the Chapters

The empirical part of this dissertation consists of six chapters (Chapters 2-7) that each address one or more of the research aims discussed above; each empirical chapter can be read as a stand-alone research article[2]. The order of the chapters largely follows the order of the research aims. Table 1.2 indicates which research aims are addressed by each chapter and which hypotheses are tested in each chapter. In a concluding chapter (Chapter 8), I will summarize and discuss the main findings of my research.

Chapter 2 presents a longitudinal study that investigates the dynamic interplay between norms and experiences of anger and gratitude in task groups. It is the first study to show that group members influence each other's emotions, such that emotional convergence takes place. In addition, this chapter also examines whether emotion norms and emotional experience mutually constitute each other over time, thus testing a first type of selective emotional influence underlying emotional convergence in task groups.

[2] Since the empirical chapters of this dissertation are written as stand-alone research articles, there is some overlap between the different empirical chapters, as well as between the empirical chapters and the introduction and the discussion.

Chapter 3 consists of two longitudinal studies on the convergence of group pride and self-pride in task groups. In Study 1, my co-authors and I investigated whether emotional convergence takes place in task groups to the extent that the emotion is relevant and applicable to all group members, investigating a second process of selective emotional influence underlying emotional convergence in task groups. We expected that group pride, an emotion that is relevant and applicable to all group members, would converge in groups over time; we expected that self-pride, an emotion that does not bear group-relevance, would not converge in groups over time. Study 2 aimed to replicate the findings of the first study. In addition, Study 2 extended the first study by investigating whether group members adjusted their emotions more towards high-status group members than vice versa, studying a first individual difference variable in the process of emotional influence in groups.

In **Chapter 4**, my co-authors and I aimed to investigate whether specific group emotions meaningfully predict group outcomes, examining the consequences of the emotional similarity that results from a process of emotional convergence. We expected that group pride, a task-focused emotion, would be the strongest predictor of task outcomes. Similarly, we expected that gratitude, a relationship-focused emotion, would be the strongest predictor of relational outcomes. We expected that self-pride would not predict any of the group outcomes, because this emotion does not reflect group concerns.

Chapter 5 consists of two studies testing whether high intensity and low intensity emotions within a group contribute to other members' emotions, and thus investigates a second individual difference variable in the process of emotional influence in groups. More specifically, in this chapter, my co-authors and I tested whether the emotions of those group

members who experienced the most (group maximum) or least (group minimum) intense emotions within their group predicted the emotions of other group members.

Chapter 6 consists of three studies that address the link between individual members' emotional fit with their group and their level of group identification, and thus examines a third individual difference variable in the process of emotional influence in groups. The first study, a cross-sectional study in a large organization, aimed to replicate previous research on the positive association between group identification and emotional fit with the group using a broader range of emotions and a stronger measure of emotional fit. With the second and third study, my co-authors and I aimed to test the directionality of the relationship between members' group identification and their emotional fit with the group using a longitudinal design. We hereby expected a mutual, positive relationship between group identification and emotional fit, such that they either reinforce or dampen each other over time.

Chapter 7 builds on the research described in Chapter 6 that investigated the mutual link between group identification and emotional fit. In two studies, my co-authors and I aimed to investigate whether the valence of the group climate modifies the association between members' group identification and their emotional fit with the group. The first study is a longitudinal study in naturally occurring groups that examines whether the level of group conflict (= operationalization of group climate) modified the relationship between group identification at one time point and emotional fit at the next time point. The second study is a quasi-experimental study where team members responded to hypothetical vignettes describing either a positive situation or a negative situation within their team (= operationalization of group climate). Also in this study, we

tested whether the relationship between group identification and emotional fit was modified by the valence of the vignette.

Table 1.2 Overview of the research aims and hypotheses

Aim	Chapter	Emotions	Study hypotheses
1. Emotional Convergence	2 3	Anger and gratitude Self-pride and group pride	– Over time, individual members' emotions influence the group's emotions and vice versa.
2. Facilitators and Consequences			
2.1. Norming	2	Anger and gratitude	– Over time, the group's emotion norms influence the group's and individual members' emotional experience, and vice versa.
2.2. Informing	2 3 3bis	Anger and gratitude Self-pride and group pride Gratitude	– Over time, individual members' emotions influence the group's emotions and vice versa, BUT restricted to emotions that bear group relevance
2.3. Consequences	4	Self-pride, group pride, gratitude	– Group emotions meaningfully relate to group outcomes: task-focused emotions will predict task outcomes, and relationship-focused emotions will predict relational outcomes
3. Individual Differences			
3.1. Social Status	3 3bis	Self-pride and group pride Gratitude	– Over time, group members adjust their emotions towards those group members they perceive as influential to the group, BUT restricted to emotions that bear group relevance
3.2. Emotion Intensity	5	Gratitude, group pride, anger and group shame	– Over time, the most (group max) or least (group min) intense emotions in groups will predict other members' emotions
3.3. Group Identification	6	Emotional fit across different emotions	– Over time, group identification and emotional fit mutually predict each other
3.2.1. Moderation by Group Climate	7	Emotional fit across different emotions	– Valence of the group climate moderates the relationship between group identification and emotional fit with the group

Dynamic Interplay between Norms and Experiences of Anger and Gratitude in Groups



This chapter is based on: Delvaux, E., Vanbeselaere, N., & Mesquita, B. (2015). Dynamic interplay between norms and experiences of anger and gratitude in groups. *Small Group Research, 46*, 300-323. doi:10.1177/1046496415576411

2.1. Introduction

People who have spent time together tend to be similar with regard to their affect, mood and emotions. For instance, studies on dyads, such as romantic couples and roommates, have found that the dyadic partners become more emotionally congruent over time (Anderson et al., 2003). Consistently, research with work and sports teams has yielded emotional similarity between the members of these teams (e.g., George, 1990; Totterdell, 2000; Totterdell et al., 1998). The similarity of group members' emotions has been taken as a starting point to consider the aggregate of the emotions of all members belonging the same group as a viable group construct, a construct which was coined *group emotions* (e.g., Barsade & Gibson, 1998). Group emotions have important consequences for the group's functioning. For instance, higher positive group affect is associated with less conflict and more cooperation (Barsade, 2002), better subjective performance (Totterdell, 2000) and lower absenteeism rates (George, 1990). Conversely, higher negative group affect is associated with a lack of team coordination (Sy et al., 2005) and less prosocial behavior (George, 1990).

Given that group members show emotional similarity and that this emotional similarity impacts the group's functioning, it is important to know how emotional similarity within groups comes about. To date, most studies on emotional similarity are cross-sectional in nature. These studies have not been able to shed light on the processes leading up to emotional similarity between group members. In the current study, we take a longitudinal approach, which enables us to study the process of group members becoming emotionally more similar over time. This process is referred to as emotional convergence (Anderson et al., 2003). Moreover,

we propose that emotion norms play a role in bringing about emotional convergence in groups. A number of scholars have suggested that group norms on emotions (i.e., the group's perceived desirability and appropriateness to experience certain emotions in the group context; Eid & Diener, 2001) underlie the emotional congruence in groups (e.g., Barsade & Gibson, 1998; Bartel & Saavedra, 2000; Kelly & Barsade, 2001). If this is the case, group members should be expected over time to align their emotions with the existing group norms. In the current research, we test this idea empirically.

In sum, the aims of the current study are (a) to establish emotional convergence over time within small, interactive task groups, and (b) to examine the role of emotion norms in the development of this emotional convergence. For the first aim, we model the reciprocal influence between the emotions of group members over time. More specifically, we examine how an individual's emotions are influenced by the emotions from others within the group context, and conversely, how others in the group context are influenced by each individual's emotions. To address the second research aim, we examined the reciprocal influence between (a) the group's emotion norms and the group's emotional experience and (b) the group's emotion norms and individual members' emotional experience.

Emotional Convergence in Task Groups

Emotional convergence in groups refers to a process whereby the members of a group become emotionally more similar over time. Despite ample evidence showing similarity of group members' emotions at one particular point in time (e.g., George, 1990; Totterdell, 2000; Totterdell et al., 1998), there is no research mapping the process of convergence as part of becoming a group (Moreland, 1987). Yet, we can only meaningfully

speak of group emotions (i.e., emotions at the aggregate level of the group) after the emotions of individual group members have grown similar.

To our knowledge, only one study has even measured change of aggregate group emotions over time (Barsade, 2002). In this study, the members of newly formed groups were randomly assigned to one out of four conditions, in which a confederate, acting as one of the group members, displayed a specific mood. The four conditions corresponded to moods in the four quadrants of the affect circumplex (Russell, 1980; high arousal-positive mood, low arousal-positive mood, high arousal-negative mood, low arousal-negative mood). A difference score suggested that the group's emotions (i.e., the average level of affect within the group) changed from a pre-measure in the direction of the mood displayed by the confederate; this was true, regardless of the mood's valence. Whereas the study did not measure emotional convergence between all group members, the results suggest that, on average, group members' moods shifted towards a target member.

Building on this study, and on evidence for emotional convergence found in dyads (Anderson et al., 2003), we hypothesize that the emotions of different group members will converge during a group's collaboration on a task. More specifically, we expect that:

> *H1: A group's emotions and the emotions of its individual members will mutually predict each other over time, such that the emotions of group members become aligned.*

By inspecting, at different time points, the intraclass correlation coefficients of members' emotional experience, which estimate the expected correlation between two members belonging to the same group

(e.g., Kenny et al., 1998), we will explore whether group members indeed become more emotionally similar to each other over time.

Anger and gratitude

In contrast to most previous studies on group emotions, we included two specific emotions rather than moods or general affect. Whereas moods and general affect do not have a clear object, emotions are always directed at someone or something. As such, emotions represent orientations towards events or people in the world, rather than merely subjective feelings within the person (Mesquita, 2010; Parkinson, 1996; Van Kleef, 2009). In the current study, we focus on the emotions of anger and gratitude during group collaboration. We selected anger and gratitude, because they differ on the dimensions of valence and social orientation (e.g., Kitayama, Mesquita, & Karasawa, 2006). Anger is generally considered as a negative emotion, whereas gratitude is positive. Moreover, anger highlights the autonomy of an individual, and is thus socially disengaging, whereas gratitude focuses on relatedness and harmony, and is thus socially engaging.

Previous research suggests that the experience of anger is often associated with blame and non-acceptance (Frijda et al., 1989; Kuppens, Van Mechelen, Smits, & De Boeck, 2003). Angry people tend to blame others for undesired outcomes, and will not accept the status quo. Several studies suggest that angry people tend to get their way: In negotiations, for instance, people concede more to angry than to happy opponents (Van Kleef et al., 2004; see also, Tiedens, 2001).

Conversely, gratitude is associated with crediting another person with a positive outcome, and "repaying a benefactor" (Algoe et al., 2008,

p. 425). A grateful person will, therefore, be more likely to accommodate his or her benefactor, and over time, this has been shown to lead to increased feelings of connectedness and relationship satisfaction in both partners. For instance, the experience of gratitude increased connectedness and relationship satisfaction of romantic couples over time (Algoe et al., 2010).

Both anger and gratitude may thus be seen as ways to regulate relationships with other people, and can be assumed to play important roles in groups (Frijda & Mesquita, 1994; Mesquita et al., 2012; Parkinson et al., 2005). Given their importance, anger and gratitude –when expressed– will be noticed by the other group members. In many cases, other group members will converge towards the expressed anger or gratitude, due to mimicking or due to consistent re-appraisal (e.g., Parkinson & Simons, 2009). As a consequence, emotional spread within groups may occur.

Emotion Norms and Emotional Experience

Emotion norms guide emotional experience

Emotion norms constitute a specific type of social norms that deal with the appropriateness to express and feel emotions in social situations (Eid & Diener, 2001). A number of scholarly reviews on group emotions have proposed that group members align their emotions with the group norms (e.g., Barsade & Gibson, 1998; Kelly & Barsade, 2001). These group norms are part of the affective context of the group that governs the emotional expression of its members. The current research focuses on the degree to which emotion norms afford emotional congruence in task groups.

That emotion norms may shape emotional experience is suggested by a number of different research domains. For instance, so-called *feeling rules* have been found to regulate emotions at the job. In her famous study on emotional labor, Hochschild (1983) described how flight attendants are told to be friendly towards customers at all times, whereas bill collectors are encouraged to behave in an aggressive way towards debtors (see also Grandey et al., 2012). Similarly, developmental studies of emotions have documented the role of parental norm-setting during interactions. Caregivers' communication of the appropriateness of certain emotions during interactions shape young children's emotional experiences and emotional expressions (Eisenberg et al., 1998; Holodynski & Friedlmeier, 2006; Saarni, 2008).

In the organizational context, rules and norms about emotions appear to socialize employees of different work units to adjust their emotional expression accordingly (e.g., Diefendorff et al., 2011). These norms thus guide the emotional expression, and perhaps also the emotional experience, of the team members (e.g., Kelly & Barsade, 2001). In line with previous studies, we thus expect that:

> *H2a: A group's emotion norms will predict both the group's emotional experience and the emotional experience of its individual members.*

The emergence of emotion norms in groups

The literature on emotion norms has generally treated emotion norms as stable entities that are external to the individual. Instead, we adopt a different conceptualization of norms in this research, one that has been proposed by scholars in organizational behavior, and that represents

emotion norms at the team level as emerging from the interactions between team members (e.g., Kelly & Barsade, 2001). This means that each individual group member, as well as their whole group, contributes to the emergence of emotion norms. However, this process has remained uncharted. We will map norm emergence in the current research.

Different processes may be thought to contribute to norm development and norm changes over time. First, group members' past experience and their expectations about the group before entering will shape their individual emotion norms. Importantly, these norms are not stable, as experiences within the group shape individual members' perceptions of the norms that are present within the group. In other words, individual group members are thought to infer norms from the emotions of the other group members in the same situation (Townsend et al., 2014; Wrightsman, 1960). Second, group norms may develop or change after critical events have taken place (Feldman, 1984). For instance, when task groups approach a deadline or encounter obstacles, there may be a higher tolerance –and thus a shift in emotion norms– for negative emotions such as stress.

In sum, we consider emotion norms as emergent, rather than as stable. Therefore, we hypothesize that:

> *H2b: The emotional experience of both individual members and of others in the group will predict the group's emotion norms.*

Interplay between emotion norms and emotional experience

Combining the previous two sections, we propose a model in which emotion norms and emotional experience dynamically shape each other. Barsade and her colleagues (Barsade & Gibson, 1998; Kelly & Barsade,

2001) have previously suggested the existence of a reciprocal and dynamic relationship between the emotion norms that are formed in groups, on the one hand, and group members' emotional experience, on the other. The current study puts this idea to the test.

Following Barsade's suggestion, we propose two ways to model the relationship between emotion norms and emotional experience in interactive task groups. On the one hand, emotion norms may afford specific emotions; they both inform and guide the group's and individual members' emotional experience. As such, group members' emotional experience conforms to the group's norms on emotions (e.g., Cialdini & Goldstein, 2004). This idea also resonates with the top-down approach to group emotions, suggesting that group-level emotion norms allow or constrain the experience and expression of specific emotions in the group context (Barsade & Gibson, 1998). On the other hand, the emotional experiences of the group members inform emotion norms. Group members then infer from the emotional experience and emotional expression of other group members which emotions are appropriate in their group and which are not. From this coordination of emotional experience, emotion norms may arise (e.g., Cialdini et al., 1990).

Thus, group members regulate their emotional experience to fit the group norms on emotions, such that the group norms on emotions are predictive of group members' emotional experience. However, group norms are not stable over time, but rather group members adjust their norms to the specific emotional practices within their group, such that the emotional experience within groups is predictive of the group's emotion norms.

2.2. Method

Participants

Participants were 295 second year psychology students, who belonged to 68 task groups of four to six students (M = 4.93, SD = 0.31). All participants completed a questionnaire at least once during a four-wave study. The participation rate of the students who volunteered to participate ranged from 98.0% in wave 1 to 88.1% in wave 4; 83.7% of the participants completed all four questionnaires. All participants who filled out the questionnaire at least once were included in the analyses, since participants with and without complete data were not significantly different from each other on the variables of interest , $\chi^2(473) = 398.19$, *ns* (Little, 1988).

Upon full completion of the study, participants received €10; upon partial completion of the study, they received €3. Participants were on average 20.39 years old (SD = 1.20). Women were 88.2% of the sample, and this reflected the composition of the student body.

Procedure

Participants were students who worked on a group assignment over the course of a semester (13 weeks). The group project was part of the sophomore methods course for psychology majors, in which they completed two psychological studies. Students reported working on the project on average 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 their whole group.

Students were highly motivated to bring the group project to a good end. The methods course is a large and important part of their curriculum. Furthermore, it was important to collaborate well, as 90% of students' final

course grade was based on the group's performance.

Participants completed an online questionnaire at four different times during the semester: (a) in week 2 (wave 1) after they had performed a literature review, (b) in week 4 (wave 2) after they had come up with their research questions, (c) in week 10 (wave 3) after they had collected and analyzed their data; and (d) in week 13 (wave 4) after they had handed in their research report.

Individual-Level Constructs

Individual emotion norms were measured using an adapted version of Eid and Diener's (2001) emotion norm scale (ranging from 1 = *not at all desirable and appropriate* to 5 = *totally desirable and appropriate*). At each measurement time, participants rated, for their group, the desirability and appropriateness of experiencing a given emotion. The stimulus statement was: "During the period since the previous measurement, how desirable and appropriate was it to feel each of the following emotions when collaborating with the other members of your group?" Anger and gratitude were each measured with two items: "anger towards the other group members" and "irritation towards the other group members" for anger, and "grateful towards the other group members" and "appreciation of the other group members" for gratitude.

Individuals' experience of anger and gratitude was measured with the same two emotion items. At each measurement point, participants reported on their experience of anger and gratitude respectively by rating their emotional experience on a scale from 1 = *very weakly* to 5 = *very strongly*. The stimulus statement was: "During the period since the previous measurement, how intense did you experience each of the following emotions when collaborating with the other members of your

group?". Table 2.1 provides an overview of the means, standard deviations, and reliabilities of individuals' emotion norms and their emotional experience at the different time points[1].

Table 2.1 Reliabilities, means, and standard deviations for experience and norms of anger and gratitude

		Spearman-Brown coefficient	*M*	*SD*
Anger experience	Week 2	0.76	1.72	0.80
	Week 4	0.80	1.88	0.87
	Week 10	0.86	2.37	1.07
	Week 13	0.86	2.50	1.12
Anger norm	Week 2	0.78	1.74	0.76
	Week 4	0.81	1.78	0.75
	Week 10	0.82	2.06	0.84
	Week 13	0.82	2.10	0.87
Gratitude experience	Week 2	0.66	3.44	0.71
	Week 4	0.70	3.42	0.70
	Week 10	0.80	3.47	0.79
	Week 13	0.78	3.52	0.83
Gratitude norm	Week 2	0.64	3.85	0.65
	Week 4	0.75	3.92	0.64
	Week 10	0.72	4.03	0.65
	Week 13	0.72	3.97	0.71

Note. Spearman-Brown coefficients are preferred over Cronbach's alphas to indicate the reliability of two-item scales (Eisinga, te Grotenhuis, & Pelzer, 2013).

[1] In Appendix A.1, two tables (Table A.1 for anger and Table A.2 for gratitude) can be found that display the intercorrelations between emotion norms and emotional experience and between different time points.

Group Constructs

Two indices that are often used to indicate agreement among group members are the intraclass correlation coefficient (ICC; Kenny et al., 1998) and the within-group agreement index (r_{WG}; James et al., 1984). The ICC compares the variance between groups with the variance within groups. When this coefficient is significant, this is indicative of substantial agreement within groups: members within groups are more similar to each other with regard to the construct than members from different groups.

A disadvantage of the ICC is that it underestimates the agreement between group members when the differences between groups are small. In this case, the r_{WG} index is often used as an indicator of agreement between group members (George, 1990). Since in our data, the overall variation is small for the emotion norms (see Table 2.1), it may be that the ICC does not fully capture the agreement among group members. Therefore, we report both the ICC indices, the median of the r_{WG} indices across groups, and the percentage of groups with a r_{WG} index higher than .50, which suggests moderate agreement (George, 1990) (Table 2.2).

Table 2.2 Intraclass correlation coefficients and within-group agreement indices for experience and norms of anger and gratitude

		ICC	Median r_{wg}	% of groups with $r_{wg} \geq .50$
Anger experience	Week 2	0.15**	0.81	85%
	Week 4	0.16**	0.74	72%
	Week 10	0.25***	0.66	65%
	Week 13	0.39***	0.66	72%
Anger norm	Week 2	0.16**	0.84	85%
	Week 4	0.07	0.81	75%
	Week 10	0.07	0.74	68%
	Week 13	0.07	0.72	78%
Gratitude experience	Week 2	0.08	0.83	88%
	Week 4	0.15**	0.84	90%
	Week 10	0.19**	0.77	87%
	Week 13	0.26***	0.80	79%
Gratitude norm	Week 2	0.00	0.83	91%
	Week 4	0.04	0.80	88%
	Week 10	0.09	0.84	90%
	Week 13	0.16*	0.88	91%

Note. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$. ICC = intraclass correlation; r_{WG}= within-group agreement index. For the within-group agreement index: values of .50 or above indicate moderate within-group agreement, and values of .70 or above indicate strong within-group agreement (George, 1990).

For members' emotional experience, all ICCs are significant at the different time points, except for gratitude in Week 2. However, at this time point, the median r_{WG} for gratitude is 0.83 and 88% of the groups show at minimum a moderate agreement ($r_{WG} > .50$) among group members. For members' emotion norms, only the anger norms in Week 2 and the gratitude norms in Week 13 have a significant ICC. However, for the other time points, the lowest median r_{WG} is 0.72 and at least 68% of the groups show at minimum a moderate agreement ($r_{WG} > .50$) among group members about the desirability and appropriateness to experience anger or gratitude. Taken together, the agreement indices thus suggest that the constructs may be aggregated at the group level.

The emotion norms of a group were calculated by averaging the emotion norms of all other group members; the individual's own ratings were excluded from this average. The same procedure was used to calculate group's emotional experience[2].

Analytic Strategy

To investigate the dynamic interplay between emotion norms and emotional experience, we used structural equation modeling. We were particularly interested in the cross-lagged paths of the model (paths *g* through *l* in Figure 2.1). More specifically, we were interested in the mutual influence between (a) the group's emotional experience and individual members' emotional experience (hypothesis 1, paths *i* and *j* in Figure 2.1), (b) the group's emotion norms and the group's emotional

[2] Group emotion norms and group emotional experience, though group-level variables conceptually, were calculated for each individual separately; we omitted the focal individual from the group average.

experience (hypothesis 2, paths *g* and *h* in Figure 2.1), and (c) the group's emotion norms and individual members' emotional experience (hypothesis 2, paths *k* and *l* in Figure 2.1). We estimated all within-time correlations and autoregressive paths to control for their effects. Furthermore, the models controlled for sex, age and number of friends by estimating paths from these variables to individual members' emotional experience at the different times (Bollen, 1989). Since individual group members were nested within task groups, multilevel models were specified for all models to take into account that observations were not independent (Hox, 2002). More specifically, we estimated a two-level model that specifies the group's emotion norms, the group's emotional experience and individual members' emotional experience at the first level, while controlling for the clustering of these variables at the group level.

In structural equation modeling, models are tested with increasing restrictions. If the more restrictive model fits the data equally well, this model is preferred over the more complex model, because it is parsimonious. The model with the best trade-off between model fit and parsimony is chosen as the final model. In our data, we first tested an unrestricted model with all variables freely estimated. Next, we compared this model with two restricted models. We restricted the variables always across time, as we were interested in general patterns across time. First, we restricted the separate paths from emotion norms to emotional experience and from emotional experience to emotion norms (separate paths *g, h, i, j, k & l* in Figure 2.1) to be equal across time. Second, we restricted the paths from emotion norms to emotional experience and from emotional experience to emotion norms to be equal to each other (paths *g, h* set equal, paths *i, j* set equal, and paths *k & l* set equal in Figure 2.1).

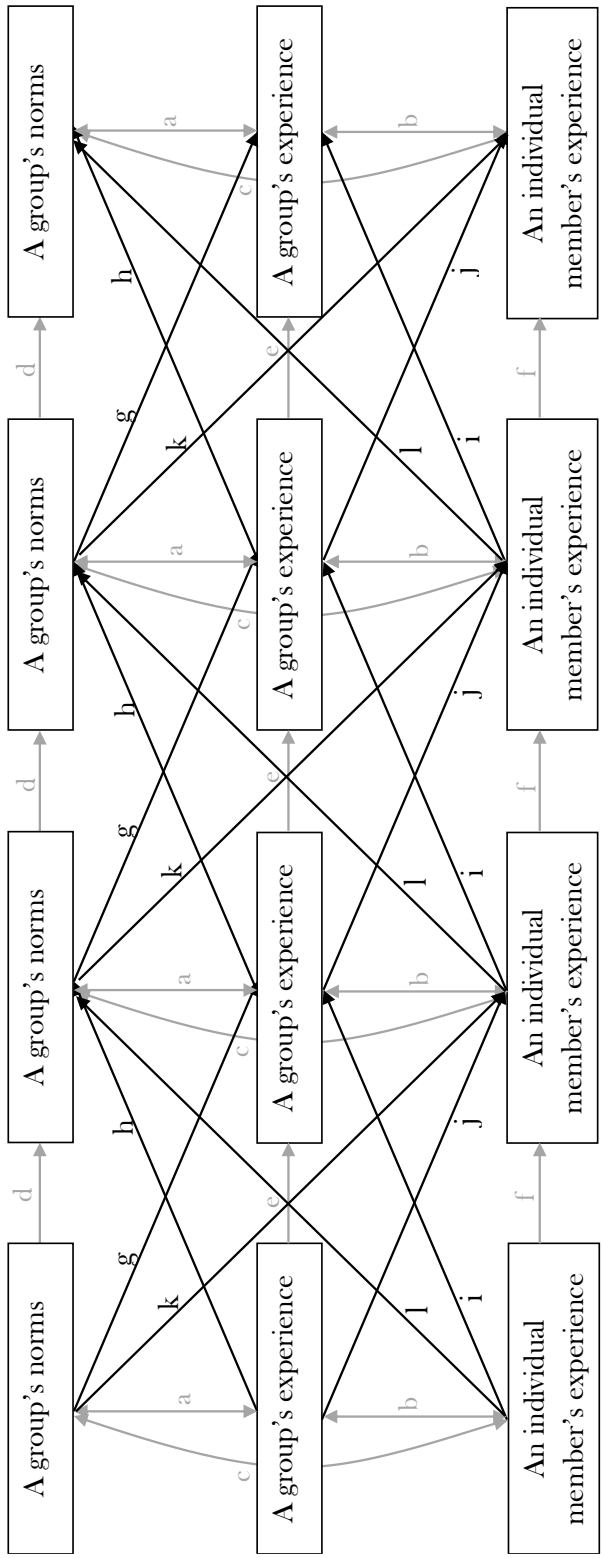

Figure 2.1 Mutual relationship between a group's emotion norms, a group's emotional experience and an individual member's emotional experience over time.

Note. Paths *a, b* and *c* refer to within-time correlations. Paths *d, e* and *f* are autoregressive or stability paths. Paths *g, h, i, j, k* and *l* are cross-lagged paths. Effects for age, sex and number of friends are also controlled for, but not presented for reasons of clarity.

To select a final model that was as simple as possible, but that still fitted the data well, each model's fit was evaluated using two common indices to evaluate model fit: (a) RMSEA-value smaller than .10, and preferably .06, and (b) CFI-value higher than .90, and preferably .95 (Hu & Bentler, 1999; Kline, 2005). We used the same indices to evaluate change in model fit when testing a restricted model: the restricted model is to be accepted if, compared to the unrestricted model, the change in RMSEA is smaller than .015 and the change in CFI is smaller than .01 (Cheung & Rensvold, 2002; Vandenberg & Lance, 2000).

2.3. Results

Preliminary Analyses

Before testing the interplay between a group's emotion norms (measured as the average perceived desirability and appropriateness to feel angry or grateful within the group) and emotional experience at both the group and the individual level, we first need to establish this relationship at the individual level. Thus, we first examine whether individual group members experience emotions that are in line with the norms they perceive to prevail in their group. Additionally, we test whether the norms individual group members perceive to prevail in their group are also informed by their own emotional experience. A fully cross-lagged model with links between individuals' emotion norms and their own emotional experience was specified.

As expected, individual members' feelings of anger and gratitude were guided by the emotion norms they perceived to be present within their group, but group members also shifted their emotion norms to fit

their own experiences of anger and gratitude (see Figures 2.2 and 2.3)[3].

More specifically, both for anger and for gratitude, individual members' emotion norms at one time predicted their emotional experience at the next time, controlling for their emotional experience at the previous time (for anger: βs = .06-.08, *SE*s = .02, all *p*s < .001; for gratitude: βs = .08-.09, *SE*s = .02, all *p*s < .001). Also, individual members' emotional experience at one time predicted the emotional norms they perceived within their group at the next time, controlling for these perceived emotion norms at the previous time (for anger: *β*s = .10-.12, *SE*s = .03, all *p*s < .001; for gratitude: *β*s = .11, *SE*s = .03, all *p*s < .001)[4]. Thus, both for anger and for gratitude, there is a reciprocal influence between individual members' emotions norms and their emotional experience.

Dynamic Interplay Between Emotion Norms and Emotional Experience

We specified a fully cross-lagged model to test (a) whether a group's emotional experience and an individual member's emotional experience mutually constitute each other across time (Hypothesis 1), and (b) whether both a group's and an individual member's emotional experience are shaped by, and in turn shape a group's emotion norms over time (Hypothesis 2).

[3] We repeated the analyses controlling for the group's standard deviation when estimating paths from group constructs. No effects for standard deviation appeared, and none of the hypothesized effects changed. However, the model fit decreased significantly when taking into account the group's standard deviation, leading to a bad model fit. Therefore, we only report the results without controlling for the group's standard deviation.

[4] In Appendix A.1, Table A.3 provides all estimates for the full model of anger, and Table A.4 provides all estimates for the full model of gratitude.

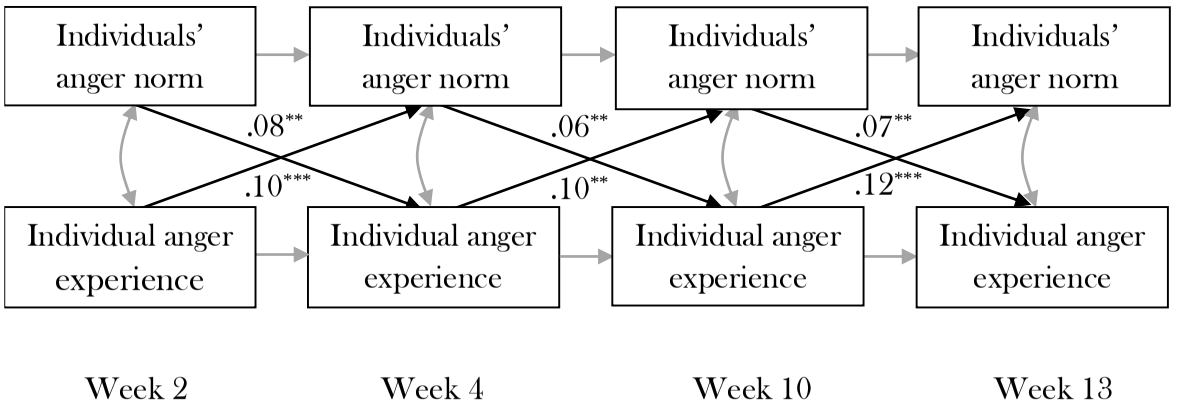

Figure 2.2 Mutual relationship between individual members' anger norms and their anger experience.

Note: ** $p < .01$, *** $p < .001$. $N = 277$. Black arrows represent cross-lagged paths (i.e., the paths of interest); grey paths represent control paths. Model fit: CFI = .96 and RMSEA = .07. Effects for age, sex and number of friends are also controlled for, but not presented for reasons of clarity. Also for clarity reasons, only the standardized betas for the cross-lagged paths are displayed. In Appendix A.1, Table A.3 presents the standardized betas for the control paths, stability paths and within-time associations of this model.

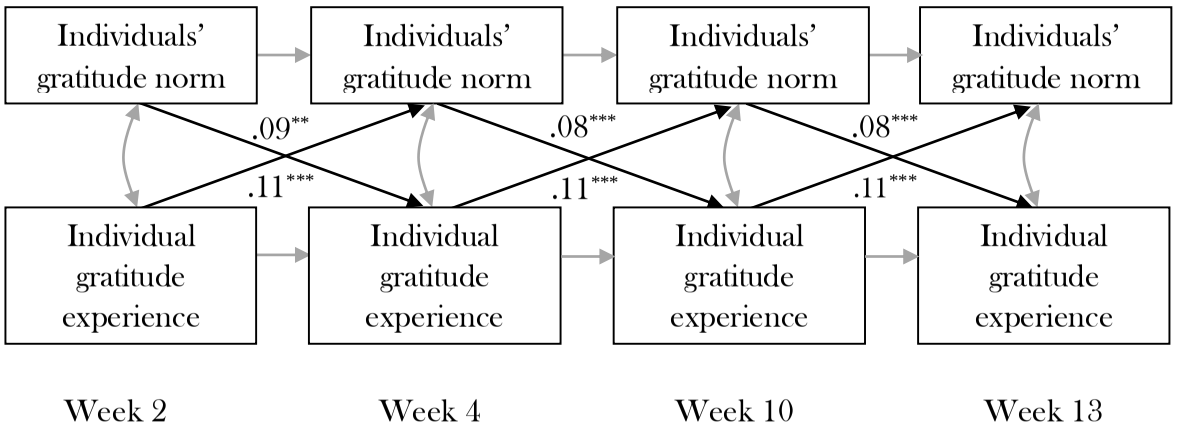

Figure 2.3 Mutual relationship between individual members' gratitude norms and their gratitude experience.

Note: *** $p < .001$. $N = 277$. Black arrows represent cross-lagged paths (i.e., the paths of interest); grey paths represent control paths. Model fit: CFI = .95 and RMSEA = .08. Effects for age, sex and number of friends are also controlled for, but not presented for reasons of clarity. Also for clarity reasons, only the standardized betas for the cross-lagged paths are displayed. In Appendix A.1, Table A.4 presents the standardized betas for the control paths, stability paths and within-time associations of this model.

The fully cross-lagged model thus estimated paths between (a) a group's emotional experience and an individual member's emotional experience (b) a group's emotion norms and a group's emotional experience, and (c) a group's emotion norms and an individual member's emotional experience.

Both for anger and gratitude, the analyses confirmed our hypotheses (see Figures 2.4 and 2.5)[5]. There was indeed a reciprocal relationship between a group's emotional experience and an individual member's emotional experience across time (Hypothesis 1). Moreover, the intraclass correlations for both group members' anger and gratitude experience were significant at each time point, except for gratitude experience in week 2 (see also Table 2.2); this suggests similarity in group members' feelings of anger and gratitude (Kenny et al., 1998). In addition, the intraclass correlations gradually increased from week 2 to week 13, suggesting that group members became more alike in their emotional experience over time–in other words, group members' emotions converged with the emotions of their group. Also, we found that a group's and an individual member's emotional experience on the one hand and a group's emotion norms on the other hand mutually predicted each other across time (Hypothesis 2).

More specifically, a group's emotional experience at one time predicted an individual member's emotional experience at the next time, controlling for an individual member's emotional experience at the

[5] We repeated the analyses controlling for the group's standard deviation when estimating paths from group constructs. No effects for standard deviation appeared, and none of the hypothesized effects changed. However, the model fit decreased significantly when taking into account the group's standard deviation, leading to a bad model fit. Therefore, we only report the results without controlling for the group's standard deviation.

previous time (for anger: βs = .06-.07, *SE*s = .02, all *p*s < .001; for gratitude: βs = .06-.07, *SE*s = .02, all *p*s < .001). Similarly, an individual member's emotional experience at one time predicted a group's emotional experience at the next time, controlling for a group's emotional experience at the previous time (for anger: βs = .11-.14, *SE*s = .03, all *p*s < .001; for gratitude: βs = .13-.16, *SE*s = .03-.04, all *p*s < .001).

In addition, a group's emotion norms at one time predicted a group's emotional experience at the next time, controlling for a group's emotional experience at the previous time (for anger: βs = .06-.08, *SE*s = .02-.03, all *p*s = .01; for gratitude: βs = .10-.12, *SE*s = .02-.03, all *p*s < .001). Similarly, a group's emotional experience at one time predicted a group's emotion norms at the next time, controlling for a group's emotion norms at the previous time (for anger: βs = .10-.13, *SE*s = .03-.04, all *p*s ≤ .01; for gratitude: βs = .16-.17, *SE*s = .04, all *p*s < .001).

Finally, a group's emotion norms at one time predicted an individual member's emotional experience at the next time, controlling for an individual member's emotional experience at the previous time (for anger: βs = .02, *SE*s = .01, all *p*s = .03; for gratitude: βs = .02-.03, *SE*s = .01, all *p*s = .01). Similarly, an individual member's emotional experience at one time predicted a group's emotion norms at the next time, controlling for a group's emotion norms at the previous time (for anger: βs = .06-.08, *SE*s = .03, all *p*s = .02; for gratitude: βs = .08-.09, *SE*s = .03, all *p*s ≤ .004)[6].

[6] In Appendix A.1, Table A.5 provides all estimates for the full model of anger, and Table A.6 provides all estimates for the full model of gratitude.

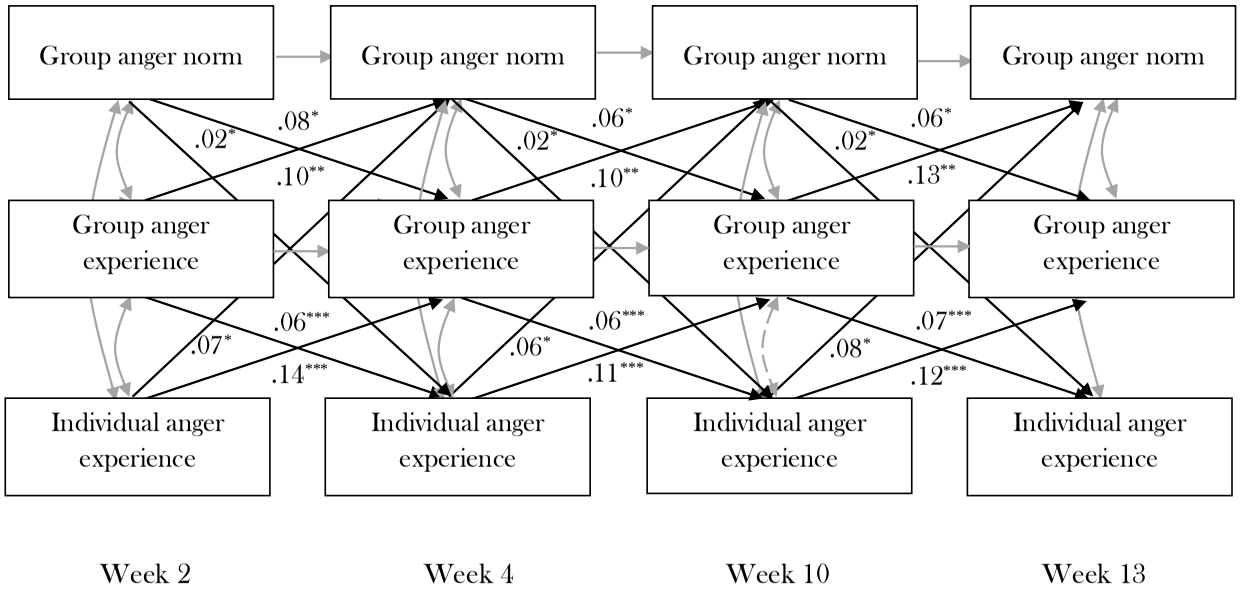

Figure 2.4 Mutual relationship between the group's anger norm, the group's anger experience and individual members' anger experience.

Note: * $p < .05$, ** $p < .01$, *** $p < .001$. $N = 276$. Black arrows represent cross-lagged paths (i.e., the paths of interest); grey paths represent control paths. Full arrows represent significant paths; dashed arrows represent marginally significant paths. Model fit: CFI = .98 and RMSEA = .04. Effects for age, sex and number of friends are also controlled for, but not presented for reasons of clarity. Also for clarity reasons, only the standardized betas for the cross-lagged paths are displayed. In Appendix A.1, Table A.5 presents the standardized betas for the control paths, stability paths and within-time associations of this model.

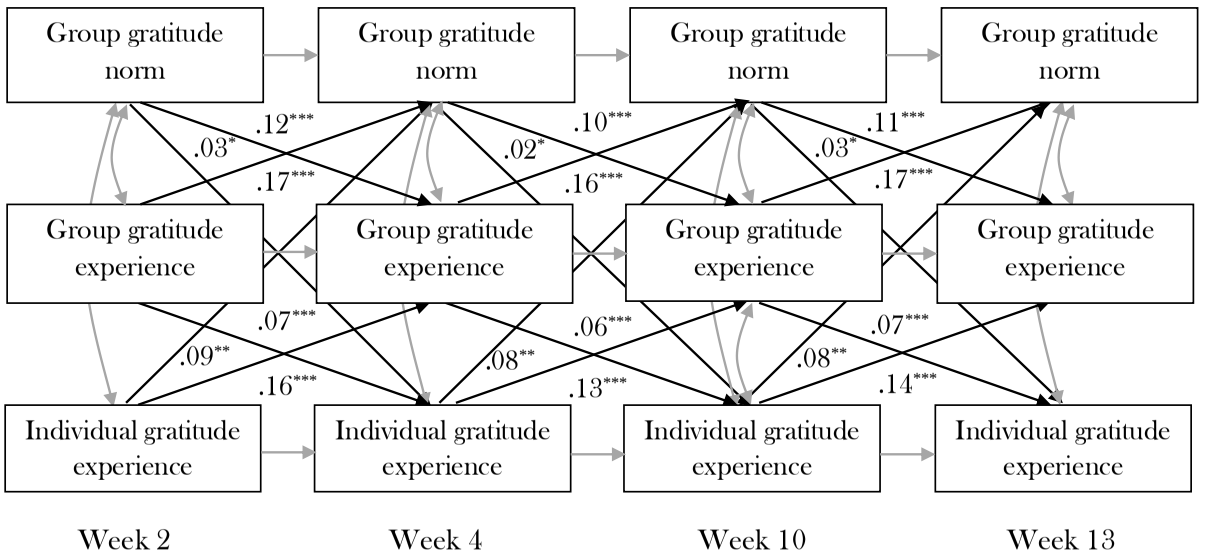

Figure 2.5 Mutual relationship between the group's gratitude norm, the group's gratitude experience and individual members' gratitude experience.

Note: * $p < .05$, ** $p < .01$, *** $p < .001$. $N = 276$. Black arrows represent cross-lagged paths (i.e., the paths of interest); grey paths represent control paths. Model fit: CFI = .93 and RMSEA = .06. Effects for age, sex and number of friends are also controlled for, but not presented for reasons of clarity. Also for clarity reasons, only the standardized betas for the cross-lagged paths are displayed. In Appendix A.1, Table A.6 presents the standardized betas for the control paths, stability paths and within-time associations of this model.

In sum, we found a reciprocal relationship between a group's emotional experience and an individual member's emotional experience (Hypothesis 1). In addition, we found that the emotions that other people perceive to be desirable and appropriate in the group affected both the group's and individual members' emotional experience (Hypothesis 2a); but also, the emotional experience of the group and of its individual members changed the group's ideas about the desirability and appropriateness of experiencing these emotions within the group (Hypothesis 2b).

2.4. Discussion

In the current study, we were interested in the emergence of shared emotions among group members, and in the role of emotion norms in this process. Our study provides evidence that there is a reciprocal relationship between a group's emotional experience and an individual member's emotional experience, such that group members' emotional experiences become gradually (more) aligned across time. Moreover, emotion norms seem to play a role in this process of emotional convergence. The results showed that the emotion norms present in the group guide group members' emotional experience, but also that group members' emotional experience in turn affects the emotion norms they see fit within their group. Thus, there is a bidirectional link between emotion norms and emotional experience in task groups over time. These results are true both for anger and gratitude, emotions which are presumed to be important regulators of social interactions.

In order to investigate the relationship between emotion norms and emotional experience both at the group and the individual level, we first

established this link at the individual level. We found not only that people do conform to the emotion norms they perceive within their group, but they also change these norms in accordance with their own emotional experience. This suggests that, at least in the context of small, interactive task groups, individual members' emotion norms are not stable, but may vary as a function of group members' individual emotional experiences.

Our results are in line with studies in other fields that demonstrate positive associations between emotion norms and emotional experience (e.g., Eid & Diener, 2001; Hochschild, 1983; Holodynski & Friedlmeier, 2006). However, with our longitudinal design, we show the direction of the link: Emotion norms affect emotional experience, but the reverse is true as well. Although there is a correlation between individual members' emotion norms and their emotional experience at any point in time (*r*s =.42 to.48 for anger; *r*s =.35 to.48 for gratitude), this correlation does not account for the relationships across different points in time. When looking at the effects over time, we controlled for within-time associations: Thus, the relationship between emotion norms and emotional experience over time is variance explained over and above within-time associations.

More central to our hypotheses are the findings that there is a bidirectional link between the group's emotion norms and both the group's emotional experience and individual members' emotional experience, as well as between the group's emotional experience and individual members' emotional experience. Based on earlier theorizing on the link between emotion norms and emotional experience in group contexts, we expected a reciprocal influence between emotion norms and emotional experience (e.g., Barsade & Gibson, 1998; Kelly & Barsade, 2001).

Barsade and her colleagues (Barsade & Gibson, 1998; Kelly & Barsade, 2001) proposed a model showing a dynamic interplay between a group's emotions and the emotion norms that are formed within the group. Group members negotiate guidelines for appropriate behavior based on their own past and current emotional experiences and expectations. These guidelines regulate group members' emotional experiences, but may also be altered when the group's emotions change. Our results confirmed that there is indeed a dynamic interplay between a group's emotion norms and a group's emotional experience. In addition, we also found a dynamic interplay between a group's emotion norms and individual members' emotional experience, suggesting that not only do individual group members adjust their emotional experience to the group's norms, but also that individual group members' experience can alter the group's norms.

The finding that the group's emotional experience and individual members' emotional experience dynamically shape each other resonates with previous research showing that group members' emotions are congruent (e.g., George, 1990; Totterdell et al., 1998; Totterdell, 2000), and extends it. Whereas previous research yielded similarity of emotional experience between the members of an established group, we showed that members of a new group affect each other's emotions over time, suggesting that group members' emotional experience becomes gradually more aligned through mutual influence between group members. Moreover, the increase of the intraclass correlations for both anger and gratitude, as the groups continue to collaborate, suggests emotional convergence over time.

Our findings relate to both anger and gratitude. These emotions were selected because they function as important regulators of social interactions, and they may serve this function in task groups as well. When group members enter a group, they may expect that all group members strive towards the common goal of optimal task completion and that everyone is motivated to contribute. Since anger is often perceived as a dysfunctional emotion (e.g., Averill, 1982), a norm to downplay anger may guide group members' experience, at least initially. Conversely, gratitude benefits collaboration, and therefore, there may be an initial norm to feel grateful towards the other group members. Indeed, the perceived appropriateness and desirability of experiencing anger in week 2 is low (M = 1.74), whereas the perceived appropriateness and desirability of experiencing gratitude is high (M = 3.85).

As the group evolves, a dynamic interplay between the emotion norms and emotional experience develops as well. It is conceivable that being angry becomes more acceptable either because the anger of some group members justifies the anger of all others, or because group members believe that anger is needed to improve group performance. Relaxed norms with regard to anger will in turn afford more anger experience and expression, which will itself signal a greater acceptance of anger. Consistently, anger became more accepted over time (M = 1.74 in week 2, M = 2.10 in week 13) and anger experiences became more intense (M = 1.72 in week 2, M = 2.50 in week 13), as evidenced by the gradual increase of the respective mean values over time.

When group members perceive a norm for high gratefulness, they will adjust their level of gratitude accordingly. Similarly, observing others' gratitude will not only remind an individual that this is a desirable and appropriate emotion, but also highlight what there is to be grateful for:

other group members' contributions. Our results for anger and gratitude may generalize to other emotions insofar as these emotions are perceived as being important for the group.

Limitations and Future Directions

There are some limitations to this study. In the current study, we followed 68 task groups of second year psychology students. Future studies should examine whether the results generalize to groups in other contexts. First, the groups we have studied are very homogeneous, consisting of mainly female psychology students aged 20 years. It may well be that in more heterogeneous groups it takes more time both to achieve consensus around emotion norms and to reach emotional congruence. Under some circumstances, groups may not reach agreement on their emotion norms or on their emotional experience; this may be the case when the group splits up in subgroups, or was diverse to begin with. In fact, failing to reach emotional congruence may be one of the reasons why diverse groups sometimes have poor outcomes.

Second, we followed student groups from the very start of their collaboration, which is when we expect a group to be formed. It is in this first stage of group formation that the norms are likely negotiated in the course of interactions. Therefore, we expect that the positive feedback loop between emotional experience and emotion norms is mainly to be found in these newly formed groups. It is conceivable that emotion norms are crystallized in groups with a longer history. Hence, the feedback loop may not be as strong in existing groups, though we expect emotion norms and emotional experience still to be related.

Third, we treated every group member as equally important, but it may well be that some group members are more influential than others. Group leaders may be a case in point, such that their emotion norms and their emotional experiences have a relatively high impact on the other members. For instance, the group leader's emotion may be taken for the norm, and when a group leader openly disapproves of another group member's emotion, this may signal a norm to not have the emotion.

Conclusion

This study showed that members of small interactive task groups mutually influence each other's anger and gratitude experience, in ways that produce emotional alignment among group members. We found a positive feedback loop between group norms on the one hand, and both a group's and individual members' experiences of anger and gratitude on the other hand. Together, these findings suggest that both emotion norms and emotional experience are emergent group processes that dynamically shape each other over time. Interventions that target either the norms or the emotional experience of group members may thus be expected to affect group outcomes.

Emotions Are Not Always Contagious: Longitudinal Spreading of Self-Pride and Group Pride in Homogeneous and Status-Differentiated Groups



This chapter is based on: Delvaux, E., Meeussen, L., & Mesquita, B. (2015). Emotions are not always contagious: Longitudinal spreading of self-pride and group pride in homogeneous and status-differentiated groups. *Cognition and Emotion.* Advance online publication. doi:10.1080/02699931.2015.1018143

3.1. Introduction

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 et al., 2007; Totterdell, 2000; Totterdell et al., 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 et al., 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 act is contagious" (p. 10). Based on evidence from dyads, 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 Kleef, 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 out-group 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 et al., 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 characterized the spread of emotions in crowds as an automatic and unavoidable process (LeBon, 1896). More specifically, we hypothesize 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 et al., 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 &

[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).

Polanco, 2009; Tracy & Robins, 2007b). Pride motivates sustained effort (Pekrun et al., 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 hypothesized 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 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 behaviors of high-status partners than the reverse (Hall et al., 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 & A. Rafaeli, 2008). Moreover, low-status partners of dyads rely more on high-status members when taking decisions (e.g., Oldmeadow et al., 2003) and converge more towards the emotions of the high-status partner than vice versa (Anderson et al., 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.

3.2. 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 3.1). Table 3.1 summarizes 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.

[2] In Appendix A.2, Table A.7 displays the intercorrelations between individual member' and the group's self-pride and group pride across different time points.

Table 3.1 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			
Self-pride	3.12 (0.64)	3.17 (0.71)	3.37 (0.72)	3.47 (0.67)
	0.85	0.87	0.90	0.81
Group pride	3.45 (0.76)	3.52 (0.81)	3.52 (0.94)	3.53 (1.00)
	0.87	0.87	0.91	0.93
Within-time correlation	0.45***	0.52***	0.41***	0.34***

Note. $^{***}p < .001$. For two-item scales, Spearman-Brown coefficients are preferred over Cronbach's alpha to assess scales' reliability (Eisinga et al., 2013).

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 3.1 illustrates the general model tested. The cross-lagged paths of the model tested our main hypotheses (paths d and e in Figure 3.1). In estimating these cross-lagged effects, we controlled for within-time correlations and autoregressive paths (paths a, b and c in Figure 3.1).

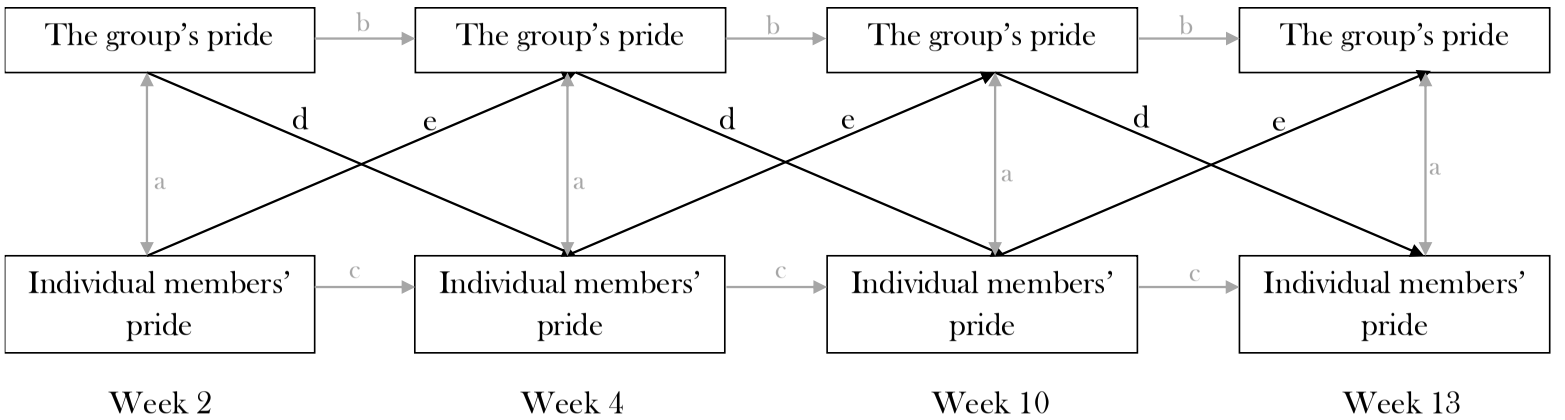

Figure 3.1 This figure illustrates the interplay between individual members' pride and the group's pride across time. Paths *a* refer to within-time correlations. Paths *b* and *c* are autoregressive or stability paths. Paths *d* and *e* are cross-lagged paths; these paths are central our hypotheses. Age-, gender- and number of friends-effects are also controlled for, but not presented for reasons of clarity.

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 3.1). The model confirmed our hypothesis (Figure 3.2): 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.

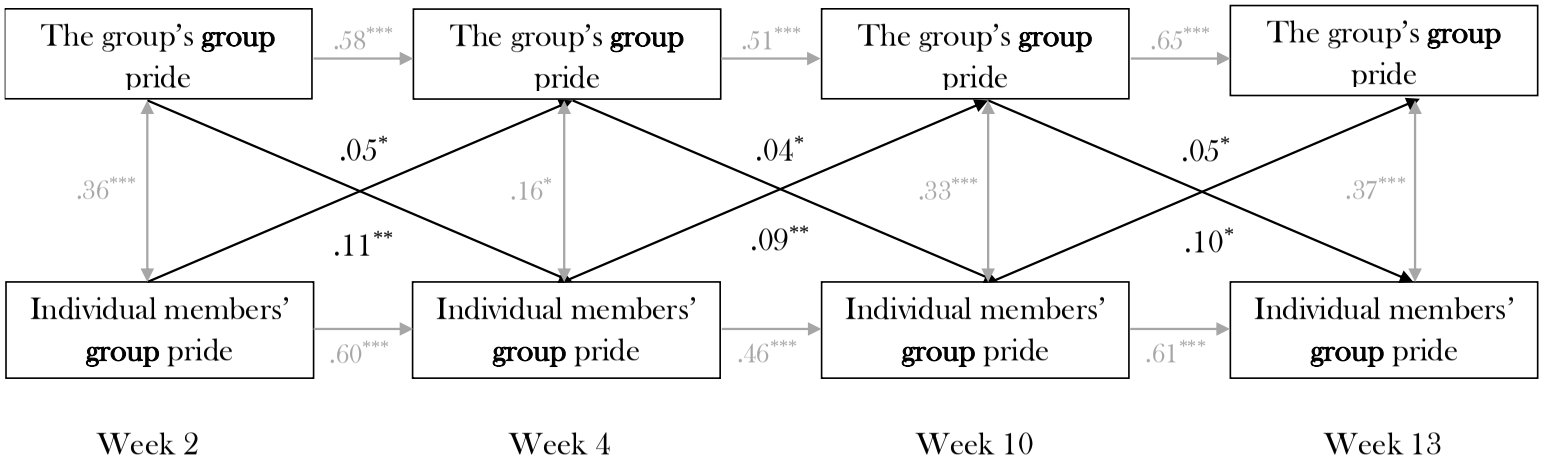

Figure 3.2 Cross-lagged paths between the group's group pride and an individual member's group pride. The numbers in the figure represent the standardized betas across time. Full arrows represent significant paths. The model fit is good: CFI = .95, RMSEA = .07. The model was fully replicated with and without different covariates (i.e., number of friends at the start, age and gender).

Note. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Moreover, intraclass correlations (ICCs; Kenny et al., 1998) at all times were significant for group pride (see Table 3.2), 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.

Table 3.2 Significance tests for intraclass correlations and variance at the group level for feelings of pride (Study 1)

	Week 2	**Week 4**	**Week 10**	**Week 13**
Self-pride	$\rho = 0.08$	$\rho = 0.01$	$\rho = 0.03$	$\rho = 0$
	$\chi^2(1) = 3.42$	$\chi^2(1) = 0.05$	$\chi^2(1) = 0.45$	$\chi^2(1) = 0$
	$p = .06$	$p = .82$	$p = .50$	$p \approx 1$
Group pride	$\rho = 0.24$	$\rho = 0.15$	$\rho = 0.26$	$\rho = 0.38$
	$\chi^2(1) = 22.33$	$\chi^2(1) = 8.47$	$\chi^2(1) = 18.56$	$\chi^2(1) = 36.51$
	$p<.001$	$p = .003$	$p<.001$	$p<.001$

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 3.1). Consistent with our hypothesis, individual members' self-pride and the group's self-pride did not mutually influence each other over time (Figure 3.3). 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 3.2). We conclude that self-pride was not shared among group members.

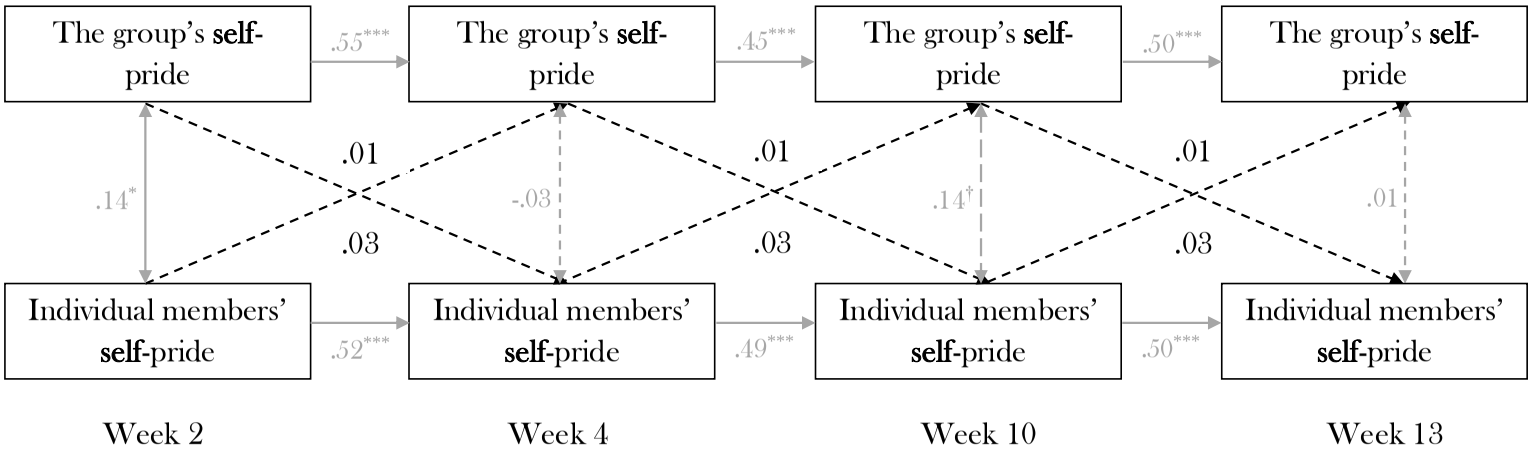

Figure 3.3 Cross-lagged paths between the group's self-pride and an individual member's self-pride. The numbers in the figure represent the standardized betas across time. Dotted arrows represent non-significant paths. The model fit is just below threshold for the CFI-value (.88), but acceptable for the RMSEA-value (.09). The model was fully replicated with and without different covariates (i.e., number of friends at the start, age and gender).

Note. $^{\dagger}p < .10$, $^{*}p < .05$, $^{***}p < .001$.

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.

3.3. 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).

Combining these two study aims, we hypothesized 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., pedaling 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]

[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

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 3.3 summarizes the means, standard deviations and within-time correlations of self-pride and group pride.[4]

Table 3.3 Means, standard deviations, reliabilities and within-time correlations for self-pride and group pride (Study 2)

	Week 7	Week 21	Week 24
Self-pride	3.33 (0.81)	3.47 (0.81)	3.77 (0.78)
Group pride	3.40 (0.75)	3.57 (0.92)	3.90 (0.86)
Within-time correlation	0.44***	0.37***	0.36***

Note. *** $p < .001$.

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 dichotomized 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] In Appendix A.2, Table A.8 displays the intercorrelations between individual member' and the group's self-pride and group pride across different time points.

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)]. Dichotomizing the influence ratings was necessary in order to use them in the longitudinal social network analysis program, 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 (outdegree 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 et al., 2013; Snijders et al., 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 (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 3.4 summarizes 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 3.4, 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 3.4, parameter 1); these status effects were not found for self-pride (Table 3.4, 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 3.5).

[5] The complete models that we tested can be found in Table A.9 (descriptions of the effects) and Table A.10 (statistics of the effects) of Appendix A.2.

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 3.4, parameter 2) and (2) group members also tend to agree among themselves on who is influential within their group (Table 3.4, parameter 3). Therefore, the group appears to agree on a small number of high-status members.

Second, the influence network as well as the feelings of both self-pride and group pride are dynamic across time (Table 3.4, 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 3.4, 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 3.4, parameter 9).

Table 3.4 Estimations and standard errors tested in the network model for self-pride and group pride (Study 2)

Nr.	Effect	Self-pride	Group pride
Effect of interest:			
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)
Controls:			
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). $^{\dagger}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Table 3.5 Significance tests for intraclass correlations and variance at the group level for feelings of pride (Study 2)

	Week 7	Week 21	Week 25
Self-pride	$\rho = 0.03$	$\rho = 0.09$	$\rho = 0.05$
	$\chi^2(1) = 0.42$	$\chi^2(1) = 2.87$	$\chi^2(1) = 0.71$
	$p = .52$	$p = .09$	$p = .40$
Group pride	$\rho = 0.15$	$\rho = 0.23$	$\rho = 0.16$
	$\chi^2(1) = 7.39$	$\chi^2(1) = 16.20$	$\chi^2(1) = 9.71$
	$p = .007$	$p < .001$	$p = .001$

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 Ti) were less satisfied with the group's achievements (at Ti+1) than the group members with less status (scale means for high-status members: $M_{W7–W21} = 3.55$ and $M_{W21–W24} = 3.89$; scale means for low-status members: $M_{W7–W21} = 3.78$ and $M_{W21–W24} = 3.99$; $F(1, 171) = 5.07$, $p = .03$ between week 7 and 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 et al., 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 (β = .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.

3.4. 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" (T. 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 theorizing 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 stabilization. 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 et al., 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 et al., 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 & A. 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.

Emotions Are Not Always Contagious: The Case of Gratitude



In the second study of Chapter 3, my co-authors and I demonstrated that group pride spreads in groups via high-status group members. In the same study, we investigated whether this finding can be replicated for gratitude. Like group pride, gratitude can be considered relevant to all group members. But unlike group pride that focuses on a group's achievements (e.g., Williams & DeSteno, 2009; Zander et al., 1972), gratitude has a relational focus, and is implicated in relationship building and maintenance (e.g., Algoe et al., 2010; Algoe et al., 2008). In an earlier chapter, we showed that groups converge with respect to gratitude (cf. Chapter 2). In this extension of Chapter 3, we show the role that high-status group members play in the convergence of gratitude.

To examine the spread of gratitude via high-status group members, we used the same methods as in Chapter 3 (pp. 90-92), but this time we focused on gratitude rather than group pride. Group members' gratitude towards their fellow group members was measured by using the same scale as in Chapter 2 (Spearman-Brown correlations ranging from 0.66-0.80, see Chapter 2). Reliabilities of this scale were low in the current research, especially at the first time point (see Table 3bis.1). Table 3bis.1 provides an overview of the means, standard deviations and reliabilities for gratitude at the different time points.

Table 3bis.1 Means, standard deviations and reliabilities for gratitude at the different time points

Week 7	Week 21	Week 24
Mean (SD)		
Spearman-Brown coefficient		
3.34 (0.68)	3.39 (0.72)	3.53 (0.77)
0.41	0.63	0.63

Note. We used Spearman-Brown coefficients instead of Cronbach's alphas to measure the reliability of the scale for excitement and gratitude, because this coefficient is better for two-item scales (Eisinga et al., 2013). Reliability of group gratitude was acceptable in Week 21 and week 24, but low in Week 7.

A summary of the most central results can be found in Table 3bis.2[1]. It is important to note that both the influence networks and gratitude intensity showed variance over time, rendering the study of gratitude changes through influence ties meaningful (Table 3bis.2, parameters 2-5). Furthermore, the results support the existence of influence hierarchies in groups (Magee & Galinsky, 2008): Influence was granted to only a few group members (Table 3bis.2, parameter 6), and there was agreement on which members were influential (Table 3bis.2, parameter 7). Consistent with our hypothesis, we found that, over time, the intensity of group members' gratitude changed in the direction of the levels of gratitude reported by members perceived to be influential (Table 3bis.2, parameter 1).

[1] The complete model that we tested can be found in Table A.11 of Appendix A.2.

Table 3bis.2 Estimations and standard errors tested in the network model for gratitude

Nr.	Effect	Gratitude
Effect of interest:		
1	Does the gratitude of a group member who is perceived as influential by another group member, predicts the gratitude of that other group member?	0.52 (0.26)*
Controls:		
2	Is there a change in influence ties between week 7 and week 21?	4.41 (0.48)***
3	Is there a change in influence ties between week 21 and week 24?	3.09 (0.30)***
4	Is there a change in the gratitude levels between week 7 and week 21?	1.60 (0.28)***
5	Is there a change in the gratitude levels between week 21 and week 24?	1.73 (0.27)***
6	Do group members form many ties with other group members?	-2.38 (0.63)***
7	Do group members agree on who is influential within their group?	1.06 (0.14)***

Note. The numbers in the table represent estimates and their standard errors (between brackets). A t-ratio is obtained by dividing the parameter estimate by its standard error. $^{\dagger}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

In addition, the intra-class correlations (ICCs) that estimate the level of similarity between group members (e.g., Kenny et al., 1998), showed convergence of group members' gratitude towards the end of the project (Table 3bis.3). In conclusion, we replicated the finding with group pride: Gratitude spreads through high-status group members. This replication confirms the notion that emotions that bear relevance to the group converge.

Table 3bis.3 ICCs and significance tests for variance at the group level for gratitude

	Gratitude
Week 7	$\rho = .09$, $\chi^2(1) = 3.07$, $p = .08$
Week 21	$\rho = .07$, $\chi^2(1) = 1.95$, $p = .16$
Week 24	$\rho = .13$, $\chi^2(1) = 6.50$, $p = .01$

Specific Group Emotions Predict Specific Group Outcomes: A Functional Emotion Approach



This chapter is based on: Delvaux, E., Van Dijk, H., & Mesquita, B. (2015). *Specific group emotions predict specific group outcomes: A functional emotion approach*. Manuscript in preparation.

4.1. Introduction

The emotions of different group members have been found to be more similar than can be expected based on chance, or than the emotions of the general population. Hence, many researchers have aggregated individual group members' emotions to form a group-level emotion. These group-level emotions are linked with important group outcomes, which is another indication that it is meaningful to aggregate individual emotions to a group average.

In laboratory settings, positive emotions at the group level have been related to reduced group conflict and increased cooperation, to the willingness to engage in extra-role behaviors, and to better task performance (Barsade, 2002; Tanghe et al., 2010). Moreover, field studies have yielded links between positive group emotions and group efficacy in teams of nurses (C. B. Gibson, 2003), between positive group emotions and subjective performance in cricket teams and service teams (Tanghe et al., 2010; Totterdell, 2000), and between positive group emotions and low rates of absenteeism in sales teams (George, 1990). In contrast, field studies have yielded links between negative group emotions and reduced prosocial behavior towards customers in sales teams (George, 1990), and between negative group emotions and low performance in service teams and in teams of a multinational (Cole, Walter, & Bruch, 2008; Tanghe et al., 2010). Together, these studies show that emotional valence is an important predictor of group outcomes (see also Knight & Eisenkraft, 2015).

Following a recommendation in a literature review on group affect (Barsade & D. E. Gibson, 2012), the current research goes beyond emotional valence to investigate the associations between specific group

emotions and group outcomes. To our knowledge, only one study before this one has investigated how specific group emotions are linked to group outcomes. This study focused on group-level envy, and showed its (indirect) association both with lower levels of group satisfaction and group performance, and higher rates of absenteeism (Duffy & Shaw, 2000). Although this research focused on a specific emotion, namely group-level envy, it is not clear whether group-level envy is uniquely linked with the proposed outcomes, because its effects are not compared to the effects of other emotions. In the current research, we compare the unique contribution of two positive group emotions (pride and gratitude) on specific group outcomes.

We start from the notion that emotions are appraisals of an (emotional) situation, that go beyond the valence of the situation, but also represent assessments on other dimensions of meaning (e.g., novelty, predictability, goal significance and coping potential; Ellsworth & Scherer, 2003; C. A. Smith & Ellsworth, 1985). Specific emotions correspond to distinct profiles of appraisal on these different dimensions of meaning, and give direction to action (Frijda, 1986, 2007; Lazarus, 1991). For instance, anger is a negative emotional experience, for which another person is held responsible, and is associated with a motivation to get your way (Frijda et al., 1989; Kuppens et al., 2003; Van Kleef et al., 2004; see also Tiedens, 2001). Given that specific emotions are constituted of distinct appraisal patterns and action tendencies, they may provide more insights into the link between specific group emotions and specific group outcomes, insights that cannot be captured by focusing on valence alone (cf. appraisal-tendency framework; Lerner & Keltner, 2000).

Research on individual emotions and intergroup emotions has already demonstrated the value of focusing on specific emotions rather

than on studying general mood or affect. For instance, in a study on decision making, two different negative emotions were associated with distinct action tendencies: angry participants made risk-seeking choices, whereas fearful participants made risk-aversive choices (Lerner & Keltner, 2001). Similarly, research on intergroup emotions has shown that intergroup anger is associated with a tendency to approach out-group members, whereas intergroup fear is associated with a tendency to avoid out-group members (Mackie et al., 2000; H. J. Smith et al., 2008). Although both anger and fear are negative emotions, anger entails appraisals of certainty and personal control, whereas fear entails appraisasl of uncertainty and situational control, explaining the tendency to take risky decisions or to approach when feeling angry, and the tendency to take safe decisions or to withdraw when feeling afraid.

Different positive emotions are also related to distinct action tendencies: group-based pride, a disengaging emotion that draws boundaries between groups and increases the distance between in- and out-groups (Kitayama et al., 2006), is positively associated with in-group favoritism, whereas group-based sympathy, an engaging emotion that strengthens the bond between in- and out-groups (Kitayama et al., 2006), is negatively associated with in-group favoritism (Harth et al., 2008).

Extant research has thus established the viability of the appraisal-tendency framework (Lerner & Keltner, 2000, 2001). Applying this framework to group contexts, we propose that specific group emotions predict specific group outcomes. As such, we take a functional approach to emotions in the context of small groups (cf. Keltner & Haidt, 1999).

Group Emotions Under Study

Most of the research on the link between group emotions and group outcomes has focused on positive emotions (Elfenbein, 2014), presumably because these are the most conducive to optimal group functioning. In addition, the effects are often less complex for positive as compared to negative emotions. For instance, in a recent meta-analysis on the link between group affect and group outcomes, Knight and Eisenkraft (2015) found that positive group emotions are usually related to positive outcomes. Conversely, they found that the link between negative group emotions and group outcomes was less unequivocal: negative group emotions facilitated group performance and social integration when it was targeted at an external source or when it was experienced in a 1-shot group, but inhibited group performance and social integration when the source was internal or when negative affect was experienced in an ongoing group. Given that the effects of negative affect on group outcomes are more complex (cf. Knight & Eisenkraft, 2015), and that more is known about the effects of positive emotions (Elfenbein, 2014), we decided to focus on positive emotions in the current research.

We selected positive emotions that differ with respect to how group members evaluate the situation within the group. More specifically, we selected (self- and group) pride as emotions that focus on task aspects within groups, and gratitude as an emotion that focuses on relational aspects within groups. Pride is an emotion that is experienced upon the successful completion of an important goal (Williams & DeSteno, 2009). It entails an attribution of personal control and responsibility for the desired goal (Tong, 2015; Weiner, 1986). Pride motivates sustained effort towards current and future goals (Pekrun et al., 2009; Williams & DeSteno, 2009). In group contexts, group members may feel proud of

their own contribution to the task, but they may similarly feel proud of the group's progress towards or successes on the group's tasks; they then attribute the success to the group as a whole (Zander et al., 1972).

Gratitude is an emotion that is experienced when someone else's actions bring about a desired outcome (Tong, 2015). Feelings of gratitude are often accompanied with a willingness to repay the benefactor (Algoe et al., 2008). As such, gratitude feelings are conducive to relationship building and maintenance, in newly formed and longer existing relationships alike (Algoe et al., 2013; Algoe et al., 2010; Bartlett et al., 2012). Since gratitude plays a central role in relationship building in dyads, we expect that it will do the same for relationships among the members of task groups.

Given that pride and gratitude provide different assessments of a group's situation, we expect them to predict different aspects of group functioning. More specifically, we expected that group pride, a task-focused emotion, would be the strongest predictor of a group's task outcomes, whereas gratitude, a relationship-focused emotion, would be the strongest predictor of a group's relational outcomes. We expected that group pride rather than self-pride would predict a group's task outcomes, because feelings of self-pride do not reflect on a group's functioning (cf. Delvaux, Meeussen, & Mesquita, 2015a).

Group Outcomes Under Study

Just as we selected emotions with either a task or relational focus, we also selected group outcomes with either a task or a relational focus. More specifically, we selected two task outcomes, namely collective efficacy and (subjective) group performance, and two relational outcomes, namely group liking and relational conflict. Collective efficacy refers to group

members' collective belief that they are able to perform well on the group's tasks (C. B. Gibson, 1999, 2003). Group performance reflects on the actual performance of a task group, and is one of the most studied task outcomes in group research. In the current research, we were not able to obtain an objective measure of group performance. Therefore, we focused on subjective rather than on objective group performance. Group liking and relational conflict are both indicators of the quality of interpersonal relationships in groups. Group liking is about whether other group members are regarded as friends or not, whereas relational conflict describes whether there are (relational) frictions among group members (Jehn, 1995).

The Current Research

In order to examine the link between specific group emotions and specific group outcomes, we conducted a four-wave longitudinal study following task groups during their collaboration on a project. We investigate how, over time, self-pride, group pride and gratitude predict task and relational outcomes. More specifically, we hypothesize that a) group pride, a task-focused emotion, will be a stronger predictor of task outcomes (i.e., collective efficacy and subjective group performance) than self-pride or gratitude, and that b) gratitude, a relationship-focused emotion, will be a stronger predictor of relational outcomes (i.e., group liking and relational conflict) than self-pride or group pride. We expect that self-pride will not be a (strong) predictor of task or relational outcomes, because this type of emotion does not reflect on a group's functioning.

4.2. Method

Participants

We followed 68 task groups with members working on an assignment over the course of 13 weeks. The groups consisted of four to six second-year psychology students (N_{total} = 295), and there were on average five members per group (M = 4.93, SD = 0.31). Participants completed questionnaires at four different times throughout their collaboration. All participants who filled out the questionnaire at least once were included in the study. When participants filled out the questionnaire at all four times, they received 10 euro; when they filled out the questionnaire less than four times, they received 3 euro. Participants were on average 20.39 years old (SD = 1.20). The majority of them were female (88.2%), which reflected the composition of the population of psychology students.

Procedure

Participants were second-year psychology students who collaborated on a group project, that was part of the sophomore methods course for psychology majors. For the group project, the task group members collaborated to design, run and report on two psychological studies. Participants completed questionnaires at four different moments during their collaboration; these moments coincided with important junctures of the group project. Questionnaires were filled out a) in Week 2, after task group members performed a literature review, b) in Week 4, after they formulated research questions based on their literature review, c) in Week 10, after they analyzed the data they collected in the context of their research project, and d) in Week 13, after they turned in their final research report. Participants were motivated to perform well on the group

project: the methods course is an important part in students' curriculum. In addition, collaboration between task group members was reinforced, since 90% of students' final grades depended on the group's performance; the remaining 10% was based on students' personal contribution.

Measures

Since we were interested in how group-level emotions predict group-level outcomes, all the variables were aggregated to the group level.

Self-pride

Self-pride was measured by asking participants to what extent they felt proud of themselves while collaborating with the other members of their group, since the last measurement. We used two Dutch synonyms to measure self-pride ("trots op mezelf" and "fier op mezelf"). At each time point, participants rated their level of self-pride on a 5-point Likert scale ranging from 1 = *Very weakly* to 5 = *Very strongly*. The reliability of the scale was very good at each time point (lowest reliability = 0.85 in Week 2; see also Table 4.1).

Group pride

Group pride was measured by asking participants to what extent they felt proud of their group while collaborating with the other members of their group, since the last measurement. We used two Dutch synonyms to measure group pride ("trots op de groep" and "fier op de groep"). At each time point, participants rated their level of group pride on a 5-point Likert scale ranging from 1 = *Very weakly* to 5 = *Very strongly*. The reliability of the scale was very good at each time point (lowest reliability = 0.87 in Weeks 2 and 4; see also Table 4.1).

Gratitude

Gratitude was measured by asking participants to what extent they felt grateful towards the other group members while collaborating with them, since the last measurement. Gratitude was measured with two items, namely "grateful towards the other group members" and "appreciative of the other group members". At each time point, participants rated their level of gratitude on a 5-point Likert scale ranging from 1 = *Very weakly* to 5 = *Very strongly*. The reliability of the scale was somewhat low in Week 2 (0.66), but acceptable at the other time points (see also Table 4.1).

Collective efficacy

Collective efficacy was measured with three items, based on the self-efficacy scale from Pintrich and De Groot (1990). We reframed the items to capture collective efficacy and adapted them to the specific task group context. More specifically, the items were: "As compared to other groups, I expect that we have performed well", "As compared to other groups, I believe that we are a competent group", and "As compared to other groups, this group has the right skills to bring the group project to a good end". At each time point, participants rated their collective efficacy beliefs on a 5-point Likert scale ranging from 1 = *Totally disagree* to 5 = *Totally agree*. The reliability of the scale was very good at each time point (lowest reliability = 0.88; see also Table 4.1).

Subjective group performance

Subjective group performance was measured with three items ("How do you evaluate the quality of your group's work?", "How satisfied are you with your group's work?" and "Which grade do you expect to receive on this project?"). At each time point, participants rated the perceived quality

of the project and their satisfaction with the project on a 5-point Likert scale ranging from 1 = *Not good/satisfied at all* to 5 = *Very good/satisfied*. Participants rated their expected grade with a number from 0 to 20; we recoded the expected grade to a 5-point scale in order to compose a composite scale for self-reported group performance, in which all indicators have equal weight. The reliability of the scale was somewhat low in Week 2 (0.65), but acceptable at the other time points (see also Table 4.1).

Group liking

Group liking was measured with two of the items of the Liking-scale of Jehn (1995), adapted to the specific task group context: "I generally like the other members of my group" and "The other people in my group are my friends". At each time point, participants rated their level of group liking on a 5-point Likert scale ranging from 1 = *Totally disagree* to 5 = *Totally agree*. The reliability of the scale was good at each time point (lowest reliability = 0.73 in Week 2; see also Table 4.1).

Relational conflict

Relational conflict was measured with three items of the Intragroup Conflict-scale by Jehn (1995): "How much friction is there among members in your group?", "How much are personality conflicts evident in your group?" and "How much emotional conflict is there among members in your group?". At each time point, participants rated the level of relational conflict they perceived in their group on a 5-point Likert scale ranging from 1 = *Totally disagree* to 5 = *Totally agree*. The reliability of the scale was good at each time point (lowest reliability = 0.78 in Week 4; see also Table 4.1).

Table 4.1 provides an overview of the means, standard deviations and reliabilities of the different variables at the different time points. Since we were interested in how group-level emotions predict group-level outcomes, Table 4.1 depicts the group-level means and standard deviations.

Table 4.1 Means, standard deviations and reliabilities for the different variables at the different time points

	Week 2	Week 4	Week 10	Week 13
	M (SD)			
	Reliability[1]			
Self-pride	3.12 (0.34)	3.17 (0.35)	3.36 (0.40)	3.45 (0.38)
	0.85	0.87	0.90	0.81
Group pride	3.43 (0.49)	3.50 (0.48)	3.48 (0.67)	3.47 (0.77)
	0.87	0.87	0.91	0.93
Gratitude	3.42 (0.39)	3.41 (0.43)	3.44 (0.52)	3.47 (0.59)
	0.66	0.70	0.80	0.78
Collective efficacy	3.68 (0.39)	3.65 (0.38)	3.62 (0.51)	3.50 (0.59)
	0.91	0.88	0.89	0.90
Subjective group	3.48 (0.32)	3.35 (0.35)	3.41 (0.45)	3.49 (0.45)
performance	0.65	0.72	0.78	0.79
Group liking	3.69 (0.64)	3.69 (0.61)	3.69 (0.62)	3.59 (0.71)
	0.73	0.75	0.77	0.78
Relational conflict	1.52 (0.36)	1.63 (0.37)	1.94 (0.52)	2.05 (0.66)
	0.78	0.78	0.82	0.83

[1] The reliabilities were calculated with Cronbach's alphas for scales consisting of three items (i.e., Collective efficacy, Subjective performance & Relational conflict); the reliabilities of two-item scales (i.e., Self-pride, Group pride, Gratitude & Group liking) were measured with Spearman-Brown correlations, which are preferred over Cronbach's alphas for two-item scales (Eisinga et al., 2013).

Analyses

To test the hypothesis that group emotions predict group outcomes, we performed regression analyses with all variables situated at the group level. We first tested the effect of each emotion on each outcome variable separately. We then entered all three emotions into the model at once, in order to test the unique contribution of each emotion while controlling for the other variables. By controlling for shared variance, we went beyond the link between positive valence and positive outcomes to examine how each emotion separately predicted specific group outcomes. We predicted group-level outcomes at one point in time from group-level emotions at the previous time point: our analyses were thus time-lagged. Given the longitudinal nature of our analyses, we specified two-level random intercept models, with time at the lowest level and groups at the highest level (Hox, 2002).

4.3. Results

Relationship Between Group Emotions and Task Outcomes

To test our hypothesis that group pride would be the strongest predictor of task outcomes, we predicted collective efficacy and subjective group performance at one time point from feelings of self-pride, group pride and gratitude at the previous time point; all variables were situated at the group level. With regard to collective efficacy, we found that, when the emotions were tested separately, each of them significantly predicted collective efficacy. More specifically, higher levels of self-pride (β = .31, SE = .08, p < .001), group pride (β = .37, SE = .06, p < .001) and gratitude (β = .33, SE = .07, p < .001) were significantly associated with higher levels of collective efficacy. Although all emotions significantly predicted collective

efficacy, the effect of group pride had the highest t-value, suggesting that group pride is the strongest predictor of collective efficacy. Indeed, when the emotions were entered into one model, testing the effect of one emotion, while simultaneously controlling for the other emotions, we found that only the effect of group pride remained significant. More specifically, higher levels of group pride (β = .29, *SE* = .08, p = .001) were significantly associated with higher levels of collective efficacy; this was not the case for self-pride (β = .11, *SE* = .09, p = .22) and gratitude (β = .06, *SE* = .10, p = .51). Table 4.2 summarizes the results for emotions predicting collective efficacy.

Table 4.2 Self-pride, group pride and gratitude as predictors of collective efficacy

	Emotions separately	Emotions together
Self-pride	β = .31, *SE* = .08	β = .11, *SE* = .09
	t(190.53) = 3.80, p < .001	t(195.85) = 1.23, p = .22
Group pride	β = .37, *SE* = .06	β = .29, *SE* = .08
	t(200.82) = 6.59, p < .001	t(193.46) = 3.47, p = .001
Gratitude	β = .33, *SE* = .07	β = .06, *SE* = .10
	t(201.12) = 4.50, p < .001	t(201.00) = 0.66, p = .51

With regard to subjective group performance, we found that, when the emotions were tested separately, each of them again significantly predicted subjective group performance. More specifically, higher levels of self-pride (β = .23, *SE* = .08, p = .002), group pride (β = .26, *SE* = .05, p < .001) and gratitude (β = .23, *SE* = .07, p < .001) were associated with higher levels of subjective group performance. Although all emotions

significantly predicted subjective group performance, the effect of group pride had the highest t-value, suggesting that group pride is the strongest predictor of subjective group performance. Indeed, when the emotions were entered into one model, testing the effect of one emotion, while simultaneously controlling for the other emotions, we found that only the effect of group pride remained significant. More specifically, higher levels of group pride (β = .21, SE = .08, p = .009) were significantly associated with higher levels of subjective group performance; this was not the case for self-pride (β = .10, SE = .09, p = .26) and gratitude (β = .04, SE = .09, p = .65). Table 4.3 summarizes the results for emotions predicting subjective group performance.

Table 4.3 Self-pride, group pride and gratitude as predictors of subjective group performance

	Emotions separately	Emotions together
Self-pride	β = .23, SE = .08	β = .10, SE = .09
	t(202.27) = 3.08, p = .002	t(203.62) = 1.14, p = .26
Group pride	β = .26, SE = .05	β = .21, SE = .08
	t(187.05) = 5.14, p < .001	t(202.65) = 2.62, p = .009
Gratitude	β = .23, SE = .07	β = .04, SE = .09
	t(201.12) = 3.51, p < .001	t(203.77) = 0.45, p = .65

In sum, in line with our hypothesis that group pride, a task-focused emotion, would be the strongest predictor of task outcomes, we found that, whereas all emotions predicted task outcomes when entered separately into a model, only group pride explained unique variance over and above the effects of self-pride and gratitude when all emotions were

entered simultaneously into a model. Thus, over time, group pride is the strongest predictor of both collective efficacy and subjective group performance.

Relationship Between Group Emotions and Relational Outcomes

To test our hypothesis that gratitude would be the strongest predictor of relational outcomes, we predicted group liking and relational conflict at one time point from the feelings of self-pride, group pride and gratitude at the previous time point; all variables were situated at the group level. With regard to group liking, we found that, when the emotions were tested separately, both group pride and gratitude significantly predicted group liking; the effect of self-pride on group liking was marginally significant. More specifically, higher levels of self-pride (β = .15, SE = .08, p = .07), group pride (β = .25, SE = .06, p < .001) and gratitude (β = .39, SE = .07, p < .001) were (marginally) significantly associated with higher levels of group liking. Although all emotions were (marginally) significant predictors of group liking, the effect of gratitude had the highest t-value, suggesting that gratitude is the strongest predictor of group liking. Indeed, when the emotions were entered into one model, testing the effect of one emotion, while simultaneously controlling for the other emotions, we found that only the effect of gratitude remained significant. More specifically, higher levels of gratitude (β = .33, SE = .09, p = .001) were significantly associated with higher levels of group liking; this was not the case for self-pride (β = -.01, SE = .09, p = .93) and group pride (β = .09, SE = .08, p = .28). Table 4.4 summarizes the results for emotions predicting group liking.

Table 4.4 Self-pride, group pride and gratitude as predictors of group liking

	Emotions separately	Emotions together
Self-pride	β = .15, *SE* = .08	β = -.01, *SE* = .09
	t(160.59) = 1.85, p = .067	t(156.48) = -0.09, p = .93
Group pride	β = .25, *SE* = .06	β = .29, *SE* = .08
	t(176.52) = 4.33, p < .001	t(155.65) = 1.08, p = .28
Gratitude	β = .39, *SE* = .07	β = .39, *SE* = .09
	t(182.02) = 5.49, p < .001	t(163.46) = 3.49, p = .001

With regard to relational conflict, we found that, when the emotions were tested separately, both group pride and gratitude significantly predicted relational conflict; the effect of self-pride on relational conflict was not significant. More specifically, higher levels of group pride (β = -.27, *SE* = .07, p < .001) and gratitude (β = -.40, *SE* = .08, p < .001) were significantly associated with lower levels of relational conflict; self-pride and relational conflict were not significantly associated (β = -.10, *SE* = .10, p = .32). Although both group pride and gratitude were significant predictors of relational conflict, the effect of gratitude had the strongest t-value, suggesting that gratitude is the strongest predictor of relational conflict. Indeed, when the emotions were entered into one model, testing the effect of one emotion, while simultaneously controlling for the other emotions, we found that only the effect of gratitude remained significant. More specifically, higher levels of gratitude (β = -.31, *SE* = .12, p = .009) were significantly associated with lower levels of relational conflict; this was not the case for self-pride (β = .13, *SE* = .11, p = .24) and group pride (β

= -.15, *SE* = .10, *p* = .13). Table 4.5 summarizes the results for emotions predicting relational conflict.

Table 4.5 Self-pride, group pride and gratitude as predictors of relational conflict

	Emotions separately	Emotions together
Self-pride	β = -.10, *SE* = .10	β = .13, *SE* = .11
	t(194.82) = -0.99, *p* = .32	*t*(194.25) = 1.19, *p* = .24
Group pride	β = -.27, *SE* = .07	β = -.15, *SE* = .10
	t(203.96) = -4.01, *p* < .001	*t*(192.18) = -1.53, *p* = .13
Gratitude	β = -.40, *SE* = .08	β = -.31, *SE* = .12
	t(199.11) = -4.78, *p* < .001	*t*(199.49) = -2.65, *p* = .009

In sum, in line with our hypothesis that gratitude, a relationship-focused emotion, would be the strongest predictor of relational outcomes, we found that, whereas both group pride and gratitude predicted relational outcomes when entered separately into a model, only gratitude explained unique variance over and above the effects of self-pride and group pride when all emotions were entered simultaneously into a model. Thus, over time, gratitude is the strongest predictor of both group liking and relational conflict.

4.4. Discussion

The aim of the current research was to demonstrate that specific group emotions bring about specific group outcomes. Guided by the appraisal-tendency framework (Lerner & Keltner, 2000, 2001) and applying this framework to emotions in task groups, we hypothesized that group pride,

a task-focused emotion, would be the strongest predictor of task outcomes, whereas gratitude, a relationship-focused emotion, would be the strongest predictor of relational outcomes. To test our hypotheses, we conducted a longitudinal study in which we followed members of 68 real-life, interactive task groups, who were working on a joint project, at four different times throughout their collaboration (that lasted for 13 weeks). The use of a longitudinal design is a strength of the study, as it allows for testing effects over time. In addition, the use of real-life task groups enhanced the ecological validity of our research, since we followed task groups as they naturally unfolded over time.

The results of our research showed that, when the emotions were entered into separate models, self-pride, group pride and gratitude predicted task outcomes, and group pride and gratitude predicted relational outcomes. These results are in line with what would be predicted from a valence-based approach: positive group emotions predict positive group outcomes. However, when the emotions were tested simultaneously, we found that specific emotions predict specific outcomes, a finding which is in line with the appraisal-tendency framework (Lerner & Keltner, 2000, 2001). More specifically, higher levels of group pride predicted higher levels of collective efficacy and subjective group performance, over and above the effects of self-pride and gratitude, which were not significant anymore. Similarly, higher levels of gratitude predicted higher levels of group liking and lower levels of relational conflict, over and above the effects of self-pride and group pride, which were not significant anymore. Thus, emotions with a task focus uniquely contributed to the prediction of task, but not relational outcomes, and emotions with a relational focus uniquely contributed to the prediction of relational, but not task outcomes.

With regard to self-pride, we found that it was related to task outcomes when it was the only predictor, but that it was not related to any of the outcomes when it was tested together with the other emotions. That self-pride predicted task outcomes when it was the only predictor, may be because of the shared task focus of self-pride and task outcomes. Self-pride did not predict relational outcomes, even when it was the only predictor (except for its marginal effect on group liking). This may be because self-pride not only lacked a relational focus, but it also did not reflect on a group's functioning.

Our research extends the existing evidence on the link between group emotions and group outcomes. Whereas the existing evidence has provided useful insights into this link, and thus on group processes and group functioning, our findings demonstrate that not only emotional valence matters to the prediction of group outcomes. Rather, we found that specific emotions with their constellation of appraisals patterns and action tendencies predict different aspects of group functioning. In the current research, we focused on how different positive emotions predict different aspects of group functioning. Future research should also investigate whether specific negative emotions bring about specific (negative, but maybe also positive) outcomes. This may however require an elaborated theoretical framework given that the effects of negative emotions tend to be less straightforward than the effects of positive emotions (Elfenbein, 2014; Knight & Eisenkraft, 2015).

In sum, the current research extends the research on the link between group emotions and group outcomes by applying insights from appraisal theories of emotions to the context of small groups. In line with the idea that specific emotions bring about specific outcomes, we hypothesized and found that emotions with a task focus more readily

predicted task outcomes, whereas emotions with a relational focus more readily predicted relational outcomes. Thus, this study demonstrates that there is more than valence alone to group emotions, and that it is useful to distinguish between different emotions in order to gain a deeper insight into the psychology of groups and their functioning.

The Power of the Unusual: The Role of Divergent Emotions on Emerging Group Emotions



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5.1. Introduction

When group members spend time together, their emotional experiences tend to converge (e.g., Barsade, 2002; Bartel & Saavedra, 2000; Delvaux, Meeussen, & Mesquita, 2015a; Delvaux, Vanbeselaere, & Mesquita, 2015; George, 1990; Ilies et al., 2007; Sy et al., 2005; Tanghe et al., 2010; Totterdell, 2000; Totterdell et al., 1998) – a finding that suggests that group members influence each other's emotions such that they become similar and shared. Yet, what exactly this process of emotional convergence looks like is unknown.

One possibility is that all group members evenly contribute to emotional convergence, and thus find some middle ground between their emotions. This view best approximates the assumption of most current research on group emotions, which is that group members contribute equally to the aggregate emotions of the group (in fact measured by taking the mean of all group members' emotions). By this account, there is no real reason that any one group member's emotions would be more influential than another's.

An alternative view is that some group members' emotions influence the emerging group emotions more than those of others. In other words, the process of emotional convergence is uneven, and the emerging group emotion is closer to some members' emotions than those of others. The current research investigated one reason that individual emotions may be more influential: the degree to which they are different from the prototypical group emotion.

There are several reasons that the most divergent emotions may particularly influence the emotions of other group members. First, emotions that diverge from the prototypical group emotion are more

visible to other group members: They catch the attention of group members. Second, divergent emotions provide a unique perspective on the situation. This perspective may inform the other members' own perspective on the situation, and thus influence their emotions into the direction of the most divergent emotions. In terms of the Emotions as Social Information-framework (EASI-framework; Van Kleef, 2009; Van Kleef et al., 2010), divergent emotions provide especially salient information, and interaction partners use each other's emotions to make inferences about the situation at hand (e.g., Parkinson et al., 2012; Sorce et al., 1985).

In the current research, we will investigate whether emotions that diverge from the prototypical group emotion (i.e., the *most intense* and *least intense* emotions within a group) are predictive of other members' emotions. To this aim, we conducted one cross-sectional study and one longitudinal study. Both studies focused on real-life, interactive task groups: the first study involved teams of employees in an organization; the second study followed work groups of students collaborating on a joint project.

Divergent Emotions as Predictors of Emerging Group Emotions

Most previous research –including our own– solely focused on how individual group members' emotions are linked to the group's average or mean intensity of that emotion (e.g., Delvaux, Meeussen, & Mesquita, 2015a; Delvaux, Vanbeselaere, & Mesquita, 2015; Ilies et al., 2007; Totterdell, 2000; Totterdell et al., 1998). The mean intensity is informative to others because it reflects on how a prototypical group member would feel. In the context of task groups, we propose that one way in which the emotions of one group member may be informative to

the other group members is when they diverge from the prototypical group emotion. As such, the *most intense* emotions within a group may inform other group members about the group's functioning. Take for instance very intense anger: When one group member gets very angry because a few group members are slowing down the process, other team members may suddenly notice those team members' role in the lack of progress, and this may increase their own anger feelings. Similarly, the *least intense* emotions within a group may be informative to others within the group. For instance, when one group member is experiencing low levels of group pride, this may signal that the group is not performing all that well; when other members take this cue, and make the same inference, they may start experiencing lower levels of group pride as well.

I am not the first to hypothesize the influence of group members with extreme emotions. Several organizational behavior researchers have speculated about the possibility that group members are influenced by the most intense and least intense emotions within their group (Barsade & D. E. Gibson, 1998; Kelly & Barsade, 2001). Work on 'emotion spirals' has similarly proposed that the emotions of one very positive or one very negative group member may spread to others (Felps et al., 2006; Walter & Bruch, 2008). Moreover, the theory on affective integration has suggested that individual characteristics become integrated into group characteristics when they are salient to the group (Moreland et al., 1996); the least prototypical emotions within a group such as the most or the least intense may be the most salient to other group members.

Research in other domains than emotion also points into the direction of influence by more "extreme" group members. For instance, research on the influence of minorities in decision making has demonstrated that dissenters, who consistently disagree with other group

members, change other group members' opinion into the direction of their opinion (for a review, see Maass & R. D. Clark, 1984). Likewise, the emotions of members at the extreme ends of the intensity distribution (i.e., the "dissenters") may change the emotions of other group members. Furthermore, research on group composition variables of personality studied how maximum and minimum level personality traits in a group predict group functioning in terms of group performance and group cohesion (Barrick, Stewart, Neubert, & Mount, 1998; Bell, 2007; Halfhill, Nielsen, Sundstrom, & Weilbaecher, 2005; Halfhill, Sundstrom, Lahner, Calderone, & Nielsen, 2005); the results of this research suggest that the behavior of one group member possessing the highest or lowest personality trait within their group can affect the whole group's functioning.

Despite ample theorizing on the role of intense emotions (or other intense traits), there is very little research on this topic. The role of intense emotions can be inferred from a study on emotional contagion in groups (Barsade, 2002), in which the emotions of a trained confederate were especially influential in shaping the group's emotions. The likely reason is that the confederate's (instructed) emotion was more intense than the naturally occurring emotions in his group. Intensity expression can be assumed to have played a role in studies on emotional contagion, in which the emotions of expressive individuals were more likely to influence the emotions of others than those of inexpressive individuals (Friedman, & Riggio, 1981; Hatfield et al., 1994). Though several studies indirectly support the idea that high intensity (expressions of) emotions are particularly influential, research directly testing the idea is lacking. The current research fills this gap. We propose that group members with the

most intense or least intense emotion within their group impact group functioning.

The Current Research

The current research focuses on the influence of the least prototypical emotions on the emotions of other group members. Prototypicality is measured with respect to intensity of emotional experience: We expected that individuals experiencing the most and least intense emotions of a group would impact the emotions of the other group members more than would individuals experiencing emotions at levels that were less extreme by the group's standards. We test this hypothesis against the backdrop of the influence of the prototypical emotion of a group, which we also expect to shape the emotions of other group members. To cover a broad range of emotions, we selected four emotions that varied with respect to (a) valence and (b) task versus relationship orientation. The emotions were group pride (positive and task-oriented), group shame (negative and task-oriented), group gratitude (positive and relationship-oriented) and group anger (negative and relationship-oriented). In two studies, a cross-sectional and a longitudinal study, we tested whether affective extremity and prototypicality of emotional intensity respectively predicted individual members' emotions.

5.2. Study 1

Method

Participants

Seven-hundred eighty-nine employees of a large, semi-governmental Belgian organization took part in this study. The employees belonged to

85 different teams, each consisting of 4 to 33 members (M = 9.28, SD = 4.91). Sixty-two percent of the participants were male (n = 491), 36% of the participants were female (n = 282), two percent of the participants failed to indicate gender (n = 16). On average, participants were 43.5 years old. They had been working for the organization for an average of 18 years (SD = 11.67), and they had been part of their current team for an average of 9.8 years (SD = 8.88). Since the organization employed both French- and Dutch-speaking Belgians, the questionnaires were administered in French and Dutch respectively[1]. Participants chose the language of preference: 46 % of the participants filled out the French version of the questionnaire (n = 362), 54% of the participants the Dutch version (n = 427)[2].

Procedure

The current study was part of a larger research project studying 'Diversity at the workplace'. We started with the selection of potential teams after the director confirmed the organization's participation. Out of a list of all available teams, we selected those teams with a maximum of 25 employees[3], because we assumed that employees would interact frequently in these teams. Our first selection consisted of 122 teams. We recruited the 122 potential teams by contacting each team leader by

[1] A bilingual translator translated and back-translated the questionnaire from Dutch into French.

[2] We omitted one participant from the analyses because we suspected that he did not fill out the questionnaire properly: (a) he reported to be asleep at work the whole time, (b) although he only worked in the organization for six months and reported that he had no colleagues, he claimed to have the lead over 80 employees, and (c) he only used the extreme ends of the scales in the questionnaire.

[3] Although we only selected teams with 25 employees or less, our final sample had two teams with more than 25 employees, because these team had grown since the team list was made.

phone. Fifteen percent of the team leaders could not be reached (n = 18), and two percent did not wish to participate (n = 2). We received completed questionnaires from 83% of the remaining teams (n = 85).

During the recruitment by phone, the team leaders informed the researchers on the number of French and Dutch questionnaires needed. When the team leaders received the questionnaires, they distributed these among all members of their team. Employees were allowed to complete the questionnaire during working hours; filling out the questionnaire took approximately 30 minutes. After employees had filled out the questionnaire, they returned them in a sealed envelope to their team leader. When the team leader received the envelopes from all team members, he or she mailed them back to the researchers in pre-printed envelopes.

Measures

Individual-level emotions. Employees' emotions in the context of their group were measured with the following statement: "During last month, when I worked together with the other members of my group, I felt [emotion]". Group shame, group anger and group gratitude were each measured with two items; all scales were reliable (lowest reliability for gratitude (0.68); see also Table 5.1). Group pride was only measured with one item, because the French language does not have synonyms for pride. Employees rated the intensity of their emotions on a 5-point Likert scale ranging from 1 = *Very weak* to 5 = *Very strong*.

Group-level emotions. We measured prototypical and divergent emotions of a group as indicators of group-level emotions. The group median captured the prototypical level of emotional experience; the group's maximum and minimum level of emotional experience was taken

as an indication of the extremes of each emotion. We used the group median as an indicator of the prototypical emotion of a group rather than the previously used group mean (e.g., Delvaux, Meeusen, & Mesquita, 2015a; Delvaux, Vanbeselaere, & Mesquita, 2015; Ilies et al., 2007; Totterdell, 2000; Totterdell et al., 1998), because the group median has less conceptual and empirical overlap with the group's maximum and minimum than the group mean. Table 5.1 depicts the means, standard deviations and reliabilities of the individual-level and group-level emotion measures.

Table 5.1 Means, standard deviations and reliabilities for the emotion measures

	Group pride	Group shame	Group gratitude	Group anger
	M (SD)			
	Spearman-Brown coefficient			
Individual-level	3.19 (0.88)	1.90 (0.93)	3.42 (0.74)	2.21 (0.97)
	/	0.76	0.68	0.75
Group median	3.17 (0.43)	1.69 (0.57)	3.40 (0.38)	2.21 (0.58)
Group maximum	4.27 (0.54)	3.28 (0.89)	4.33 (0.47)	3.65 (0.75)
Group minimum	1.98 (0.72)	1.04 (0.14)	2.38 (0.59)	1.19 (0.38)

Note. For two-item scales, Spearman-Brown coefficients are preferred over Cronbach's alphas to measure scale reliabilities (Eisinga et al., 2013).

Analyses

We used a stepwise approach to test whether the three group-level emotion characteristics predicted individual members' emotions. First, we tested the effects of each characteristic of the group-level emotion

separately. Next, we tested for each characteristic whether it explained variance in individual members' emotions, over and above the effect of the other group-level emotion characteristics. Finally, we tested whether each of the three group-level emotion characteristics predicted individual members' emotions after excluding group members with median, maximum, and minimum levels of emotion, respectively. We did this to overcome the problem of common variance between the independent (group-level emotion) and dependent variable (individual-level emotion). In our analyses, we took the nestedness of our data (members are nested within groups) into account by specifying two-level random intercept models (Hox, 2002). We controlled for gender, age, group tenure, leadership, language and group size.

Results & Discussion

As expected, the three group-level emotion characteristics each predicted individual members' emotions (see Table 5.2). More specifically, the group median predicted individual members' emotions for pride, shame, gratitude and anger alike. In addition, individual members' emotions were predicted by the highest as well as the lowest intensity emotion in the group across all four emotions. Therefore, both the prototypical group emotion as well as the divergent emotions were associated with individual members' emotions.

When controlling for the other group-level emotion characteristics, both the median and maximum level emotion in the group still affected individual members' emotions, as predicted. For all but one emotion, the minimum level emotion of the group also predicted the emotions of the individual group members (see Table 5.2). The exception was shame, where the minimum level of shame in the group did no longer predict

individual members' emotions, after controlling for the median and maximum level of shame.

Finally, even after excluding group members with the median, minimum, and maximum level emotion in their group, these group-level emotion characteristics predicted the emotions of the other group members in all but two cases (see Table 5.2). First, the effect of the median group level of pride on individual members' pride became marginally significant, after excluding group members who experienced median levels of pride from the data. Second, the effect of the minimum group level of shame on individual members' experience of shame became non-significant, after excluding group members who experienced the minimum level of pride from the data.

Altogether, the results of this first study are in line with our predictions. First, and in line with previous research, we found that the group median (i.e., the prototypical emotion within a group) predicted individual members' emotions. Second, and more central to our hypothesis was the finding that the most intense (i.e., the group maximum) as well as the least intense (i.e., the group minimum) emotions within a group also predicted individual members' emotions. The most and least intense emotions within a group are the ones that attract other members' attention as they stand out. Since the most and least intense emotions are more visible to other members, these other members may use them as information on how the group is doing, and adjust their own emotions accordingly. Most of the effects hold when simultaneously controlling for the other group-level emotion characteristics, suggesting that the different group-level emotion characteristics are uniquely associated with individual members' emotions.

Table 5.2 Group-level emotions predict individual members' emotions

	Group pride	Group shame	Group gratitude	Group anger
	B (SE)			
	p-value			
	Predictors separately entered			
Group median	0.629 (.076)	0.552 (.059)	0.698 (.072)	0.732 (.064)
	$p < .001$	$p < .001$	$p < .001$	$p < .001$
Group maximum	0.370 (.061)	0.314 (.043)	0.451 (.059)	0.392 (.054)
	$p < .001$	$p < .001$	$p < .001$	$p < .001$
Group minimum	0.287 (.044)	1.074 (.279)	0.345 (.045)	0.753 (.126)
	$p < .001$	$p < .001$	$p < .001$	$p < .001$
	Predictors simultaneously entered			
Group median	0.432 (.084)	0.435 (.063)	0.411 (.091)	0.560 (.083)
	$p < .001$	$p < .001$	$p < .001$	$p < .001$
Group maximum	0.200 (.062)	0.202 (.044)	0.213 (.069)	0.136 (.056)
	$p = .001$	$p < .001$	$p < .001$	$p = .015$
Group minimum	0.191 (.045)	0.387 (.252)	0.230 (.046)	0.289 (.120)
	$p < .001$	$p = .124$	$p < .001$	$p = .016$
	Without respective group-level emotion in dependent variable			
Group median	0.279 (.144)	0.197 (.088)	0.561 (.109)	0.615 (.088)
	$p = .053$	$p = .025$	$p < .001$	$p < .001$
Group maximum	0.574 (.063)	0.287 (.043)	0.508 (.071)	0.379 (.051)
	$p < .001$	$p < .001$	$p < .001$	$p < .001$
Group minimum	0.355 (.047)	0.256 (.251)	0.337 (.046)	0.646 (.130)
	$p < .001$	$p = .309$	$p < .001$	$p < .001$

A major limitation of the first study is its cross-sectional nature. A more stringent test of our hypothesis that extreme emotion levels within a group influence the emotions of individual group members would be provided by longitudinal research. In Study 2 we followed the emotions of group members over time, allowing us to model the effects of group-level emotion characteristics on individual-level emotions over time.

5.3. Study 2

Method

Participants

Two-hundred ninety-five second-year psychology students took part in the study. They belonged to 68 work groups consisting of four to six group members each (M = 4.93, SD = 0.31). These work groups were formed as part of a sophomore methods course for psychology majors. For this course, students collaborated in small groups over a period of thirteen weeks to conduct a research cycle. At four different times during their collaboration, students filled out an online questionnaire. The participation rate was high: 83% of the students participated in all four waves; the participation rate ranged from 98% in the first wave to 88% in the last wave. On average, participants were 20.39 years old (SD = 1.20). Reflecting the student body, 85% of the participants were female (n = 250) and 12% of the participants were male (n = 34); 4% of the participants did not indicate their gender (n = 11). Participants received 10€ after filling out all questionnaires, and 3€ if they completed less than four questionnaires.

Procedure

Participants were recruited during the first session of a sophomore methods course for psychology majors. During this course, students were trained to do research. More specifically, students performed a whole research cycle over a period of 13 weeks. At four different time points, which coincided with important junctures in the course, students filled out an online questionnaire. The first wave was collected after two weeks in the project. By then, students did a literature study on the topic of sustainability. The second wave was collected in week 4 of the project, after students had formulated research hypotheses. We collected the third wave in week 10, after students had conducted their research and analyzed their data. Finally, the last wave was collected in week 13, after students had handed in their final research report.

Since the course constituted a major part of the students' curriculum (10% of their yearly grade depended on this course), students were motivated to work hard on the project. On average, they reported working 4.36 hours a week on the project (SD = 2.37); about one third of this time, they worked together with all group members (M = 1.45, SD = 1.25). Moreover, students were motivated to collaborate well, since 90% of their final grade depended on the end product of the whole group.

Measures

Individual-level emotions. Students' emotions in the context of their work group were measured with the following statement: "Since last measurement, how strongly did you experience [emotion] when you were working together with the other members of your group?" Group pride, group shame, group anger, and group gratitude were each measured with

two items; at the different time points, the reliabilities for all scales were satisfactory (the lowest reliability was for gratitude in Week 2 (0.66); see also Table 5.3). Students rated the intensity of their emotions on a 5-point Likert scale ranging from 1 = *Very weak* to 5 = *Very strong*.

Group-level emotions. As group-level emotion characteristics, we again selected the group median, group maximum and group minimum of the different emotions. Table 5.3 depicts the means, standard deviations and reliabilities of the individual-level emotions and of the group-level emotion characteristics at the different waves.

Analyses

To test whether the group-level emotion characteristics predicted individual members' emotions, we used the same stepwise approach as in Study 1, taking into account the nestedness of the data (Hox, 2002). In this study, time points were nested within participants, and participants were nested within work groups. Our analyses were time-lagged, such that individual members' emotions at one time were predicted from the affective group characteristics at the previous time point. In this study, we controlled for age, gender and number of friends at the start of the project[4].

[4] We also controlled for number of friends at the start of the project, because this variable may have an effect on the emotions that are experienced and thus on the emotional processes taking place in groups.

Table 5.3 Means, standard deviations and reliabilities for the emotion measures

	Group pride	Group shame	Group gratitude	Group anger
	M (SD)			
	Spearman-Brown coefficient			
	Week 2			
Individual-level	3.45 (0.76)	1.51 (0.71)	3.44 (0.71)	1.72 (0.80)
	0.87	0.87	0.66	0.76
Group median	3.49 (0.51)	1.40 (0.51)	3.48 (0.41)	1.61 (0.59)
Group maximum	4.04 (0.57)	2.23 (0.80)	4.07 (0.46)	2.53 (0.81)
Group minimum	2.73 (0.73)	1.02 (0.13)	2.68 (0.63)	1.10 (0.25)
	Week 4			
Individual-level	3.52 (0.81)	1.50 (0.70)	3.42 (0.70)	1.88 (0.87)
	0.87	0.92	0.70	0.80
Group median	3.59 (0.53)	1.36 (0.47)	3.44 (0.52)	1.77 (0.70)
Group maximum	4.15 (0.53)	2.26 (0.78)	4.02 (0.50)	2.79 (0.79)
Group minimum	2.68 (0.73)	1.07 (0.25)	2.74 (0.59)	1.21 (0.42)
	Week 10			
Individual-level	3.52 (0.94)	1.65 (0.86)	3.47 (0.79)	2.37 (1.08)
	0.91	0.93	0.80	0.86
Group median	3.50 (0.70)	1.57 (0.65)	3.51 (0.53)	2.28 (0.78)
Group maximum	4.21 (0.75)	2.48 (1.00)	4.10 (0.59)	3.35 (1.03)
Group minimum	2.68 (0.85)	1.11 (0.37)	2.69 (0.72)	1.56 (0.67)
	Week 13			
Individual-level	3.53 (1.00)	1.66 (0.90)	3.52 (0.83)	2.50 (1.12)
	0.92	0.93	0.78	0.86
Group median	3.45 (0.81)	1.50 (0.69)	3.49 (0.66)	2.47 (0.92)
Group maximum	4.20 (0.87)	2.49 (0.99)	4.15 (0.64)	3.44 (0.97)
Group minimum	2.77 (0.95)	1.16 (0.45)	2.78 (0.78)	1.79 (0.90)

Note. For two-item scales, Spearman-Brown coefficients are preferred over Cronbach's alphas to measure scale reliabilities (Eisinga et al., 2013).

Results & Discussion

We first tested the effects of the group-level emotion characteristics at one point in time on individual members' emotions at the next time point. As predicted, the three group-level emotion characteristics predicted individual members' feelings over time (see Table 5.4). More specifically, the group median at one point in time predicted individual members' emotions at the next time point for pride, shame, gratitude and anger alike. In addition, the group maximum also predicted individual members' emotions across the four emotions. Finally, the group minimum predicted individual members' emotions, for pride, gratitude and anger, but not for shame. This may be due to the limited variance of this variable (ranging from 0.02 to 0.20).

Next, when testing the effects of all group-level emotion characteristics simultaneously, the effects remained the same for gratitude only. For pride, the effect of the group maximum became marginally significant. For shame, not only the effect of the group minimum, but also the effect of the group median became non-significant. For anger, the effect of the group minimum became non-significant.

Finally, even after excluding group members with the median, minimum, and maximum levels of emotion in their group, these group-level emotion characteristics predicted the emotions of the other group members in all but two cases. For shame, only the effect of the group maximum remained significant; the effect of the group minimum and the group median were non-significant, after excluding group members who experienced minimum respectively median levels of shame from the data.

Table 5.4 Group-level emotions predict individual members' emotions

	Group pride	Group shame	Group gratitude	Group anger
	B (SE)			
	p-value			
	Predictors separately entered			
Group median	0.399 (.056)	0.182 (.053)	0.317 (.060)	0.423 (.057)
	$p < .001$	$p < .001$	$p < .001$	$p < .001$
Group maximum	0.255 (.057)	0.145 (.032)	0.237 (.058)	0.234 (.044)
	$p < .001$	$p < .001$	$p < .001$	$p < .001$
Group minimum	0.185 (.041)	0.144 (.106)	0.131 (.041)	0.300 (.083)
	$p < .001$	$p = .174$	$p = .001$	$p < .001$
	Predictors simultaneously entered			
Group median	0.296 (.078)	0.108 (.067)	0.214 (.077)	0.296 (.078)
	$p < .001$	$p = .108$	$p = .006$	$p < .001$
Group maximum	0.115 (.068)	0.120 (.037)	0.175 (.067)	0.142 (.051)
	$p = .091$	$p = .001$	$p = .009$	$p = .006$
Group minimum	0.103 (.047)	0.006 (.119)	0.122 (.043)	0.132 (.094)
	$p = .029$	$p = .960$	$p = .005$	$p = .162$
	Without respective group-level emotion variable in dependent variable			
Group median	0.418 (.072)	0.092 (.084)	0.329 (.076)	0.581 (.068)
	$p < .001$	$p = .272$	$p < .001$	$p < .001$
Group maximum	0.429 (.069)	0.185 (.044)	0.364 (.074)	0.264 (.058)
	$p < .001$	$p < .001$	$p < .001$	$p < .001$
Group minimum	0.284 (.054)	0.061 (.190)	0.274 (.052)	0.344 (.106)
	$p < .001$	$p = .749$	$p < .001$	$p = .001$

Thus, consistent with Study 1, we found that different group-level emotion characteristics predicted how individual members felt within their group. In addition, we tested these effects in a time-lagged design, showing that the group-level emotion characteristics at one point in time predicted how individual members felt at the next time point. Thus, the group median, the group maximum and the group minimum shape the emotions of individual group members over time.

Most of the effects remained when the group-level emotion characteristics were entered simultaneously into the model or when they were excluded from the dependent variable; however, some of them became non-significant. For the negative emotions shame and anger, the group minimum was the least stable predictor of the three group-level emotion characteristics. In addition, for shame, the group median was not a consistent predictor of individual members' shame experience. For pride, the group maximum was the least stable predictor of individual members' pride experience. For gratitude, all affective group composition variables predicted how grateful individual members felt.

Together, the results of this study replicate the findings of the first study that different group-level emotion characteristics predict individual members' emotions, but in a longitudinal setting. Different from Study 1, the results of this study suggest that for positive emotions (at least for group pride), the group minimum is a stronger predictor of individual members' emotions than the group maximum, whereas for negative emotions (for both group shame and group anger), the group maximum is a stronger predictor of individual members' emotions than the group minimum. This may be due to the lower variance in the group minimum for negative emotions and the group maximum for positive emotions (see Table 5.3).

Alternatively, this may be because the group maximum of negative emotions and the group minimum of positive emotions have a stronger signaling function than the group minimum of negative emotions or the group maximum of positive emotions. In groups, the default is to have positive emotional experiences, because this signals that the group is doing well. Therefore, high positive or low negative emotions may not capture group members' attention that much because these emotions signal the status quo. However, when a group member diverges from the default (i.e., when they experience low positive or high negative emotions), these emotions may signal that the group is not doing well and that action is needed (cf. Schwarz & Clore, 1983). Given that high negative or low positive emotions may convey stronger messages than low negative or high positive emotions, they may be picked up more easily by other group members, causing group members to change their appraisals and emotions accordingly.

The findings are consistent with research on personality showing that the group minimum was a stronger predictor of group outcomes than the group maximum when the personality traits were positively valenced (e.g., agreeableness, extraversion, emotional stability; Barrick et al., 1998; Bell, 2007; Halfhill, Nielsen et al., 2005; Halfhill, Sundstrom et al., 2005). In addition, they are also in line with research showing that negative information is stronger than positive information, and thus has a stronger impact on people's behavior (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Peeters & Czapinski, 1990; Rozin & Royzman, 2001; Schwarz & Clore, 1983).

5.4. General Discussion

In the current research, we tested the idea that some group members exert stronger influence over the emotions of their fellow group members than other group members. More specifically, we proposed that group members who displayed the least prototypical emotions within their group would influence the emotions of other members more than group members who were closer to the prototypical emotion, and whose emotions thus showed less divergence from the group. To test this idea, we predicted individual members' emotions from the most intense (i.e., group maximum) as well as the least intense (i.e., group minimum) emotions within their group. In addition, we also included the group median, which reflects the prototypical group emotion (i.e., the middle position within the group), in order to test whether each of these group-level emotion characteristics (i.e., group maximum, group minimum and group median) predicts individual members' emotions, over and above the effect of the other group-level emotion characteristics, and as such, uniquely contributes to individual members' emotions.

We tested whether different group-level emotion characteristics contributed to individual members' emotions with two studies: one cross-sectional study with teams of an organization, and one longitudinal study with work groups that were followed at four times during their collaboration on a joint project. In line with our expectations, we found that the three group-level emotion characteristics (i.e., group maximum, group minimum and group median) generally predicted individual members' emotions, both cross-sectionally (Study 1) and across different time points (Study 2). Furthermore, the three group-level emotion characteristics explained variance in individual members' emotions, even

when controlling for the other group-level emotion characteristics. Thus, to know how an individual group member feels can be partly derived from how a prototypical member feels and partly from how the members with the most or least intense emotions feel.

Although it was previously suggested that different group-level emotion characteristics may play a role in explaining how group members feel (e.g., Barsade & D. E. Gibson, 1998; Kelly & Barsade, 2001), most of the existing research focused on the role of the group mean only (e.g., Delvaux, Meeussen, & Mesquita, 2015a; Delvaux, Vanbeselaere, & Mesquita, 2015; Ilies et al., 2007; Totterdell, 2000; Totterdell et al., 1998). Our research aimed to fill this gap by testing the effect of different group-level emotion characteristics (simultaneously) in one study.

We proposed that the emotions of the least prototypical group members would affect the emotions of others because of their salience to the group. Both the most and the least intense emotions within a group are the most visible to other members, and hence attract most attention. In addition, the most and the least intense emotions within a group also provide a unique perspective on the situation. As such, other members may use these emotions to inform their own perspective on the situation, and adjust their emotions accordingly (cf. Van Kleef, 2009; Van Kleef et al., 2010). Thus, given that emotions have been conceived of messages, strong emotions may contain a strong message, and hence may be especially useful to inform other members' perspective and emotions.

Although both the most and the least intense emotions predicted individual members' emotions, especially in Study 2, we found differences in the strength of the associations, depending on the valence of the emotion. More specifically, we found stronger associations between group-level emotion characteristics and individual members' emotions for

the most intense negative and the least intense positive emotions. This finding may also be considered in light of the EASI-framework (Van Kleef, 2009; Van Kleef et al., 2010). The most intense negative emotions and the least intense positive emotions may be most salient to group members, because they diverge the most from the "default" positive emotional experience; therefore, they may have an even stronger signaling function in groups. These findings are also consistent with other research showing that negative information has stronger effects on people's thoughts, feelings and actions than positive information (Baumeister et al., 2001; Peeters & Czapinski, 1990; Rozin & Royzman, 2001; Schwarz & Clore, 1983).

Limitations and Future Directions

Although we have found that the most intense and the least intense emotions within a group inform other members' emotions, we don't know how this process evolves. We have suggested that group members use the emotions of other members to inform their own perspective, and adjust their emotions accordingly (cf. convergent affective linkage; Elfenbein, 2014). It is likely that this process would take place for feelings of pride and shame about the group. However, for anger and gratitude, other processes may bring about convergence around an emerging group emotions as well. For instance, it may be that one group member's anger informs the other group members about the bad standing of the group, and hence other group members may come to share his anger by taking the same perspective, as was the case in the anger example of the introduction. However, it may also be that other group members do not agree with the angry group member, and show reactive anger instead. In this case, it is the angry group member himself who is the trigger of the

emotional reactions of fellow group members (cf. complementary affective linkage; Elfenbein, 2014). Future research may focus on members' appraisals to disentangle different processes of emotional convergence.

The current research provides first empirical evidence on how different group-level emotion characteristics shape group members' emotional experience. Future research may focus on investigating the scope of our findings: For example, do affective group composition variables predict group members' emotions also longitudinally in longer existing groups? Do affective group composition variables predict group members' emotions when other emotions being studied? Are there also other conditions than valence under which the most or least intense emotions have stronger influence? For instance, are the most or least intense emotions especially predictive of other members' emotions when they are displayed by high-status group members or group leaders? Finally, it may be also interesting to investigate both the direct and indirect effects of different group-level emotion characteristics on group outcomes such as group performance and group cohesion.

Implications and Practical Recommendations

Whether group-level emotion characteristics bring about shared emotions by generating a shared vantage point, or by inducing reactive emotions, the current research contributes to our knowledge on how the emotions of individual group members are shaped by showing that different group-level emotion characteristics predict individual members' emotions. Knowing more about the underlying factors that shape individual members' emotions is important, because these emotions in turn have an impact on the functioning of individual members and the whole group. One group member may shape the emotional pattern of the whole group

in a positive way when displaying high positive emotions or low negative emotions, but even more so in a negative way when displaying high negative emotions or low positive emotions. This finding has important implications for group functioning, since high negative group emotions have been associated with negative group outcomes (e.g., Cole et al., 2008; Duffy & Shaw, 2000; George, 1990).

The finding that both the most and least intense emotions within a group predict other members' emotions also has implications for practice: It may be possible to strategically change the emotion of one group member in order to change other members' emotions. Alternatively, it may also be possible to change the group composition, by removing a "bad apple" from the group, or by bringing an "energizer" into a slacking group.

Conclusion

With one cross-sectional study and one longitudinal study, this research set out to demonstrate that, apart from the prototypical group emotion, also the most and least intense emotions within a group predict individual members' emotions. We proposed that divergent emotions would shape the emotions of other members, because they are salient in groups and thus attract other members' attention. Consistent with our predictions, we found that not only the prototypical group emotion, but also the most and least intense emotions predicted other members' emotions. This was the case for pride, shame, anger and gratitude within groups. In addition, we found stronger effects for the most intense positive and least intense negative emotions. The latter findings are in line with research showing that negative information has stronger effects than positive information. In sum, our research shows that one group member (i.e., the one displaying the most or least intense emotion within his/her group) can shape the

emotions of his or her fellow group members, which may ultimately impact group functioning.

Feel Like You Belong: On the Bidirectional Link between Emotional Fit and Group Identification in Task Groups



This chapter is based on: Delvaux, E., Meeussen, L., & Mesquita, B. (2015). Feel like you belong: On the bidirectional link between emotional fit and group identification in task groups. *Frontiers in Psychology, 6*, 1106. doi:10.3389/fpsyg.2015.01106

6.1. Introduction

Partners of couples and other dyads who spend time together, and members of small groups, such as work and sport teams show higher emotional similarity than what would be expected by chance (Anderson et al., 2003; Barsade, 2002; Bartel & Saavedra, 2000; George, 1990; Gonzaga et al., 2007; Ilies et al., 2007; Tanghe et al., 2010; Totterdell, 2000; Totterdell et al., 1998). This similarity, or 'emotional fit', may point to a shared perspective: Emotions are appraisals of the (social) context, and emotional fit points to some sharing of appraisal (e.g., Elfenbein, 2014; Fischer & Manstead, 2008; Mesquita et al., 2012; Parkinson, 1996). For instance, anger signals that a person is unhappy with a situation, for which someone else is held responsible; in expressing anger, a person feels powerful and in control of the situation (Frijda et al., 1989; P. Kuppens et al., 2003). When two colleagues are angry because another colleague showed up late for a meeting, they interpret the situation similarly. Therefore, emotional fit stands for an alignment of interaction partners.

Individuals who are invested in their relationships and groups appear to have higher emotional fit. Indeed, in small group research, high identifiers' emotions were more related to the group average than were the emotions of low identifiers (Tanghe et al., 2010; Totterdell, 2000; Totterdell et al., 1998). One possible explanation is that high identifiers are more receptive to other group members' take on reality, and thus more readily adopt their emotions. This has been the most common interpretation of the link between group identification and emotional fit with the group; it suggests directionality *from* group identification *to* emotional fit. However, most of the evidence merely establishes a correlation between group identification and emotional fit, without

showing directionality of the process.

An alternative view would be that group identification is an outcome of emotional fit. In this case, experiencing emotions that are typical of the group would be the very reason to feel belonging. If emotions reflect people's position in the (social) world, then it would make sense that emotional similarity is an important ground for association with a group. For instance, feeling identified with Democrats may be largely based on feeling like a Democrat (E. R. Smith et al., 2007). It is plausible that individuals whose emotions resemble those of the majority of a group (In the 2008 elections, the Democrats were 'hopeful,' 'energized,' and 'spirited', among others; Dance, Kueneman, & Pilhofer, 2009) may become attracted to this group, and attach greater importance to it; over time, this would lead to stronger connections with the other group members. Although previous research did establish the *association* between emotional fit and group identification, there is no research to date that documents how group identification *follows* emotional fit. In the current research, we go beyond the association between group identification and emotional fit, and investigate their mutual influence over time.

From Group Identification to Emotional Fit

Several researchers have suggested that group identification precedes emotional fit (Tanghe et al., 2010; Totterdell, 2000; Totterdell et al., 1998). There are two putative pathways (Haslam, 2004; Haslam, Reicher, & Platow, 2011). First, high identifiers pay more attention to other group members, because the group is very central to their identity. Therefore, high identifiers more readily pick up on (emotional) cues sent by other group members, and more readily adjust. Second, high identifiers who

embody the group's values, goals, and possibly emotions, serve as models to the other group members. In this case, other members adjust their emotions to fit those of the high identifiers. Regardless of the pathway, the result would be that members' group identification predicts their emotional fit.

Evidence from correlational studies is consistent with this prediction, but does not address the direction of the link. For instance, in research with teams of nurses, accountants or cricket players, commitment to the team predicted stronger emotional fit (Totterdell, 2000; Totterdell et al., 1998). Similarly, in teams of service employees, the emotions of high team identifiers were more closely linked to the emotions of their team than the emotions of low team identifiers (Tanghe et al., 2010). Furthermore, among self-identified Republicans and Democrats in the US, the emotions of those who were highly identified resembled the average emotional profile more than the emotions of those who were less identified (E. R. Smith et al., 2007).

To our knowledge, the only study that tested the direction of the link between group identification and emotional fit was done by Tanghe and colleagues (2010; Study 2). In this study, the authors manipulated both group identification and the group's emotions at the same time, and found that high identifiers adjusted their emotions more towards the emotions of the group than low identifiers. Although this study demonstrated a causal link from group identification to emotional fit, it suffered from limitations. First, group membership was only imaginary: The participants imagined being part of a team. Second, the manipulation of identification rather than identification per se may have introduced emotional fit: As part of the identification-manipulation, participants had to imagine that "they fit well with the team" (Tanghe et al., 2010, p. 349) and that "there was a good

match between themselves and the other team members" (p. 349).

In sum, despite its theoretical appeal, evidence that group identification promotes emotional fit is limited. In the current research, we investigate the causal link from group identification to emotional fit longitudinally.

From Emotional Fit to Group Identification

Emotions may also be 'the glue that sticks group members together' (Barsade & D. E. Gibson, 1998). Emotional fit itself may strengthen an individual's felt connection to the group, thus amounting to higher group identification. In this case, group identification would be an outcome rather than a precursor of emotional fit. Consistent with this idea, one study found that in-group identification increased after individuals were either made happy about the in-group or angry towards an out-group (Kessler & Hollbach, 2005). Similarly, one's perceived fit with the emotions of other in-group members led to stronger identification with the in-group (Livingstone, Spears, Manstead, Bruder, & Shepherd, 2011). These results suggest that group identification may be the result of emotional similarity between in-group members, rather than merely its antecedent.

The findings on emotional fit are corroborated by a larger body of research showing that fit in other domains contributes to group members' identification. For instance, a meta-analysis on person-organization fit and work attitudes showed that employees' objective fit with the values, goals and personality characteristics that were central to their organization predicted their commitment to the organization (Verquer et al., 2003). Similarly, members' value fit predicted their identification with the group several weeks later (Meeussen et al., 2014). Finally, when members of

minimal groups communicated their ideas about a subsequent negotiation, inducing shared cognition among group members, their group identification had increased at the end of the negotiation (Swaab et al., 2007). It is possible, therefore, that the relationship between emotional fit and group identification goes in the other direction, with fit leading to increased group identification. The current research investigates the causal link from emotional fit to group identification longitudinally.

The Current Research

In three field studies, we aimed to replicate and extend existing research on the association between group identification and emotional fit. The first study was meant to replicate the results from earlier cross-sectional research, using improved methods. The next two studies followed the direction of the relationship between group identification and emotional fit longitudinally, and tested whether either link is stronger than the other.

6.2. Study 1

The aim of the first study, a cross-sectional study with different teams of a large organization, was to replicate the positive association between group identification and emotional fit with the group found by earlier research (Tanghe et al., 2010; Totterdell, 2000; Totterdell et al., 1998) with stronger measures of emotions and emotional fit.

Method

Participants

Participants were 789 employees of a large, semi-governmental Belgian organization who were members of 85 teams, each consisting of 4 to 33

members (M = 9.28, SD = 4.91). Of the 789 participants, 491 were men (62%)[1]. Participants were on average 43.5 years old (SD = 9.73). They had been employed by the same organization for an average of 18 years (SD = 11.67), and had joined their current team for an average of 9.8 years (SD = 8.88). Since participants included both French-speaking and Dutch-speaking Belgians, the questionnaires were administered in French and Dutch respectively[2]. Participants completed the questionnaire in the language of their choice: 46% of the participants chose the French version (n = 362), and 54% the Dutch (n = 427).

Procedure

The current study was part of a larger research on 'Diversity at the workplace' that took place in the organization. After the director of the organization had given his consent, we selected teams to be included in our study. Out of a list of all available teams, we selected the 122 that consisted of 25 employees or less[3], because we assumed that the employees of these teams would interact with each other. Team leaders of all 122 potential teams were contacted by phone; after several attempts, 15% of the team leaders (n = 18) could not be reached, and two percent (n = 2) declined. Of the remaining teams (n = 102), 83% (n = 85) participated in the study.

The team leaders received the number of French and Dutch

[1] One participant was dropped from the analyses because we had reasons to believe he faked his answers: (a) he reported to be sleeping at work, (b) he reported to have no colleagues, yet he also claimed responsibility for 80 employees, (c) he only used the extreme ends of the scales.

[2] The questionnaire was translated and back-translated from Dutch into French by a bilingual translator and checked by two researchers speaking both languages.

[3] Two of the teams in our final sample consisted of more than 25 team members, because they had grown since the team list was made.

questionnaires needed for their teams, and distributed them among the members. Employees who consented to partake in the study, completed the questionnaire individually during work hours; filling out the questionnaire took approximately 30 minutes. After completing the questionnaire, employees returned their completed questionnaires in a sealed envelope to their team leader. The team leaders collected the envelopes from all team members, and mailed them back to the researchers.

Measures

Team identification. Team identification was measured by a seven item-scale (Cronbach's alpha = 0.73): Four items were taken from the identification-scale by Ellemers, Kortekaas and Ouwerkerk (1999) (e.g., "I identify with the other members of my team), and three items from the identification-scale by Roccas, Sagiv, Schwartz, Halevy and Eidelson (2008) (e.g., "Other teams can learn a lot from our team."). Participants rated their agreement with each of the items on 5-point Likert scales ranging from 1 = *Totally disagree* to 5 = *Totally agree*. The mean rating of team identification across participants was 3.54 (*SD* = 0.65).

Emotional fit. Participants rated to what extent they experienced each of 24 emotions during the last month, when they worked together with the other members of their team. We expanded the commonly used list of affect items (e.g., nervous, enthusiastic; 8 items) (e.g., Tanghe et al., 2010; Totterdell, 2000; Totterdell et al., 1998), and added 16 emotion items to more fully reflect the emotion domain (Barrett, Mesquita, Ochsner, & Gross, 2007; e.g., respect for my colleagues, ashamed of my group). Participants rated all emotion items on 5-point Likert scales ranging from 1 = *Very weak* to 5 = *Very strong*.

To measure participants' emotional fit with their team, we used profile correlations (cf. De Leersnyder, Mesquita, & Kim, 2011). Profile correlations measure the co-occurrence of a range of emotions. They provide an objective measure of fit, since the patterns of individual group members and their group are based on different sources (Kristof-Brown, Zimmerman, & Johnson, 2005). To calculate profile correlations, we correlated participants' own emotional pattern (across 24 emotions) with the average emotional pattern of their team, excluding their own values from this team average. Profile correlations have the advantage over difference measures that (a) they take into account information from a whole range of emotions, rather than averaging across these emotions, and (b) they take into account individual differences in scale use. The correlations ranged between -1 and 1, indicating the emotional fit with the team. Participants' emotional fit was calculated if they responded to at least 19 out of 24 emotions. Because the measure of emotional fit was skewed (more data points when getting closer to 1), we transformed the correlations into Fisher's *z* scores before conducting the remaining analyses (Fisher, 1921). The mean emotional fit across participants (Fisher's *z* score) was 1.05 (*SD* = 0.56).

Analyses

We specified a two-level random intercept model, reflecting the nested nature of the data (employees within teams; Hox, 2002). Our main independent variable, team identification, and most control variables (gender, age, team tenure, leadership and language) were situated at the individual level; the control variable team size was a team-level variable.

Results

As expected, we found a positive relationship between team identification and emotional fit with the team: team identification predicted fit to the average emotional pattern of the team (β = 0.40, SE = .03, p < .001)[4] (see Table 6.1).

With regard to the control variables, there was a main effect for leadership (β = 0.09, SE = .04, p = .03): Leaders showed more emotional fit with their team than the other employees. Furthermore, team size emerged as a significant predictor (β = 0.01, SE = .005, p = .02): Employees of larger teams showed relatively more emotional fit.

Table 6.1 Team identification predicts emotional fit in Study 1

	Emotional fit			
	Regression weight	*Standard error*	*t-test (df)*	*p-value*
Intercept	**0.874**	**0.066**	**13.22 (94.66)**	**< .001**
Gender	0.029	0.041	0.70 (694.12)	.487
Age	0.000	0.002	0.07 (694.95)	.941
Team tenure	-0.003	0.002	-1.27 (691.15)	.201
Leadership	**0.091**	**0.041**	**2.21 (651.09)**	**.027**
Language	-0.036	0.042	-0.85 (521.56)	.394
Team size	**0.013**	**0.005**	**2.42 (53.29)**	**.019**
Group identification	**0.400**	**0.027**	**14.68 (687.96)**	**< .001**

Note. Bold numbers represent significant effects.

[4] We also conducted the analyses for the two subscales of group identification separately. The results replicated the results with the combined identification-scale. In addition, the subscales were less reliable than the combined scale (Cronbach's alphas of 0.58 for the scale by Ellemers et al. (1999) and 0.64 for the scale by Roccas et al. (2008)). Therefore, we only report the results for the combined scale.

Discussion

Earlier research showed that compared to less identified team members, the affective state of strongly identified team members is more closely linked to the average affect in the team (Tanghe et al., 2010; Totterdell, 2000; Totterdell et al., 1998). In our research, we similarly found that members' team identification was positively associated with their emotional fit to the team. Team members reported on emotions they had experienced during the last month, when spending time with the team. The emotion scales were selected to cover the full emotion domain, and are more representative of the experiences of team members than measures of positive or negative affect only. Moreover, the correlational measure of emotional fit used in this research does not suffer from the same disadvantages that are associated with the difference measures used in previous research.

The results held true when controlling for gender, age, team tenure, leadership, language and team size. The control variable leadership itself showed an interesting and intuitive relationship with emotional fit, and suggests that indeed group leaders' emotions shape the emotions of their followers (e.g., Sy et al., 2005; Haslam et al., 2011). Team size too predicted emotional fit, but this may have been a methodological artifact: The average group pattern in larger teams is based on more observations and is thus less likely to be "extreme".

6.3. Study 2

The aim of the second study was to establish the link between group identification and emotional fit longitudinally and to test the directionality of this effect. More specifically, we tested if members' group identification

at one point in time predicts their emotional fit with the group at the next, controlling for their emotional fit with the group at the previous point in time. We also tested if members' emotional fit at one point in time strengthens their group identification at the next, when controlling for their group identification at the previous point in time.

Method

Participants

We followed 68 task groups, each consisting of four to six second-year psychology students (M = 4.93, SD = 0.31) at a Dutch-speaking university in Belgium, throughout their collaboration on a joint project. Participants received an online questionnaire (in Dutch) at four different times; all students (N = 295) completed the questionnaire at least once during this collaboration. Attrition rates were low: 83% of the participants completed all questionnaires, and the rate of participation ranged from 98% in the first wave to 88% in the fourth. Because there were no differences between participants who did and did not complete all questionnaires, we included all participants in the analyses (Little's (1988) Missing Completely at Random-test ($\chi^2(168) = 158.90$, *ns*).

The majority of the participants were female (88%); on average, participants were 20.39 years old (SD = 1.20). Demographics reflect the population characteristics of the student body (i.e., second-year psychology students). Participants received 10€ when they completed all four questionnaires, and 3€ when they completed any number lower than four.

Procedure

The study was approved by the Ethics Board of the University of Leuven, and participants signed an informed consent to agree to participate in the study. We recruited all students from a sophomore methods course for psychology majors. The course took a full semester (13 weeks), in which students conducted research. Measurement points marked the end of different steps in the research process: (1) completion of a literature review (week 2), (2) formulating hypotheses (week 4), (3) collecting and analyzing data (week 10), and (4) writing a research report (week 13).

The collaborative project was personally important for the students, because it was worth a full semester credit. Students reported working on the project for an average of 4.36 hours per week (*SD* = 2.37); about one third of this time, they collaborated with the whole group on the project (*M* = 1.45 hours, *SD* = 1.25). Good collaboration paid off, since 90 % of the final course grade was based on the group's performance.

Measures

Group identification. Group identification was measured with six of the seven items used in Study 1; the item "I feel strongly connected to the members of my team" was accidentally omitted from this scale. Participants rated their agreement with each of the items on 5-point Likert scales ranging from 1 = *Totally disagree* to 5 = *Totally agree*.

Emotional fit. Participants rated to what extent they had felt each of 14 emotions (e.g., pride about the group, angry at the other group members) when working together with the other members of their group in the time since the last measurement. To limit the burden on participants (who were asked to fill out the questionnaire at four different times), we reduced the number of emotions in this study as compared to Study 1.

Participants rated the emotion items on 5-point Likert scales ranging from 1 = *Very weak* to 5 = *Very strong*. Emotional fit was calculated using the procedure as described for Study 1.

Table 6.2 summarizes the means, standard deviations and Cronbach's alphas for group identification and emotional fit at each of the four waves.

Table 6.2 Means, standard deviations and reliabilities for group identification and emotional fit with the group (Study 2)

	Week 2	Week 4	Week 10	Week 13
		M (SD)		
		Cronbach's alpha		
Group identification	3.59 (0.60)	3.56 (0.62)	3.51 (0.74)	3.40 (0.77)
	0.77	0.78	0.86	0.85
Emotional fit (Fisher z-transformed)	1.10 (0.63)	1.11 (0.64)	1.00 (0.58)	1.11 (0.63)

Analyses

To investigate the interplay between group identification and emotional fit, we used multilevel structural equation modeling. More specifically, we estimated a fully cross-lagged path model. We were particularly interested in the cross-lagged paths because they estimate the effect of one variable at one time point on another variable at the next time point, controlling for the other variable at the previous time point as well as controlling for within-time associations. Hence, we were able to estimate the effect of group identification on emotional fit as well as the effect of emotional fit on group identification over time. We estimated all within-time correlations and autoregressive paths to control for their effects. Since

individual group members were nested within task groups, we specified multilevel models to take into account that observations were not independent (Hox, 2002).

Model specifications. In structural equation modeling, model selection takes place by comparing the respective fit of different models. More restricted (= more simple) models are compared against less restricted (= more complex) models. The more restricted model is chosen over the less restricted model when model restrictions do not result in significant decreases of the model fit.

In our data, we first tested an unrestricted model with all parameters freely estimated. Next, we compared this model with two restricted models. First, we did not predict that the links between emotional fit and group identification in whichever direction would differ across time. Therefore, we restricted the cross-lagged paths to be equal over time and compared the restricted model to the unrestricted model. If the model fit does not significantly decrease by equating these paths, the effects can be considered to be equal over time.

Second, we also did not have any a priori ideas about the direction of the link between group identification and emotional fit. To test whether the effect of emotional fit on group identification was stronger than the effect of group identification on emotional fit, or vice versa, we restricted the model by equating the links in both directions, and comparing this restricted model to the previous restricted model. If the model fit significantly decreases by equating these paths, one of the effects can be considered stronger than the other; if the model fit does not significantly decrease by equating these paths, the effects can be considered equally strong in both directions.

Each tested model's fit was evaluated using two common indices to evaluate model fit: a model with an RMSEA-value than .10, and preferably .06, and a CFI-value higher than .90, and preferably .95 indicate adequate to excellent model fit (Hu & Bentler, 1999; Kline, 2005). The same indices are also used to evaluate change in model fit when testing a more restricted model against a less restricted model. When the change in RMSEA is smaller than .015 and the change in CFI is smaller than -.01, the more restricted model is chosen over the less restricted model (Cheung & Rensvold, 2002; Vandenberg & Lance, 2000).

Results

The selected model (see Figure 6.1) shows a mutual, positive relationship between members' group identification and their emotional fit over time. Equating the cross-temporal paths from group identification to emotional fit as well as from emotional fit to group identification, did not result in a significant decrease of the model fit ($\Delta RMSEA$ = -.015, ΔCFI = .004), suggesting similar effects over time. More specifically, members' group identification at one point in time predicted their emotional fit with the group at the next, controlling for their group identification at the previous time. Conversely, members' emotional fit with their group at one time predicted their group identification at the next, controlling for their own emotional fit at the previous time. Thus, the higher (lower) group members' identification at one point in time, the higher (lower) their emotional fit at the next, and vice versa.

Moreover, it was possible to equate the path from group identification to emotional fit to the path from emotional fit to group identification ($\Delta RMSEA$ = -.004, ΔCFI = .001), indicating that the effect

was equally strong in both directions. These effects were found, both when controlling for within-time correlations between group identification and emotional fit, and when controlling for the autoregressive effects of group identification and emotional fit; all within-time correlations and autoregressive effects were significant.

In sum, our results document a bidirectional effect that was equally strong in both directions: not only did members' group identification predict their emotional fit with the group, but members' emotional fit with the group also predicted their group identification.

Discussion

In Study 2, we extended the results of Study 1 by testing the directionality of the link between members' group identification and their emotional fit to the group. A multilevel cross-lagged path analysis showed that group identification and emotional fit with the group mutually influenced each other over time. Moreover, these effects were equally strong in both directions. To our knowledge, our study is the first study that provides evidence for a bidirectional link between group identification and emotional fit using a longitudinal design.

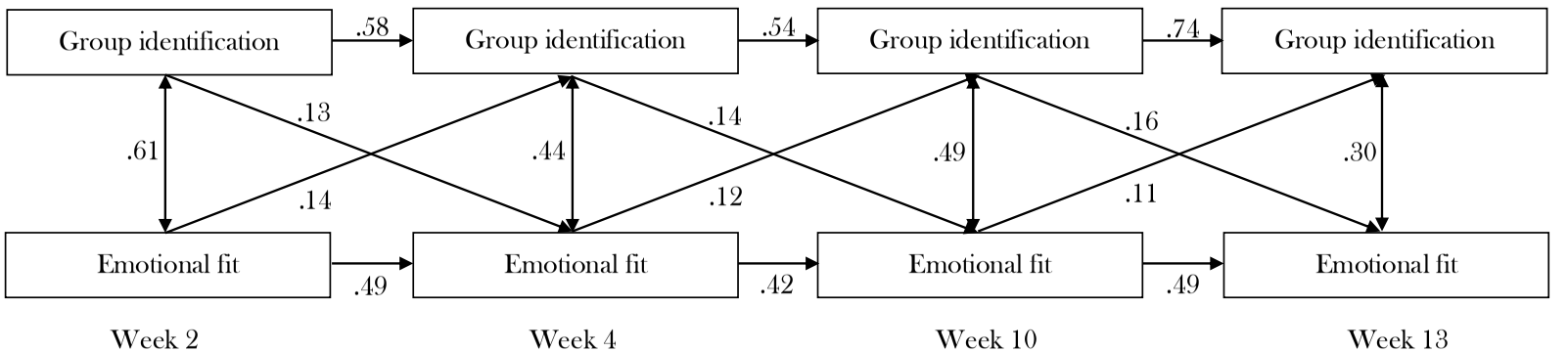


Figure 6.1 Fully cross-lagged multilevel model outlining the relation between group identification and emotional fit over time (Study 2). The numbers in the figure represent the standardized betas. Model fit was excellent: CFI = .99, RMSEA = .05. The results converged with and without controls (age, gender and number of friends at the start of the project), as well as with the full identification scale, and the identification subscales (Ellemers et al., 1999 vs. Roccas et al., 2008). The presented model is the model without controls and with the full identification scale. *Note*. All *p*s < .001.

6.4. Study 3

The third study aimed to replicate the results of Study 2, using sociometric data to measure members' identification to their group. Sociometric data provide an implicit measure of group identification. They allow to infer a person's strength of their connection to the group from their connections with every individual group member. Convergence of the results based on this implicit measure of identification with those based on the explicit measures of group identification used in the previous studies would inspire confidence in the conclusions.

We followed student work groups over time, and measured group identification by examining the strength of the connections between different group members. Whereas the student work groups in Study 2 consisted of white and primarily female psychology students, the work groups in Study 3 consisted of ethnically diverse and primarily male engineering students. As in Study 2, we investigated the mutual influence between group identification and emotional fit with the group over time.

Method

Participants

We followed 33 task groups throughout their collaboration on a project; each task group consisted of five to seven group members plus one group leader (group size: $M = 7.24$, $SD = 0.66$). The group members were first-year engineering students and the group leaders were fourth-year engineering students at a French-speaking university in Belgium. All students ($N = 239$) completed a paper-and-pencil questionnaire (in

French)[5] at least once during their collaboration. Attrition rates were somewhat higher than in Study 2, but still 72% of the participants completed all three waves. The participation rate was 90% in wave 1, 79% in wave 2, and 92% in wave 3. We included all participants in the analyses, since participants with and without missing data did not significantly differ from each other on the variables of interest (Little's (1988) Missing Completely at Random-test ($\chi^2(85) = 93.69$, *ns*)).

On average, group members were 18.5 years old (*SD* = 1.12) and group leaders were 22 years old (*SD* = 1.98); 79% of the group members were men and 70% of the group leaders were men. Demographics reflect the population characteristics of the student body (i.e., first- and fourth-year engineering students). All participants took part in the study voluntarily. Students of two participating groups received cinema tickets via a lottery after the study was completed.

Procedure

The study was approved by the Ethics Board of the University of Leuven, and participants signed an informed consent to agree to participate in the study. We recruited participants during the launch session of an engineering course. For this course, students worked together on a group project for six months. During this period, they designed and built a technical device that could heat water by means of physical activity (e.g., pedaling or rowing); the group leader guided the process. At the end of the project, students handed in a written report on their group project and presented their prototype to an external jury. The group project was

[5] The questionnaire was translated and back-translated from Dutch into French by a bilingual translator and checked by two researchers speaking both languages.

significant, both in terms of its place in the curriculum and in terms of time spent on it. On average, the students 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). At three times during the project, students completed the questionnaire: in week 7, week 21 (with six weeks of holiday and exams in between) and in week 24 (after presenting their prototype to an external jury).[6]

Measures

Group identification. In the current study, we measured group identification by sociometric data rather than by a self-reported summary statement. Group identification was the average strength of the ties of an individual group member to all the other group members. Ties were measured as the extent of (1) liking, (2) getting along with, and (3) being attuned to a particular group member. To obtain a group member's identification, we first averaged an individual participant's ratings (of all the other group members) per item; we then averaged across the three items. Averaging across items was justified, as factor analyses yielded one single factor at each point in time, and the reliabilities of the resulting three-item scales were excellent (see Table 6.3).

Emotional fit. Emotional fit was measured in the same way as in Studies 1 and 2. In this study, the emotional concordance score was based

[6] We did not succeed in our aim to make the intervals between measurement times similar. The timing of the different waves (at 7, 21, and 24 weeks) was primarily motivated by pragmatic considerations. After 7 weeks, the group leaders had the opportunity to distribute the questionnaire to their group members for the first time. The large gap between the first wave (week 7) and the second (week 21) was due to a 6-weeks semester break. Finally, the last questionnaire was distributed to the group members immediately after they presented their work to an external jury (week 24), and therefore right before the group's dissolution.

on 27 emotions (e.g., respect towards other group members, enthusiastic, irritation towards other group members, nervous). Participants' emotional fit was calculated if they responded to at least 22 out of 27 emotions.

Table 6.3 summarizes the means, standard deviations and Cronbach's alphas for group identification and emotional fit.

Table 6.3 Means, standard deviations and reliabilities for group identification and emotional fit with the group (Study 3)

	Week 7	Week 21	Week 24
		M (SD)	
		Cronbach's alpha	
Group identification	3.68 (0.54)	3.71 (0.53)	3.85 (0.55)
	0.84	0.92	0.92
Emotional fit (Fisher z-transformed)	1.10 (0.44)	1.10 (0.48)	1.20 (0.48)

Analyses

The analytic strategy in this study is the same as in Study 2. To investigate the relationship between group identification and emotional fit with the group, we estimated multilevel cross-lagged models using structural equation modeling techniques.

Results

Figure 6.2 shows support for a bidirectional link between group identification and emotional fit. As expected, we found a mutual, positive relationship between members' group identification and their emotional fit over time. Given that the decrease in model fit was not significant, we

equated the paths from group identification to emotional fit and from emotional fit to group identification over time ($\Delta RMSEA$ = -.002, ΔCFI = -.007), such that their effects were equal over time. More specifically, members' group identification at one point in time predicted their emotional fit with the group at the next, controlling for their group identification at the previous time. Similarly, members' emotional fit with their group at one time predicted their group identification at the next, controlling for their own emotional fit at the previous time.

Moreover, the model fit did not deteriorate significantly when the paths from group identification to emotional fit and from emotional fit to group identification were set equal to each other ($\Delta RMSEA$ = -.004, ΔCFI = -.002). Thus, the link is bidirectional and equally strong in both directions. As in Study 2, the results were true when controlling for within-time correlations between group identification and emotional fit as well as when controlling for the autoregressive effects of both group identification and emotional fit; all of these effects were also significant.

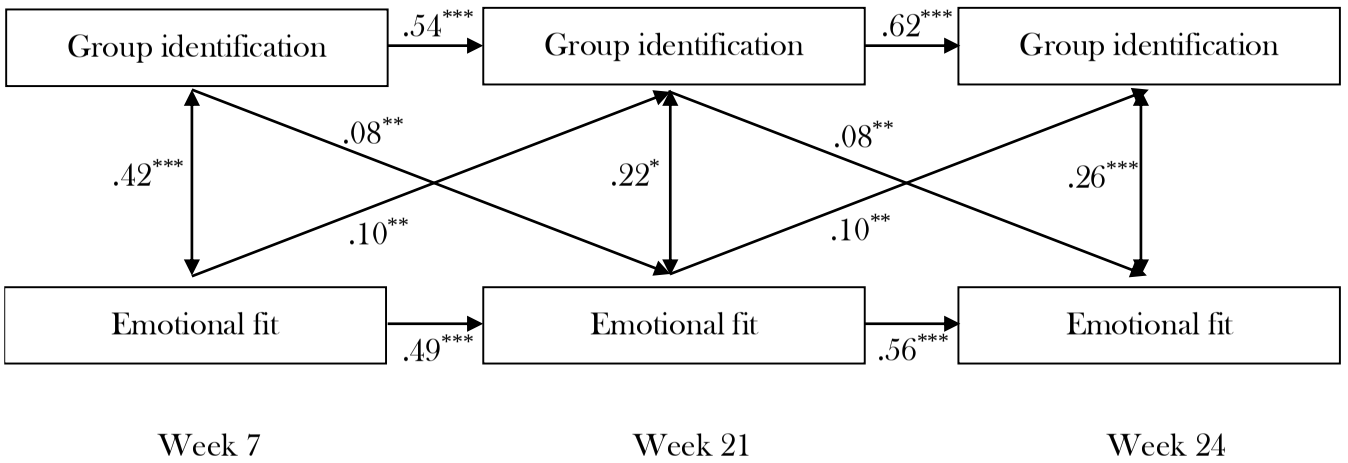


Figure 6.2 Fully cross-lagged multilevel model outlining the relation between group identification and emotional fit over time (Study 3). The numbers in the figure represent the standardized betas. Model fit was good: CFI = .97, RMSEA = .07. The results converged with and without controls (age, gender and leadership). The presented model is the model without controls.

Note. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Discussion

In Study 3, we replicated the results of Study 2: we found evidence for a bidirectional link between group identification and emotional fit over time. The results of Study 2 and 3 converged despite important differences between the two studies. A first difference concerns the measurement of group identification: In study 2, we measured self-reported connectedness with the group, and in Study 3, we used sociometric data. Second, sample characteristics differed: Groups in Study 2 consisted of White and majority female students, whereas the groups in Study 3 were ethnically diverse, and predominantly male. Moreover, the participants of Study 2 were psychology students, whereas the participants of Study 3 were engineering students. Finally, the questionnaires in Study 2 were administered in Dutch, whereas the questionnaires in Study 3 were administered in French. In sum, two longitudinal studies with naturally occurring student work groups yielded converging evidence for a bidirectional link between group identification and emotional fit with the group.

6.5. General Discussion

Across three studies, following "real" interactive task groups working on tasks that were meaningful and important to them, we found that group identification predicts members' emotional fit, a link that had been suggested by previous research (Tanghe et al., 2010; Totterdell, 2000; Totterdell et al., 1998). We replicated this relationship, using different measures of group identification and considering a broader range of emotions than had been included by these previous studies. Moreover, we used profile correlations to measure emotional fit instead of difference

measures. Emotional fit in terms of profile correlations points to an alignment of group members' perspective on the situation, and this alignment may be initialized by a strong connection with the group. In addition, we also found evidence for the reverse effect: emotional fit also predicts group identification. When group members' emotions are aligned, and thus their perspectives on the situation as well, they start feeling more connected with their group.

Our two longitudinal studies established a bidirectional relationship between group identification and emotional fit. Furthermore, the effects were equally strong in both directions: there were feedback loops between group identification and emotional fit, such that group identification and emotional fit either mutually reinforce or mutually dampen each other. In the context of small, interactive task groups, both group identification and emotional fit are thus dynamic rather than stable over time.

Relevance for Group Outcomes

The dynamic interplay between group identification and emotional fit suggests that a change in the one variable, brings about a change in the other. This may set in motion a positive or negative spiral, affecting members' well-being, motivation and performance in the group. Indeed, higher levels of emotional fit and group identification have both been associated with positive outcomes.

On the one hand, many studies have shown that emotional fit benefits relationship outcomes. For instance, emotional fit in dyadic relationships predicts satisfaction with the relationship (Anderson et al., 2003; Gonzaga et al., 2007; Locke & Horowitz, 1990; Towsend, Kim, & Mesquita, 2014; Verhofstadt et al., 2008). Similarly, emotional fit with one's culture is positively associated with relational well-being (De

Leersnyder et al., 2014). Finally, in top management teams, members' affective fit with the team is positively related to their satisfaction with the interpersonal relationships in the team (Barsade et al., 2000).

On the other hand, group identification has been found to motivate members to contribute to the group's goals. Members who are highly identified with the group are thus more motivated to work on the group's tasks as well as to perform better on these tasks (Ellemers, De Gilder, & Haslam, 2004; Meeussen et al., 2014; Worchel, Rothgerber, Day, Hart, & Butemeyer, 1998).

Practical Implications

Team members who are aware of the dynamic interplay between group identification and emotional fit, will be able to break a negative spiral or promote a positive spiral. Similarly, group interventions leveling at improving either group identification or emotional fit may promote positive outcomes for the group (e.g., Anderson et al., 2003; Ellemers et al., 2004). Team building activities provide a good framework to attain these goals.

On the one hand, team building activities may strengthen group identification. Previous research has shown that group members identify more strongly with their group after personally contributing to their group's identity (Jans, Postmes, & van der Zee, 2012; Meeussen et al., 2014; Swaab, Postmes, & Spears, 2008). An intervention including all group members, aiming at jointly building a group identity (cf. "an inductive route to social identity formation", Jans et al., 2012) would be one way to increase members' group identification.

On the other hand, team building activities may be used to increase emotional fit by encouraging discussion about the meaning of events. For

instance, we think of a framework like the one provided by H. H. Clark and Wilkes-Gibbs (1986), in which interaction partners took turns communicating about ambiguous stimuli until they reached a common understanding of the stimuli. During this process, and throughout different interaction turns, partners increasingly reached agreement on the meaning of stimuli. Similarly, exercises where group members discuss emotional scenarios with the aim of reaching a common understanding of the situation may improve the process of emotional appraisal, thus increasing emotional fit.

Limitations and Future Directions

Although we have established the bidirectional link between group identification and emotional fit longitudinally, the processes underlying this link have yet to be explored. As discussed in the introduction, there are two different processes that may bring about high identifiers' stronger emotional fit to the group. High identifiers may either more readily align their emotions with those of other group members, or they may set an example to the other group members (Haslam, 2004; Haslam et al., 2011). Future studies should examine the conditions under which each of these pathways occur.

Another limitation, at least for the longitudinal studies, is that they focused on newly formed groups. The studies thus pertain to identification and emotional fit of group members who have just started to collaborate. Future research may study whether the bidirectional link remains over time, or only exists during group formation. Longitudinal research on teams that have been in existence for some time (such as the teams included in the first study) should be expected to shed light on this issue.

Furthermore, the current research describes general processes of

identification and fit across group members. Future research may disentangle the trajectories of different types of group members: individuals with either high or low group identification, or either high or low emotional fit. To establish different trajectories, and thus monitor fluctuations over time, research might benefit from measuring group identification and emotional fit at shorter intervals.

Another direction for future research is to study how different mean patterns of emotional experience influence the outcomes associated with emotional fit. Emotional fit may not always be functional or advantageous. For instance, fit to a pattern that is characterized by high levels of anger may be less beneficial than fit to a pattern that is characterized by high levels of group pride. Similarly, fit to a pattern that is characterized by intense anger and low levels of other emotions may be less beneficial than fit to a pattern that is characterized by equally intense anger that is accompanied with high levels of respect and sympathy. The former in each comparison may lead to worse group outcomes, whereas the latter may benefit group outcomes.

Conclusion

To conclude, three studies with real-life, interactive task groups yield a bidirectional link between group identification and emotional fit with the group. Over time, group identification predicted emotional fit, but the reverse link was found as well. Interventions that improve either one may thus affect both processes. This may lead to better group relationships and better group performance. Conversely, a decrease in either group identification or emotional fit may lead to deteriorations in both, and thus negatively affect group outcomes.

Group Climate Matters: The Association between Group Identification and Emotional Fit Revisited



This chapter is based on: Delvaux, E., De Leersnyder, J., & Mesquita, B. (2015). *Group climate matters: The association between group identification and emotional fit revisited*. Manuscript submitted for publication.

7.1. Introduction

Group members often share emotions (e.g., Barsade & D. E. Gibson, 1998, 2012; Bartel & Saavedra, 2000; George, 1990; Kelly & Barsade, 2001; E. R. Smith et al., 2007). As an example, think of a group of supporters before, during, or after a game of soccer: They are hopeful at the start of a match, jointly cheer at every good pass, hold their breath in suspense at a counter by the other team, and either cry in despair or fight in anger after losing a game. Stated differently, individual soccer fans share the emotions of their fellow soccer fans.

Of course, there are individual differences: Not every soccer fan is a 'die hard'. Accordingly, the emotions of some supporters fit the typical or average emotional experience of the group of supporters better than those of others. Previous research has suggested that, compared to less identified supporters, fans who are strongly identified with their soccer team experience and express emotions that fit with the team's standing in the game, and with the team's outcomes after the game (e.g., Crisp, Heuston, Farr, & R. N. Turner, 2007; Wann, Dolan, McGeorge, & Allison, 1994). This is first evidence to suggest that group identification is related to fit with the group patterns of emotional experience and expression.

Research on emotions in work groups has similarly yielded higher emotional fit with the average or typical patterns of their group for high as compared to less identified team members. For instance, commitment to the team predicted for nurses, accountants and cricket players how closely their moods were related to the average mood of their team (Totterdell, 2000; Totterdell et al., 1998). Similarly, the levels of positive and negative affect reported by employees in service organizations were closer to the

average of their team, the more they identified as team members (Tanghe et al., 2010). In sum, evidence from work groups in organizations converges on the positive association between group identification and emotional fit.

Explaining the Link between Group Identification and Emotional Fit: The Need to Be Similar versus the Need to Be Positive

The association between group identification and emotional fit can be understood in at least two different ways. First, group identification may come with the need to be similar to the group (e.g., Tanghe et al., 2010); in this case, highly identified group members would have a desire to be emotionally similar to other members of the group. If group membership is more central to high than to low identifiers (e.g., Hogg & Abrams, 1988; Tajfel & J. C. Turner, 1986), high identifiers are likely to pay more attention to (the emotions of) other group members than low identifiers (e.g., Haslam, 2004), and more likely to adjust their own emotions accordingly.

Second, group identification may be associated with the need to be positive about the group (Crocker & Luhtanen, 1990; Ellemers et al., 1997; Wann & Branscombe, 1990). Since the group is more central to the self-concept of high identifiers than to that of low identifiers, staying positive is an effective strategy for high identifiers to guarantee or to maintain good feelings about themselves (Crocker & Luthanen, 1990; Ellemers et al., 1997; Glasford et al., 2009). Indeed, several studies have shown that high group identifiers engage in group-affirmation strategies, even when the group is not doing well. For instance, in one study where Hindus, Sikhs and Canadians were asked to freely recall acts of violence and aggression from their in-group towards an out-group, high in-group

identifiers recalled fewer of these acts as compared to low in-group identifiers (Sahdra & Ross, 2007). In another study, highly identified Dutch respondents felt less guilty about their (violent) colonial past than did less identified Dutch respondents (Doosje et al., 1998). These findings suggest that high identifiers actively maintain a positive outlook on their own group in order to protect their group-esteem.

In the current research, we examine which of those needs best explains the link between group identification and emotional fit. We study this link in both a positive and a negative group climate. In a positive group climate, the need to be similar and the need to be positive would both predict a higher emotional fit for highly identified group members. However, different predictions would be made for a negative group climate. According to the need to be similar, high identifiers share the negative feelings of the other group members; in this case, group identification would be positively related to emotional fit, regardless of the group climate. In contrast, according to the need to be positive, high identifiers have higher levels of positive and lower levels of negative emotions than less identified group members (e.g., Crocker & Luhtanen, 1990; Glasford et al., 2009), and this should result in higher emotional fit in a positive, but not in a negative group climate.

Previous research was not set up to distinguish between the need to be similar and the need to be positive, because it has merely focused on positive group climates. For instance, Totterdell and colleagues found a relatively high emotional fit for high as compared to low identifiers, but the group climate in two studies was positive: The nurses in the first study reported few team hassles (on average 2.9 on a scale from 1 to 9; Totterdell et al., 1998), and the average mood of the cricket players in the second study was above the midpoint of a mood scale ranging from being unhappy

to being happy most of the time (Totterdell, 2000). Similarly, Tanghe and colleagues (2010) reported high emotional fit among members who strongly identified with the team, and again the group climate was positive: On average, the team members reported high positive affect and low negative affect. In the current research, we will study the link between group identification and emotional fit under a negative in addition to a positive group climate, enabling us to distinguish between the need to be similar and the need to be positive.

The Current Research

The aim of the current research is to test two hypotheses. First, the Group Climate Moderation Hypothesis holds that the link between group identification and emotional fit is different for positive and for negative group climates (see also Figure 7.1). In a positive group climate, we expect to replicate the positive association between group identification and emotional fit. However, in a negative group climate, we hypothesize that high identifiers have poorer emotional fit than low identifiers, because they have a need to be positive about the group. This hypothesis is tested against the null hypothesis that high identifiers have a better emotional fit than low identifiers, because of their need to be similar. Second, we test the Emotion Mediation Hypothesis that the emotional fit of high identifiers can be accounted for by high levels of positive and low levels of negative emotions, in positive and negative group climates alike (see also Figure 7.2).

In Study 1, we will examine how the link between group identification and emotional fit naturally unfolds in small work groups, depending on the valence of the group climate. Group climate in this study is inferred from group members' perceived in-group conflict. In Study 2,

we focus on the link between group identification and emotional fit, using a controlled task to test our hypotheses. In this study, vignettes describing either a positive or a negative interaction with other team members will be used to study the emotional reactions of the members of real teams of an organization.

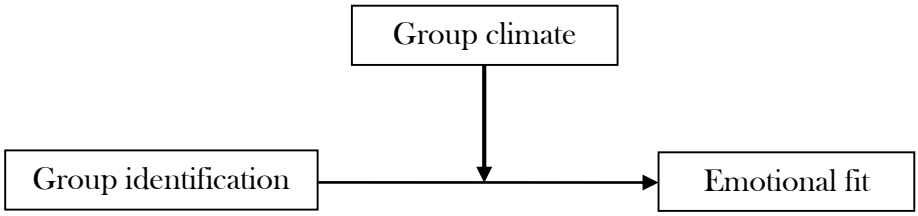


Figure 7.1 Group Climate Moderation Hypothesis.

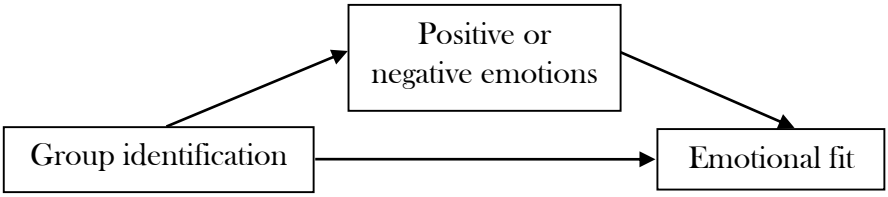


Figure 7.2 Emotion Mediation Hypothesis.

7.2. Study 1

The first study took place in an educational setting, and followed the link between group identification and emotional fit over time. Group climate was considered positive, if the level of conflict reported by the group members was low, and negative if the reported conflict was high. We investigated whether the emotional fit of high identifiers was different

depending on the group climate, in this case, the level of reported conflict within the group (Group Climate Moderation Hypothesis). In addition, and unraveling the underlying mechanisms of the link between group identification and emotional fit in terms of emotional experience, we examined whether members' group identification predicted higher levels of positive and lower levels of negative emotions respectively, and whether emotional intensity in turn predicted group members' emotional fit with the group (Emotion Mediation Hypothesis).

Method

Participants

We followed 295 second year psychology students, belonging to 68 task groups of four to six students (M = 4.93, SD = 0.31) in a four-wave longitudinal study. The majority of the participants (83.7%) filled out a questionnaire at all four waves. Wave 1 counted most participants (98.0% of the students who agreed to participate); wave 4 counted least (88.1% of the students who agreed to participate).

On average, participants were 20.39 years old (SD = 1.20). Most of them were women (88.2%); this percentage reflects the composition of the student body. Data analyses included all participants who completed the questionnaire at least once, since 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 ($\chi^2(85)$ = 65.99, ns). Participants who completed the questionnaires at all four waves received €10; participants who completed the questionnaires at less than four waves received €3.

Procedure

Participants were recruited from a Methods course for psychology majors, in which they collaborated in small task groups. During one semester (13 weeks), the course assignment was to design, conduct, and report psychological research. The Methods course is an important part of students' curriculum, presumably motivating the students to do well. Students reported spending on average 4.36 hours a week (*SD* = 2.37) on the project of which one third (*M* = 1.45 hours, *SD* = 1.25) was spent on group work. Collaboration was important, because 90% of students' final grade depended on the group project.

At four, carefully selected times during the semester, participants responded to an online questionnaire: in the second week (wave 1), after they completed the literature review; in the fourth week (wave 2), after they designed the research; in the tenth week (wave 3), after they had conducted their research and analyzed the data; and in the thirteenth week (wave 4), after they completed their research report.

Measures

Emotions. Participants rated to what extent they felt each of six positive emotion items (e.g., pride about the group, gratitude towards the group) and each of eight negative emotion items (e.g., shame about the group, anger towards the group) since the last measurement time. Each item was rated on a 5-point Likert scale ranging from 1 = Very weak to 5 = Very strong. Factor analyses restricted to two factors yielded the expected division by valence for the first two waves, but not for the last two waves. Nonetheless, we decided to create positive and negative emotion scales, because these scales were reliable at all four waves (Cronbach's alphas were always higher than 0.80, see also Table 7.1).

Emotional fit. To calculate participants' emotional fit with their team –which is defined as an individual's emotional similarity to their group's typical or average emotional pattern (see also De Leersnyder et al., 2011)– we first calculated an average emotional pattern for each group. Next, we correlated each group member's own emotional pattern (across 14 emotions) with their group's average emotional pattern; each time excluding the group member's own scores from his or her group's average emotional pattern. We repeated this for each time point. The resulting correlations ranged between -1 (indicating low emotional fit with the group) and 1 (indicating high emotional fit with the group). Before conducting other analyses, we transformed the correlations to Fischer's z scores (Fischer, 1921).

Group identification. Group identification was measured with six items: four items from the identification-scale by Ellemers and colleagues (1999) (e.g., "I identify with the other members of my team"), and two items from the identification-scale by Roccas and colleagues (2008) (e.g., "Other teams can learn a lot from our team"). Participants rated their agreement with each item on a 5-point Likert scale ranging from 1 = Totally disagree to 5 = Totally agree. The six items were combined into one scale, which showed good reliability at each time point (Cronbach's alphas were equal to or higher than 0.77, see also Table 7.1).

Group conflict. Group conflict was measured with the intragroup conflict scale (Jehn, 1995; e.g., "How much friction is there among the members of your group?"). To restrict the burden on the participants, we selected six out of the original eight items that overlapped least in content. Items were rated on a 5-point Likert scale ranging from 1 = None/Never to 5 = Very much/Very often. The six items formed one scale, which was reliable at each time point (Cronbach's alphas were equal to or higher than

0.79, see also Table 7.1). The intraclass correlations (ICCs, see e.g., Kenny et al., 1998) were significant at each point in time, which allowed us to aggregate this variable, thereby situating it at the group level (ICC_{week2} = 0.25; ICC_{week4} = 0.22; ICC_{week10} = 0.35; ICC_{week13} = 0.51).

Table 7.1 displays the Cronbach's alphas, means, and standard deviations of the variables described in the Measures section at the different time points.

Table 7.1 Means, standard deviations and reliablities of the variables at the differen time points (Study 1)

	Week 2	Week 4	Week 10	Week 13
		M (SD)		
		Cronbach's alpha		
Positive emotions	3.34 (0.55)	3.37 (0.60)	3.45 (0.65)	3.51 (0.66)
	0.81	0.84	0.84	0.83
Negative emotions	1.63 (0.57)	1.65 (0.59)	1.85 (0.66)	1.86 (0.70)
	0.84	0.88	0.86	0.88
Emotional fit (Fischer Z transformed)	1.10 (0.63)	1.11 (0.64)	1.00 (0.59)	1.10 (0.63)
Group identification	3.59 (0.60)	3.56 (0.62)	3.51 (0.74)	3.40 (0.77)
	0.77	0.78	0.86	0.85
Group conflict (group level)	1.88 (0.34)	2.00 (0.35)	2.27 (0.48)	2.36 (0.60)
	0.79	0.83	0.87	0.88

Analyses

Group Climate Moderation Hypothesis. To examine whether the positive relationship between group identification and emotional fit depended on the level of group conflict, we tested a moderation model with an interaction between group identification and group conflict. We used multilevel analyses, because the data had a nested structure (Hox, 2002). The data consisted of three levels: the time level, the individual level, and the group level. We specified a random intercept-model to allow for variance at each of the three levels. Group identification, group conflict and the interaction between identification and conflict were entered as time-varying predictors at the first level. Age and gender were added as control variables at the individual level (level 2). Finally, group size was added as a control variable at the group level (level 3). All time-varying predictors were set at Time T_i, and the outcome variable (= emotional fit with the group) was set at Time T_{i+1}[1]. We thus used time-lagged analyses to test this hypothesis.

Emotion Mediation Hypothesis. Across groups with positive and negative climates, we tested whether members' group identification predicted their emotional experience (of both positive and negative emotions) and whether this emotional experience in turn predicted their emotional fit with the group by means of mediation analyses. Following the recommendations by Preacher and colleagues (Preacher, Zhang, & Zyphur, 2011; Preacher, Zyphur, & Zhang, 2010), we performed multilevel mediation with all variables situated at the lowest level, while controlling for the nested nature of the data. We entered group

[1] We did not control for emotional fit at the previous time, because the focus of the paper is not on change in emotional fit.

identification at T_i and both emotional experience and emotional fit at T_{i+1}. We repeated the analyses for three time frames (between week 2 and week 4, between week 4 and week 10, and between week 10 and week 13), and with both positive and negative emotions as mediators.

Results

Group Climate Moderation Hypothesis: Does the link between group identification and emotional fit depend on the group climate?

The three-level regression model yielded support for the Group Climate Moderation Hypothesis, and suggested that the link between group identification at one point in time and emotional fit at the next point in time depends on the group climate (for the full results, see Table 7.2).

Concretely, the main effect of group identification (β = 0.26, SE = 0.03, $p < .001$; $M_{\text{high identifiers}}$ = 1.28, SD = 0.56; $M_{\text{low identifiers}}$ = 0.86, SD = 0.61) was qualified by an interaction between group identification and group conflict in predicting group members' emotional fit (β = -0.30, SE = 0.06, $p < .001$): The positive relationship between group identification and emotional fit was attenuated for members of a group with higher group conflict (i.e., negative group climate) as compared to members of a group with lower group conflict (i.e., positive group climate; Figure 7.3). In other words, in groups characterized by a more negative group climate, members' group identification was less strongly related to their emotional fit with the group than in groups characterized by a more positive group climate.

The model explained 20% of the total variance in emotional fit across levels: It explained variance both at the individual and the group level (see also Table 7.2; Hox, 2002). The finding that the link between

group identification and emotional fit is attenuated in a negative group climate as compared to a positive group climate, provides some first evidence for the need to be positive about the group, and suggests that fitting in may not always be the most important motivation for high identifiers.

Table 7.2 Testing a moderation effect of group conflict (operationalization of group climate) on the relationship between group identification and emotional fit (Study 1)

	Estimate (standard error)
Intercept	1.023 (0.041) ***
Gender	0.033 (0.069)
Age	-0.040 (0.020) *
Team size	-0.021 (0.120)
Group identification (GI)	0.262 (0.033) ***
Group conflict (GC)	-0.042 (0.072)
GI * GC	-0.299 (0.063) ***
Total variance explained	20%

Note. *p < .05, ***p < .001. The variance explained by the final model is compared to the variance of the model with only the random intercept.

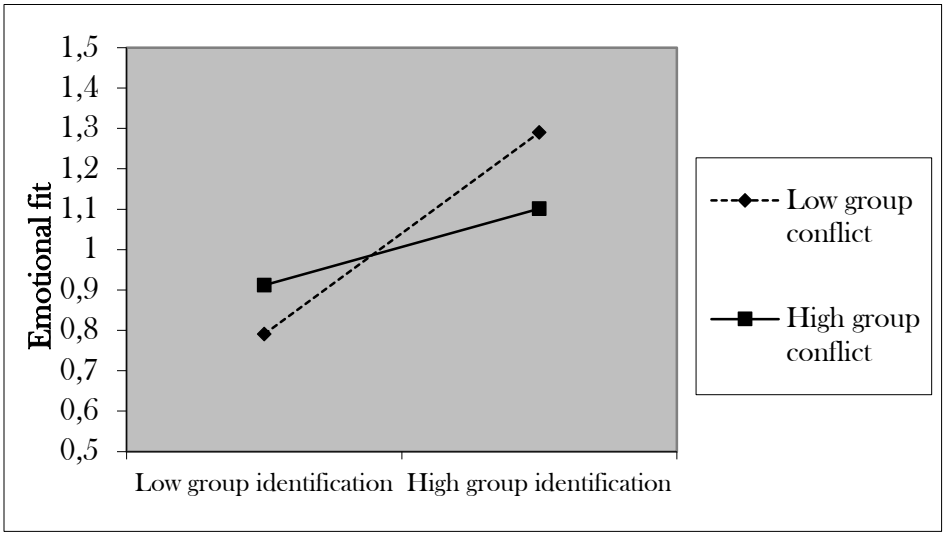


Figure 7.3 Interaction between group identification and group conflict (operationalization of group climate) in predicting group members' emotional fit (Study 1).

Emotion Mediation Hypothesis: Emotional experience (of both positive and negative emotions) mediates the relationship between group identification and emotional fit.

For each measurement time, yet averaging across groups with positive and negative climates, we conducted two mediation analyses, one with positive and one with negative emotions. The six resulting multilevel mediation models yielded evidence for the Emotion Mediation Hypothesis: The relationship between group identification and emotional fit was, in every time lag, mediated by members' mean levels of positive and negative emotions (for the full results, see Figure 7.4)[2]: High group identifiers experienced higher levels of positive and lower levels of negative emotions

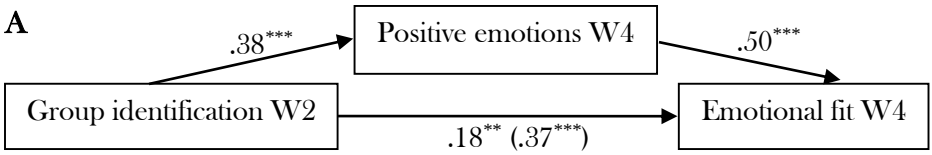
[2] In Appendix A.3, Table A.12 provides the estimates and standard errors for all mediation models.

than low group identifiers. In turn, yet aggregated across positive and negative group climates, group members with higher levels of positive and lower levels of negative emotions showed greater emotional fit with their group. Although all direct effects of group identification on emotional fit were mediated by positive and negative emotions respectively, only the direct effects of group identification on emotional fit between week 4 and week 10, and between week 10 and week 13, were fully mediated by negative emotions.

As follow-up analyses to detect differential effects of group climate on the links between group identification and (positive and negative) emotional experience on the one hand, and between (positive and negative) emotional experience and emotional fit on the other, we tested which one of these two links would be moderated by the valence of the group climate. Consistent with the hypothesis that high group identifiers are more motivated to experience positive emotions than to fit in, we found that the link between group identification and emotional experiences was *not* moderated by the level of group conflict: high group identifiers experience higher levels of positive and lower levels of negative emotions regardless of the level of group conflict ($\beta_{\text{positive emotions}}$ = -.06, ***SE*** = .06, p = .37; $\beta_{\text{negative emotions}}$ = .01, ***SE*** = .07, p = .87). Moreover, and also consistent with this hypothesis, we found that the link between (positive and negative) emotional experience and emotional fit with the group *was* moderated by the level of group conflict. Specifically, higher levels of positive and lower levels of negative emotions lead to an attenuated relationship with emotional fit in groups with high as compared to groups with low conflict ($\beta_{\text{positive emotions}}$ = -.12, ***SE*** = .07, p = .09; $\beta_{\text{negative emotions}}$ =

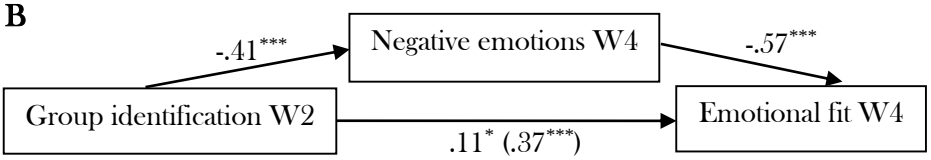
.24, *SE* = .08, *p* = .002)[3]. In sum, the mediation effects provide further evidence that the need to feel positive about the group may trump the need to fit with the group.

A



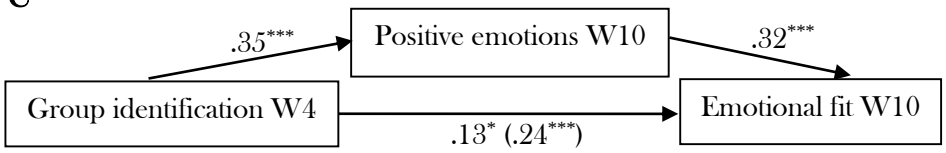
Model fit: CFI = 1.00, RMSEA = .00; Indirect effect: β = 0.19, *SE* = 0.04, p <.001, 95% CI [.11,.28]

B



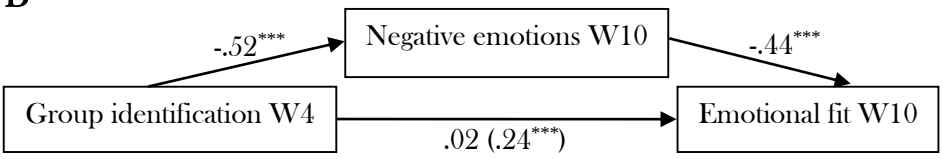
Model fit: CFI = 1.00, RMSEA = .00; Indirect effect: β = 0.23, *SE* = 0.06, p <.001, 95% CI [.11,.35]

C



Model fit: CFI = 1.00, RMSEA = .00; Indirect effect: β = 0.11, *SE* = 0.03, p <.001, 95% CI [.06,.16]

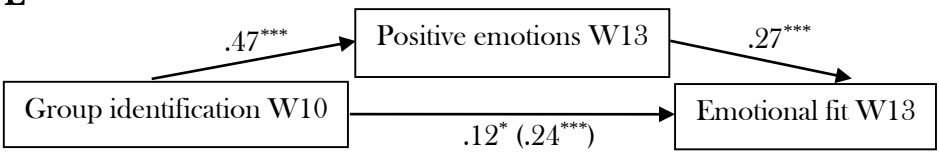
D



Model fit: CFI = 1.00, RMSEA = .00; Indirect effect: β = 0.23, *SE* = 0.05, p <.001, 95% CI [.13,.23]

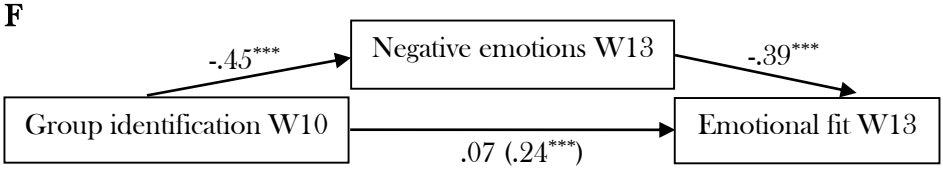
[3] In Appendix A.3, Figure A.1 displays the moderating effects of group conflict on the association between (positive or negative) emotional experience and emotional fit with the group.

E



Model fit: CFI = 1.00, RMSEA = .00; Indirect effect: β = 0.13, *SE* = 0.03, p <.001, 95% CI [.06,.19]

F



Model fit: CFI = 1.00, RMSEA = .00; Indirect effect: β = 0.18, *SE* = 0.04, p <.001, 95% CI [.10,.26]

Figure 7.4 (Positive and negative) emotions as mediators between group identification and emotional fit with the group.

Note. Mediation models with positive emotions (PANEL A, C en E) and negative emotions (PANEL B, D, and F). The numbers in the graphs respresent unstandardized estimates of the effects. All models fit the criteria for good model fit (CFI > .90 and RMSEA < .08; see Hu & Bentler, 1999). *** p < .001, ** p <.01, * p <.05.

Discussion

Consistent with the findings from previous emotion research in groups and teams (Delvaux, Meeussen, & Mesquita, 2015b; E. R. Smith et al., 2007; Tanghe et al., 2010; Totterdell, 2000; Totterdell et al., 1998), we found a positive relationship between group identification and emotional fit for those groups reporting a positive group climate. We established this relationship in a longitudinal time-lagged design showing that members' group identification at one time predicted their emotional fit to the group at the next time.

Furthermore, we tested whether this relationship depended on the valence of the group climate (i.e., Group Climate Moderation Hypothesis). Our results showed that the relationship between group identification and emotional fit indeed depended on the valence of the group climate, suggesting that high identifiers' primary motivation is to have positive experiences within their group, rather than to fit in with their group. This explanation was further explored with mediation analyses (i.e., Emotion Mediation Hypothesis), which showed that, indeed, high identifiers experience higher levels of positive and lower levels of negative emotions, regardless of the group climate, which in turn attenuate their emotional fit with the group in a negative as compared to a positive group climate.

Taken together, the results of this first study thus suggest that the relationship between group identification and emotional fit is attenuated in a negative as compared to a positive group climate, because high identifiers experience higher levels of positive and lower levels of negative emotions within their group, regardless of the valence of the group climate.

7.3. Study 2

Whereas Study 1 had the advantage that we studied group emotions in their natural setting, the disadvantage was that group members' emotion ratings may have referred to very different situations. In Study 2, group members rated their emotions in response to two standardized, hypothetical vignettes – one describing a highly positive situation at work, and one describing a highly negative situation at work. As in Study 1, we tested the Group Climate Moderation Hypothesis and the Emotion Mediation Hypothesis.

Method

Participants

Participants were 789 employees of a large Belgian organization. They were part of 85 teams consisting of 4 to 33 members (M = 9.28, SD = 4.91; 36% female). On average, participants were 43.5 years old (SD = 9.73), had been employed by the organization for 18 years (SD = 11.67), and had been part of their team since 9.8 years (SD = 8.88). Forty-six percent of the participants identified as French-speaking (n = 362); the other identified as Dutch-speaking (n = 427).[4]

Procedure

The current study was part of a larger research project on 'Diversity in the workplace'. The director of the organization consented to the study, and provided a list of eligible teams. From this list, we selected the 122 teams that consisted of 25 or fewer employees, because we expected personal interaction in these teams.[5] We attempted to contact the team leader of each of these teams by phone. Fifteen percent (n = 18) of the team leaders could not be reached by phone, and 2% (n = 2) declined to participate in the study. The remaining 102 teams received the questionnaires. Eighty-two percent (n = 85) of the teams that were reached by phone ended up completing the questionnaire (70% of the 122 teams that we initially selected for inclusion).

[4] One participant was excluded from the analyses because we suspected that his answers were faked: he reported sleeping the whole time during working hours; he reported leading a group of employees, yet reported to have no direct colleagues; he used the extreme ends of the scale most of the time.

[5] Two selected teams had more than 25 employees, because they had grown since the lists were made available.

Team leaders received the number of questionnaires needed for their team, and distributed the questionnaires among all members of their team. Team members received the questionnaire in their native language (either Dutch or French), together with a return envelope that could be sealed. Team members completed the questionnaire individually during work hours, and returned it sealed to their team leader.

Standardized positive and negative vignettes

All participants read two vignettes describing situations at work: A positive vignette first, followed by a negative vignette. After each vignette, participants answered some questions. The positive vignette read: "You have been very busy at work for the last few weeks. A few colleagues who themselves have been less busy, just lightened your load by taking over some of your tasks." The negative vignette read: "Your boss just gave you the assignment that you had always hoped for. A few colleagues challenge your boss's decision, and claim that you are not the right person to do this type of task, even though you have never even had a chance to prove yourself on this task."

Measures

Emotions. In response to each vignette, participants rated the intensity of eight positive emotion items (e.g., proud of my colleagues, enthusiastic; Cronbach's alphas: 0.91 (positive vignette) and 0.94 (negative vignette)) and eight negative emotion items (e.g., angry at my colleagues, nervous; Cronbach's alphas: 0.87 (positive vignette) and 0.81 (negative vignette). A factor analysis restricted to two factors yielded the expected distinction by valence. Participants rated the emotion items on 5-point Likert scales ranging from 1 = *Very weak* to 5 = *Very strong*. The mean intensity of

positive emotions across participants was 3.75 (*SD* = 0.71) in response to the positive vignette, and 1.98 (*SD* = 0.63) in response to the negative vignette, whereas the mean intensity of negative emotions across participants was 1.98 (*SD* = 0.85) in response to the positive vignette, and 2.49 (*SD* = 0.81) in response to the negative vignette.

Emotional fit. Emotional fit was calculated in the same way as in Study 1. The mean, Fischer-transformed emotional fit score across participants was 1.52 (*SD* = 0.65) in response to the positive vignette, and 0.42 (*SD* = 0.52) in response to the negative vignette.[6]

Group identification. Group identification was measured with seven items (Cronbach's alpha = 0.73), six of which were the same as in Study 1; the extra item belonged to the identification scale of Roccas et al. (2008), and was accidentally omitted in the first study. Participants rated their agreement on 5-point Likert scales ranging from 1 = *Totally disagree* to 5 = *Totally agree*. The mean rating of group identification across participants was 3.54 (*SD* = 0.65). Group identification was measured before participants read the vignettes.

Analyses

Group Climate Moderation Hypothesis. To examine whether the positive relationship between group identification and emotional fit with the group depended on the valence of the vignette, we tested a moderation model by entering an interaction between group identification and type of

[6] The emotional fit in response to a positive situation is higher than the emotional fit in response to a negative situation. This may be because there is more variation in the emotional experience of people in negative as compared to positive contexts. Alternatively, because people distinguish less between positive than between negative emotions, the agreement or fit can be lower in negative as compared to positive contexts.

vignette. As in Study 1, we specified a random intercept-model to allow for variance at the three levels. At level 1, we entered type of vignette as a main independent variable. At level 2, gender, age, team tenure, leadership and language were entered as controls, and group identification was entered as a main independent variable. At level 3, we entered group size as a control variable. Finally, we added the cross-level interaction between valence of the vignette (level 1) and group identification to the model (level 2). The Group Climate Moderation Hypothesis was confirmed if this interaction term significantly predicted emotional fit.

Emotion Mediation Hypothesis. By means of mediation analyses, we tested whether members' group identification predicted their experience of (both positive and negative) emotions, and whether emotional experience in turn predicted emotional fit with the group. For each type of vignette (positive and negative), and for each type of emotion (positive and negative), we ran a separate model. Formulas were similar to the ones used in Study 1.

Results

Group Climate Moderation Hypothesis: Does the link between group identification and emotional fit depend on the group climate?

The three-level regression model yielded evidence that the relationship between group identification and emotional fit with the group depends on the valence of the vignette (i.e., group climate; for the full results, see Table 7.3).

In addition to a significant main effect of the valence of the vignette (β = 1.10, SE = .03, p < .001; $M_{positive}$ = 1.52, SD = 0.65; $M_{negative}$ = 0.42, SD = 0.52) and a significant main effect of group identification (β = -0.08, SE = .03, p = .02; $M_{high\ identifiers}$ = 1.04, SD = 0.84; $M_{low\ identifiers}$ = 0.92, SD = 0.75), we found an interaction effect between the valence of the vignette and the level of group identification (β = 0.40, SE = .04, p < .001; see also Figure 7.5). In line with previous research, there was a positive relationship between group identification and emotional fit in response to the vignette describing a positive work situation ($t_{(661.47)}$ = 8.69, p < .001): High identifiers (M = 1.70, SD = 0.55) showed greater emotional fit with their group than low identifiers (M = 1.34, SD = 0.68). However, the relationship between group identification and emotional fit with the group reversed in response to the vignette describing a negative situation at work: High identifiers (M = 0.37, SD = 0.51) showed less emotional fit with their group than low identifiers (M = 0.48, SD = 0.52; $t_{(624.90)}$ = -2.03, p = .04). The model explained 54% of the total variance in emotional fit across levels (see also Table 7.3; Hox, 2002). In sum, the results provided evidence for the Group Climate Moderation Hypothesis.

Table 7.3 Testing a moderation effect of vignette (operationalization of group climate) on the relationship between group identification and emotional fit with the group (Study 2)

	Estimate (standard error)
Intercept	0.354 (0.033)***
Gender	0.084 (0.036)*
Age	-0.006 (0.002)**
Team tenure	-0.002 (0.002)
Leadership	0.065 (0.037)†
Language	-0.042 (0.036)
Group size	0.013 (0.004)***
Group identification (GI)	-0.075 (0.030)*
Vignette (-/0 vs. +/1)	1.108 (0.029)***
GI * Vignette	0.403 (0.044)***
Total variance explained	54%

Note. † p < .10,* p < .05,** p < .01, *** p < .001. The variance explained by the final model is compared to the variance of the model with only the random intercept.

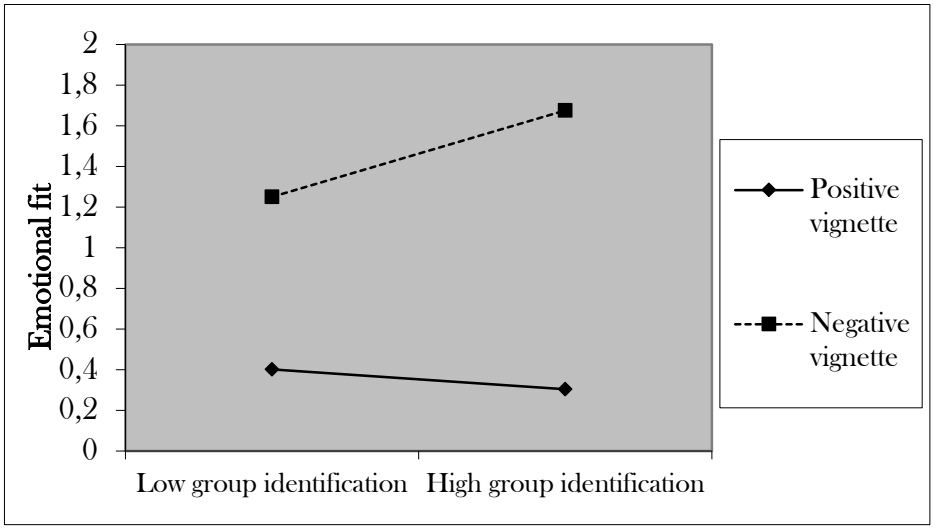


Figure 7.5 Interaction between group identification and type of vignette (operationalization of group climate) in predicting group members' emotional fit (Study 2).

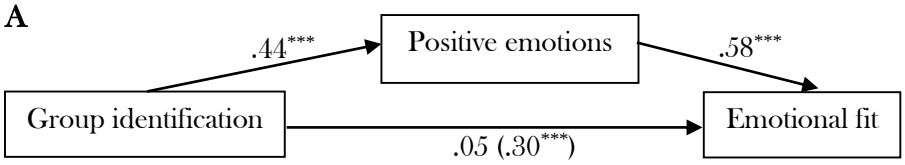
Emotion Mediation Hypothesis: The experience of (both positive and negative) emotions mediates the relationship between group identification and emotional fit.

Four different mediation models confirmed the Emotion Mediation Hypothesis: In each case, the relationship between group identification and emotional fit was mediated by group members' mean levels of positive and negative emotions (for the full results, see Figure 7.6[7]). High group identifiers experienced higher levels of positive and lower levels of negative emotions regardless of the valence of the vignette. Furthermore, the tendency to experience higher levels of positive emotions predicted higher emotional fit in response to the positive vignette, but lower

[7] In Appendix A.3, Table A.13 provides the estimates and standard errors for all mediation models.

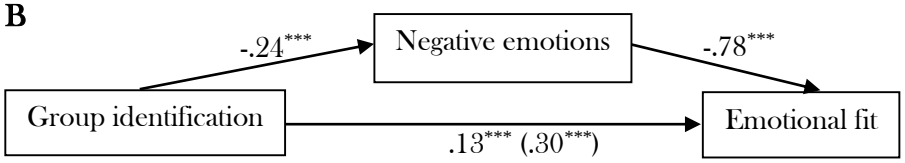
emotional fit in response to the negative vignette, whereas the tendency to experience higher levels of negative emotions predicted lower emotional fit in response to the positive vignette, but higher emotional fit in response to the negative vignette (see also Figure 7.6).

A



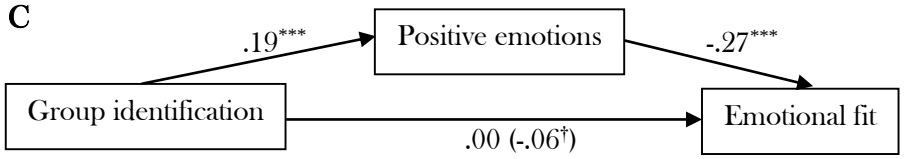
Model fit: CFI = 1.00, RMSEA = .00; Indirect effect: β = 0.26, *SE* = 0.03, p <.001, 95% CI [.20,.31]

B

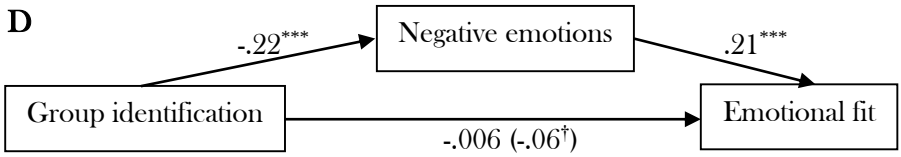


Model fit: CFI = 1.00, RMSEA = .00; Indirect effect: β = 0.19, *SE* = 0.04, p <.001, 95% CI [.12,.25]

C



Model fit: CFI = 1.00, RMSEA = .00; Indirect effect: β = -0.05, *SE* = 0.02, p = .003, 95% CI [-.09,-.02]



Model fit: CFI = 1.00, RMSEA = .00; Indirect effect: β = -0.05, *SE* = 0.02, p = .004, 95% CI [-.08,-.01]

Figure 7.6 (Positive and negative) emotions as mediators between group identification and emotional fit with the group.

Note. Mediation models with positive emotions (PANEL A and C) and negative emotions (PANEL B and D) as mediators for positive situations (PANEL A and B) and for negative situations (PANEL C and D). The numbers in the graphs respresent unstandardized estimates of the effects. All models fit the criteria for good model fit (CFI > .90 and RMSEA < .08; see Hu & Bentler, 1999). † p < .10, *** p < .001.

Whereas positive emotions fully mediated the relationship between group identification and emotional fit in response to both types of vignettes, negative emotions fully mediated this relationship in response to a negative vignette, and only partially in response to a positive vignette. In sum, high identifiers' tendencies to experience both higher levels of positive and lower levels of negative emotions resulted in higher emotional fit with the group when the group climate is positive, but in lower emotional fit when the group climate is negative.

Discussion

In Study 2, we tested our two hypotheses, using standardized vignettes that described either a positive or a negative situation at work. Consistent with the findings of Study 1, this study demonstrated that group climate moderated the relationship between group identification and emotional fit with the group. More specifically, highly identified group members had more emotional fit in response to a vignette describing a positive situation at work, thus replicating findings from earlier studies (e.g., Delvaux, Meeussen, & Mesquita, 2015b; Tanghe et al., 2010; Totterdell et al., 1998), and less emotional fit in response to a vignette describing a negative situation at work.

We also found evidence for the Emotion Mediation Hypothesis: High identifiers experienced higher levels of positive emotions and lower levels of negative emotions than low identifiers; and this was true regardless of the group climate. In the case of the negative vignette, this resulted in a lower emotional fit for high, as compared to low, group identifiers; When other group members report low intensity positive and high intensity negative emotions, they still report high intensity positive and low intensity negative emotions. As a result, high identifiers had a stronger emotional fit in response to the description of a positive situation at work, but a weaker emotional fit in response to the description of a negative situation at work than their less identified counterparts.

7.4. General Discussion

Previous work found a positive relationship between an individual's identification with the group and their emotional fit (Delvaux, Meeussen, & Mesquita, 2015b; E. R. Smith et al., 2007; Tanghe et al., 2010;

Totterdell, 2000; Totterdell et al., 1998). In the current research, we further examined this link. In two studies, we found support for the Group Climate Moderation Hypothesis that group identification shows the strongest relationship with emotional fit, when the group climate is positive. In a longitudinal study with natural groups (Study 1), we found that the relationship between group identification and emotional fit with the group was less positive in groups that were characterized by more conflict among group members (i.e., a more negative group climate) as compared to groups that were characterized by less conflict among group members (i.e., a more positive group climate). In our quasi-experiment (Study 2), we found a positive relationship for the positive vignette, but a negative relationship for the negative vignette; vignettes described valenced situations at work. In support of our hypothesis, both studies converged on the finding that the relationship between group identification and emotional fit need not be positive, and depends on the group climate.

We also premised that emotional fit is a result of high identifiers' need to be positive about the group (e.g., Crocker, & Luhtanen, 1990; Glasford et al., 2009) as a strategy to protect their self-worth (e.g., T. Kuppens and Yzerbyt 2014; Sherman & Cohen, 2006). Our second hypothesis "the Emotion Mediation Hypothesis" built on this premise, and postulated that the link between group identification and emotional fit is mediated by an individual's emotional experience. In support of this hypothesis, we found in both studies that, compared to low identifiers, high group identifiers experienced higher levels of positive and lower levels of negative emotions; this was true, regardless of the valence of the group climate. Mediation analyses showed that both higher levels of positive and lower levels of negative emotions accounted for emotional fit: Emotional fit with the group was lower in the negative as compared to the

positive group climate. Put differently, high identifiers felt positive, regardless of the group climate: They kept feeling positive under negative circumstances, despite the fact that their fellow group members did not. This conclusion converges with those of a large-scale sociological research project describing soccer fans in 17 European countries: The 'real' soccer fan is someone who stays positive, looks at the bright side and keeps believing in the team, even when it is losing the game (Social Issues Research Center, 2008).

Limitations and Future Directions

In both studies, group climate moderated the relationship between group identification and emotional fit with the group. However, the moderating effects differed between Study 1 and 2. In Study 1, the positive relationship between group identification and emotional fit in a positive group climate was attenuated in a negative group climate, whereas in Study 2 this positive relationship was even reversed. The different results may be due to differences in the degree to which the group climate was perceived to be negative: The negative vignette described an acute threat, whereas conflict in the first study may have been simmering. Future studies in naturalistic settings will need to focus on acute conflict, and examine whether group identification in emotional fit is also reversed in such settings.

Both studies yielded evidence for the Emotion Mediation Hypothesis, but the two studies differed in the extent to which negative and positive emotions mediated the relationship between group identification and emotional fit. In the first study, only negative emotions fully mediated the relationship, and only at later points in time. In contrast, in the second study, positive emotions fully mediated the relationship in response to both positive and negative vignettes, whereas negative

emotional experience fully mediated the relationship in response to the negative, but not positive vignettes. The reason for this imbalance in the mediating patterns remains unclear.

Although Study 1 was longitudinal, the life of the groups was relatively short. Future research should shed light on the link between emotional fit and group identification in the long run. Whereas high group identifiers have a more positive outlook on negative situations in the shorter run, in the long run, they may become more negative, or even disengage from the group. This disengagement may be fed by a continued emotional misfit. If this were the case, group climate may thus not only be a crucial factor to understand the interplay between an individual's group identification and their emotional fit with the group at any given time, but would also be essential to understanding how group identification and emotional fit shape each other over time.

Conclusion

To sum up, the current research shows that the link between group identification and emotional fit with the group depends on the group climate. In a positive group climate, the relationship between group identification and emotional fit with the group is strong and positive; in a negative group climate, the relationship between group identification and emotional fit is attenuated, or even reversed. In addition, this research suggests that high group identifiers' motivation to fit in with their group may not always be the strongest motivation and is, therefore not (the only) driving mechanism behind group identification and emotional fit. Instead, high group identifiers want to feel positive about the group, even if that means that their emotions will not be congruent with their fellow group members' emotions. Given that high group identifiers may take the lead

in their group (e.g., Ellemers et al., 2004), knowing more about their emotional experience and how their emotional experience relates to the emotional experience of fellow group members will provide important insights into the dynamics of the whole group.

Discussion



8.1. Introduction

This dissertation develops a dynamic approach to emotions in groups. Drawing on recent research in emotion science, I conceive of emotions as dynamic relational processes which take place in social interactions and which enable the development of shared appraisals and coordinated action in evolving social relationships or groups (Fischer & Manstead, 2008; Frijda & Mesquita, 1994; Mesquita et al., 2012; Parkinson et al., 2005; Tiedens & Leach, 2004). While research in emotion science has focused mostly on dyadic relationships, my research bridges recent emotion research with separate research traditions on emotions in groups and organizations. As such, it follows up on a recent 'affective turn' in research on groups and organizations, which conceives of group emotions as functional for group well-being and productivity.

Although extant research has demonstrated the existence of emotional similarity between group members (e.g., Barsade, 2002; Bartel & Saavedra, 2000; George, 1990; Ilies et al., 2007; Sy et al., 2005; Totterdell, 2000; Totterdell et al., 1998), it is less clear how this emotional similarity comes about. My research adds to the extant research on groups and organizations a dynamic approach of emergent group emotions through selective emotional influence between group members. Its main aim is to investigate when and how members of interactive task groups influence each other's emotions towards convergence and whether the resulting group emotions are conducive to the well-being and productivity of groups. More specifically, this dissertation was centered around three research aims. A first aim was to establish the process of emotional convergence in task groups over time. A second aim was to study processes of selective emotional influence leading up to emotional convergence as

well as the consequences of the resulting (specific) group emotions for group functioning. Finally, a third aim was to investigate individual differences in emotional influence between group members.

The main empirical reason why we know so little about the process of emotional convergence in task groups is that most of the research to date is cross-sectional in nature. Furthermore, the research that has investigated the emotions of task group members longitudinally has focused on within-time congruence rather than on processes of influence and convergence over time. Knowing more about the processes leading up to emotional similarity between group members is important, because emotional similarity is linked to the functioning of both individual members and the whole group (e.g., Barsade, 2002; Barsade & Knight, 2015; Bartel & Saavedra, 2000; Cole et al., 2008; George, 1990; Grawitch, Munz, & T. J. Kramer, 2003; Knight & Eisenkraft, 2015; Totterdell, 2000; Totterdell et al., 1998). Hence, research on the processes underlying emotional convergence in task groups provides both theoretical and practical insights that may be used to alter group processes and group outcomes.

In the following section, I first provide an overview of the main findings of each empirical chapter, guided by the three research aims of this dissertation. Next, I discuss the theoretical contributions of this dissertation to emotion theory and group psychology. Then, I highlight several practical implications of my research. Finally, I discuss some limitations of my research, as well as some new questions that have arisen from the findings of this dissertation.

8.2. Overview of the Findings

Emotional Convergence in Task Groups over Time

The first aim of this dissertation was to establish emotional convergence in task groups. Combining the empirical evidence that task group members show similarity of emotions (e.g., George, 1990; Totterdell, 2000), and that members of dyads grow more similar in their emotions over time (Anderson et al., 2003), I proposed that task group members would show emotional convergence over time. To investigate this, I followed real-life task groups longitudinally at several moments during their collaboration. I tested whether, over time, group members influenced each other's emotions towards emotional convergence.

In Chapter 2, I investigated whether group members influenced each other's anger and gratitude over time. Anger and gratitude were chosen because they can be seen as positive and negative evaluations of another person's behavior, and will thus be important catalyzers of group processes. As expected, I found several indicators of convergence for both anger and gratitude levels. First, over time, an individual member's emotions and the emotions of the other group members mutually influenced each other. Second, increased intra-class correlations also pointed to a process of convergence. Increasing intra-class correlations were all the more meaningful against the backdrop of increasing standard deviations across time: Despite the fact that the total variance of gratitude and anger experiences (across all participants) increased over time, members within groups grew closer to each other with respect to their levels of anger and gratitude.

In Chapter 3, I investigated the process of emotional convergence with two studies. In the first study, I replicated the results of Chapter 2

with another emotion that is thought to be relevant for group processes, namely group pride; this emotion reflects on a group's achievements and successes. As in Chapter 2, I found that group members influenced each other's group pride, such that there was convergence over time (as also indicated by an increasing intra-class correlation over time). In the second study of Chapter 3, I extended the findings of the first study by examining emotional influence processes via status networks (see also in the later section on individual differences in emotional influence). Status networks provide a more stringent test of emotional influence at the micro-level of dyads than when emotional influence is studied between one group member and the whole group. In this study, I also found evidence for emotional convergence in groups. More specifically, group pride spreads via high-status members. Network analyses of gratitude yielded that, like group pride, gratitude also spreads via high-status members (**Chapter 3bis**). In sum, across different chapters, I found evidence for emotional influence processes between group members, leading to emotional convergence.

Selective Emotional Influence towards Emotional Convergence and Consequences for Group Functioning

The second aim of this dissertation was to investigate the conditions of emotional convergence in task groups; I addressed several conditions that selectively facilitate emotional influence. In addition, I examined whether emotional similarity –i.e., emergent group emotions as a result of emotional convergence– predicts group functioning.

Selective emotional influence facilitates emotional convergence

My research was premised on the idea that emotions do not transfer to other people unless they are either relevant to these other people themselves, or informative about a situation of joint relevance (Elfenbein, 2014; Hess & Fischer, 2013; Parkinson, 2011). The idea is in contrast with earlier theories on emotional convergence that assumed that emotions transfer between people unconditionally (emotional contagion; cf. Hatfield et al., 1994). Given the premise that emotional convergence is conditional, the second aim of this dissertation was to investigate the conditions of mutual emotional influence in task groups. Concretely, in this dissertation, I studied whether emotional influence in groups depends on a) the emergent emotion norms within groups, and b) the information conveyed by specific emotions that occur in groups.

In Chapter 2, I studied whether emotional convergence develops around emergent group norms on emotions. Consistent with earlier research on emotion norms (e.g., Hochschild, 1983; Saarni, 2008), and with theorizing on emotion norms in groups (e.g., Barsade & D. E. Gibson, 1998; Kelly & Barsade, 2001), I found that norms of anger and gratitude guide group members' emotional experience over time. Moreover, I also found evidence for the reverse relationship, namely that, over time, group members' experiences of anger and gratitude contribute to the emergence of emotion norms in groups. This latter finding is in line with the idea that people infer norms from the behavior (in this case emotions) of others (Cialdini & Goldstein, 2004). Thus, group norms on emotions not only guide the emotional alignment of individual group members, they are also informed bottom-up by the emotional experiences of individual group members. I conclude that emotion norms are dynamic rather than stable group characteristics.

In **Chapters 2 and 3(bis)**, I demonstrated that emotional influence between group members is also selective with regard to the meaningful content of an emotion. In line with the idea that emotions that communicate relevant and applicable information to other group members will converge in groups (Elfenbein, 2014; Hess & Fischer, 2013; Moreland et al., 1996; Parkinson, 2011), I hypothesized that emotions that bear group-relevance would converge in groups, because these emotions provide information about group processes and group functioning. Conversely, emotions that do not bear group-relevance were not expected to converge in groups. In support of this hypothesis, anger (Chapter 2), gratitude (Chapters 2 and 3bis) and group pride (Chapter 3), emotions that were selected because they are jointly relevant to all group members, were found to show convergence in groups. These emotions carry information about task and relational processes within groups, and as such, they contain an evaluation of these group processes. Conversely, self-pride (Chapter 3), an emotion that lacked a focus on group processes, did not show convergence in groups. I conclude that informational constraints on mutual emotional influence between group members derive from the meaningful contents of emotions in groups.

In sum, the studies in this dissertation show that emotional convergence is selective to the extent that group members' emotions are norming and informing others' emotions in the group and vice versa. I conclude that my findings provide evidence for the selectivity of emotional influence in groups. In order to predict which emotions will converge through group interactions, it is essential to articulate normative and informational constraints on emotional convergence (e.g., Barsade & Gibson, 1998; Elfenbein, 2014).

Consequences of (specific) group emotions for group functioning

As part of the second research aim, I investigated whether the emotional similarity that results from the process of emotional convergence predicts task group functioning. More specifically, in Chapter 4, I tested whether specific group-level emotions predict specific group outcomes over time. Previous studies have found that group-level affect (or mood) predicts group outcomes (Barsade, 2002; George, 1990; Totterdell, 2000). In this research, I went beyond valence. Specifically, I compared emotions such as gratitude or pride, which are similar on valence, but different with regards to other dimensions (cf. Lerner & Kelter, 2000, 2001). These dimensions were clearly related to the group outcomes: Collective gratitude was the strongest predictor of relational outcomes (i.e., group liking and relational conflict), and collective group pride was the strongest predictor of task outcomes (i.e., collective efficacy and group performance). Collective self-pride, an emotion that did not reflect on group functioning, did not predict any of the outcomes (after controlling for the other emotions). To conclude, this study shows that important group outcomes can be predicted from specific group emotions. My research adds to previous studies by focusing on the associations between specific emotions (rather than affect or mood) and group outcomes.

Individual Differences in Emotional Influence

The third aim of this dissertation was to investigate individual differences in emotional influence. Starting from the assumption that emotional influence is often unevenly distributed between group members, I asked the question "Who influences whom in task groups?". I proposed that individuals may differ in the extent to which their emotions influence the emotions of other group members, and in the extent to which their own

emotions are attuned to others' emotions in the group. Specifically, I focused on individual differences in social status and emotion intensity to predict differential emotional influence on other group members. Focusing on emotional attunement, I examined individual differences in group identification to predict group members' emotional fit, or the similarity of their individual emotions to the group emotions. In addition, I tested whether group identification and emotional fit would be more strongly related in groups with a positive emotional climate as compared to groups with a more negative climate.

Social status

In this dissertation, I investigated whether high-status group members have more emotional influence. My research built on earlier findings that group leaders influence the emotions of followers (Chi et al., 2011; Erez et al., 2008; Sy et al., 2005), and that the lower status partner of both romantic couples and roommates adjusted his or her emotions towards the emotions of the higher status partner (Anderson et al., 2003). To test the hypothesis that status is linked to emotional influence, I used a longitudinal social network analysis. This type of analysis provides a more fine-grained analysis of emotional influence in groups because it studies emotional influence at the dyadic rather than at the group level.

As predicted, I found evidence that the emotions of high-status group members influence the emotions of the other group members who grant them status, but only when these emotions were relevant to all group members: Low-status group members were influenced by the group pride (**Chapter 3**) and gratitude (**Chapter 3bis**) of high-status members, but not by high-status members' self-pride (**Chapter 3**). Emotional convergence

depended once again on the information that is conveyed by a particular emotion (see also research aim 2).

Emotion intensity

Not only high-status group members, but also members that display the most or the least intense emotions within their group may have a disproportionate influence on other members' emotions. This hypothesis is drawn from the literature on minority influence. Research on the influence of minorities in decision making has demonstrated that dissenters, who consistently disagree with the other members, may change the group's opinion (e.g., Maass & R. D. Clark, 1984). Similarly, high intensity (or low intensity) emotions may change other members' emotions. High intensity (or low intensity) emotions may be salient to group members, and therefore, be informative of the group's functioning. They may signal whether the group is doing well or not. Other group members may pick up on this signal and change their perspective accordingly, taking over the emotions of the member displaying the most (or least) intense emotions in their group.

In Chapter 5, I found that an individual's emotions at both extremes (very high and very low) of intensity influenced the emotions of other group members. As in other research (Baumeister et al., 2001; Peeters & Czapinsky, 1990), extremes containing negative information (high-intensity negative emotions or low-intensity positive emotions) were the best predictors of other group members' emotions. The reason for the disproportional influence of negative emotions may be that negative emotions have more informational value, as they diverge from the default positive experience in groups (Schwarz & Clore, 1983).

In sum, I found evidence for individual differences in the extent to which group members influence the emotions of other group members. More specifically, I found that the emotions of high-status group members and the emotions of group members experiencing the most or the least intense emotions in their group influence the emotions of other group members, once again underlining that the processes of emotional influence and convergence are selective.

Group identification

Finally, I was interested to know if the emotions of people who are invested in the group converged to the group average more than the emotions of people to whom the group was not central. Consistent with earlier research (e.g., Tanghe et al., 2010; Totterdell, 2000; Totterdell et al., 1998), I found in the first study of **Chapter 6** that the emotions of people who were identified with the group were more similar to the emotions of the rest of the group. In this study, I considered a broader range of emotions than used in previous research. Emotional fit was measured by profile correlations, which indicate the similarity between the emotional pattern of an individual group member and that of his/her group.

In the following two studies, I tried to understand the nature of the relationship between group identification and emotional fit by studying it over time. Although most previous research was cross-sectional and correlational in nature, it assumed that group identification would give rise to convergence (Tanghe et al., 2010; Totterdell, 2000; Totterdell et al., 1998). I argued and found that the opposite direction is equally plausible: Our two longitudinal studies show that the emotions of an individual who is highly identified with the group converge more to the group average than

the emotions of someone to whom the group is less central, but they also demonstrate that emotional similarity to the average group emotions leads individuals to subsequently identify more.

Role of positive or negative group climates. In Chapter 7, I discovered more about the reason why the emotions of highly identified individuals converge more to the group average. I tested two explanations for the emotional convergence of highly identified group members by comparing emotional convergence under positive circumstances with that under negative circumstances. One view would be that high group identifiers want to be similar to the group, and thus would converge as much under negative as under positive circumstances. The other explanation would be that high identifiers want to feel good about the group, because their self-view depends on it; in this case, they would converge with the (positive) group emotions under positive circumstances, but not with the (negative) group emotions under negative circumstances. In two studies, one longitudinal and one quasi-experimental study, I found evidence for the second explanation. Chapter 7 highlights the importance of taking into account the emotional climate of a group when studying processes of emotions in groups.

8.3. Theoretical Contributions

Emotion Theory

The findings of this dissertation speak to the social nature of emotions. By taking a longitudinal perspective, I was able to demonstrate that individuals' emotions evolve in connection with the emotions of other members of groups to which they belong. Group emotions do not simply

override the individual's emotions, as earlier researchers had it (e.g., Le Bon, 1896); rather, there is a continuous interaction between the individual's and the group's emotions. Group emotions emerge from the group members influencing each other's emotions. Individual emotions may also inform the emotion norms within a group, thus prescribing and constraining individual group members' emotions. In this sense, the idea that emotions are dynamic phenomena that unfold in social interactions, and that regulate these interactions (e.g., Butler, 2011; Fischer & Manstead, 2008; Fischer & Van Kleef, 2010; Parkinson et al., 2005), can also be applied to groups.

Taking a dynamic perspective on emotions in groups also allowed me to shed light on the conditions of emotional convergence within groups. My research suggests that processes of emotional influence in groups are selective. To start with, I found convergence on emotions that were relevant and applicable to other group members, but not on emotions that communicated information without shared importance. These findings are in line with the view on emotional convergence positing that interaction partners influence each other's emotions when these emotions are informative to interaction partners themselves, or to a situation that is of joint relevance to them (Elfenbein, 2014; Hess & Fischer, 2013; Moreland et al., 1996; Parkinson, 2011). In the case of groups, this means that the emotions should hold information on the group and its functioning, and thus should be of shared relevance to all group members, in order to converge. In this dissertation, I found emotional convergence for group pride, gratitude, and anger.

Although these emotions all provide information about task and relational aspects of functioning in groups, their routes to convergence may differ. Group pride has the group as a shared object, and may bring

about convergence via shared appraisals. For gratitude and anger, different processes may be at play. The gratitude and anger of a group member inform about whether group processes are evaluated as good or bad. When other group members agree with this perspective, they may take the same perspective, and this may lead to convergence (cf. convergent linkage; Elfenbein, 2014). When other group members do not take the same perspective, convergence may still take place via reactive emotions (cf. complementary linkage; Elfenbein, 2014).

Whereas the first contribution outlining that emotional convergence is a selective process applies the findings from dyadic research to small groups, the next two contributions specify phenomena that take place in groups only. More specifically, I found that emotional influence may depend on normative constraints. Concretely, emotion norms provide information about how group members ought to feel, and as such, regulate the interactions between group members. The existence of group norms on emotions may point to a way of regulating social relationships that is less present in dyads, presumably to deal with the more complex structure of relationships in groups (cf. Moreland, 2010). Emotion norms are not stable but they are contingent on the changes that groups go through, and thus adaptive to the specific context. In sum, group norms on emotions may regulate social relationships among group members, and may also be altered in the light of changes in groups.

Finally, members' level of group identification also plays a role in emotional influence processes in groups. More specifically, the emotions of high identifiers were more attuned to the emotions of the group than the emotions of low identifiers (at least in positive group contexts). As such, these findings contribute to the extant research on identity processes

in *intergroup* emotions by demonstrating that group identification is also important to *intra-group* emotional processes.

Group Psychology

The findings of this dissertation also contribute to the psychology of groups. First, by showing that group members interact with each other and influence each other over time, shaping and reshaping (emotional processes in) groups, my research contributes to the growing literature on emergent group identities (Jans et al., 2012; Meeussen et al., 2014; Postmes et al., 2005), and adds an emotional component to it: Emotions may be building blocks for what it means to be a group member. Therefore, my research complements the research on emotions as category-based feelings by showing that emotions can be constituents of a shared group identity, in addition to being the consequence of group identification.

Second, I contribute to the literature on group emotions that there is in-group heterogeneity in emotional influence. This contribution is meaningful against the background of a research domain that has operationalized the collective emotional experience of a group as a simple average of the individual group emotions (e.g., George, 1990; Totterdell et al., 1998), thus giving equal weight to every group member's emotions. I studied three different sources of within-group heterogeneity in emotional influence.

First, social status is linked to emotional influence: Emotions may thus be one channel through which high-status members exert influence on groups. Given that an emotion reflects a stance in the world, high-status members can be seen to communicate their view on the world through the emotions they experience and express, a view that is likely to be adopted

subsequently by the other group members when they become emotionally similar. That high-status group members' emotions disproportionally influence the emotions of the group suggests that they color the group's appraisals of events.

Second, emotional outliers have disproportional influence on the other group members. I found that the most or least intense emotion within a group predicts the emotions of other group members, above and beyond the median emotion. Common sense examples bring this finding alive: the one person not enjoying himself (i.e., not being happy) at the party is a party pooper; the fury of one team member may stir the anger of the whole team. It also resonates with other research on group dynamics, in particular the research on minority influence in groups. Minorities influence other group members when their message is strong. Emotions have been conceived as messages, and strong emotions (i.e., emotions that are either very intense or not intense at all, and that thus mark the extremes of the intensity distribution) appear to influence the emotions of other group members.

Third, heterogeneity was also found with respect to emotional adjustment. I studied individual differences in the propensity to be open to influence from other group members and proposed that high group identifiers would be more open to emotional influence from others than low group identifiers, leading to a stronger emotional fit for high as compared to low group identifiers. This hypothesis was confirmed by my research by showing a longitudinal association between group identification and emotional fit.

A third contribution to the group literature is the role of specific group emotions. In keeping with the literature on emotions within groups, I focused on positive emotions. However, I distinguished between several

types of positive group emotions, and investigated differential effects on group outcomes. I found that the specific information contained in the emotion helped to understand the group outcomes related to that emotion. The level of group gratitude, an emotion that signals the individual's valuing of another person (cf. Algoe et al., 2013; Algoe et al., 2010; Algoe et al., 2008), was related to relational outcomes; the level of group pride, an emotion that reflects the perceived glory of the group (Pekrun et al., 2009; Williams & DeSteno, 2008) was related to task outcomes. The specific emotions of a group thus provide a window on future group outcomes.

8.4. Applied Contributions

From the findings of this dissertation, a number of practical recommendations can be formulated. To start with, the insights that were gained by investigating selective emotional influence can be used by practitioners to facilitate or hinder emotional convergence in groups. First, given that (perceived) group norms on emotions guide group members' emotional experience, it may be advisable to set group norms for the expression of desired emotions and for the suppression of undesired emotions. This norm setting may be explicit or implicit. Emotion norms may be formally reinforced by written rules. For instance, police officers may have a code of conduct to be neutral and not show anger. Alternatively, emotion norms may be more implicitly communicated through formal or informal leaders within a group. For instance, in work groups, a group leader may interfere in a discussion between group members, signaling that it is not okay to be angry. Group norms on emotions may also be built from the bottom up, by allowing group

members to discuss and contribute ideas about what their ideal group should look like.

Second, formal or informal leaders of a group, given that their emotional experience impacts the emotional experience of other group members, may also strategically display or downregulate specific emotions to alter the emotional experience of their group. For instance, if the group leader is not happy with the group's performance, (s)he may openly express his/her shame to other group members to evoke shame in them and to signal that they should perform better. Indeed, recent research has suggested that people use emotion regulation strategies not only to regulate their own emotions, but also the emotions of their interaction partners (Netzer, Van Kleef, & Tamir, 2105; Niven, Garcia, van de Löwe, Holman, & Mansell, 2015; Niven, Totterdell, & Holman, 2009).

Third, given that the content of the emotions also determines whether or not they become shared among group members, practitioners may try to change this content, and make emotions that benefit group functioning relevant and meaningful for the group, while downplaying the group-relevance of emotions that harm group functioning. For instance, when one group member of a work group accomplishes an achievement, this may be framed in terms of a gain for the group, making all other members feel pride as well, and motivated to sustain efforts.

Furthermore, the insights that were gained by studying the link between group identification and emotional fit may also be used to by practitioners. In Chapter 6, I found a positive, mutual relationship between group identification and emotional fit over time, such that they mutually reinforce or dampen each other over time. Group interventions that improve either group identification or emotional fit may promote positive group outcomes.

On the one hand, group interventions may focus on strengthening group members' identification. Previous research has shown that group members identify more strongly with their group after personally contributing to their group's identity (Jans et al., 2012; Meeussen et al., 2014; Swaab et al., 2008). An intervention including all group members, aiming at jointly building a group identity (cf. "an inductive route to social identity formation", Jans et al., 2012) would be one way to increase members' group identification. One consideration that should be made here is that this strategy may work best in groups that are characterized by a positive climate. In groups that are characterized by a negative climate, high identifiers do experience higher levels of positive emotions (cf. Chapter 7) and thus have the potential to boost the group's morale, but it is less clear what would happen to them in the long run. It may be that, after some time, high identifiers give in and adjust their emotions to those the group, resulting in higher levels of negative emotions for them too. Alternatively, they may disengage from their group. Both of these options limit the positive contribution of high identifiers to group functioning in the long run.

On the other hand, group interventions may focus on elevating group members' emotional fit. One way to increase emotional fit would be by facilitating discussion among group members about the meaning of emotional events. We hereby think of a framework like the one provided by H. H. Clark and Wilkes-Gibbs (1986), in which interaction partners took turns communicating about ambiguous stimuli until they reached a common understanding of the stimuli. During this process, and throughout different interaction turns, partners increasingly reached agreement on the meaning of stimuli. Similarly, exercises where group members discuss emotional scenarios with the aim of reaching a common

understanding of the situation may improve the process of emotional appraisal, thus increasing emotional fit. Again, this strategy should be best employed in groups characterized by a positive climate. In groups with a negative climate, emotional fit would entail experiencing higher levels of negative emotions, which may not (always) be beneficial for individual and group outcomes.

8.5. Limitations and Future Directions

The studies described in this dissertation are not without their limitations, as it is the case for all research. In the next paragraphs, I will address some general limitations that span across multiple studies. In addition, I will discuss possible paths for future research that emerge from the limitations of my research and from the new questions that have arisen from my research.

First, the longitudinal studies in this dissertation followed task groups from the beginning of the collaboration until the groups dissolved. The advantage of the use of newly formed groups is that it gives unique insights into the development of groups. However, group processes may differ depending on how long the groups have existed. The one study in this dissertation that investigated established teams found no different relationship between group identification and emotional fit in those teams as compared to newly formed groups, but this study was cross-sectional in nature. Therefore, it may be interesting to see whether similar processes are at play when groups have been in place for a longer time.

Second, the boundaries of the groups were not malleable in our studies; individuals were not able to change groups over time. It may be interesting to investigate processes of emotional convergence in groups

where membership is more negotiable to the individual members. For instance, organizational research on mergers shows changes in the affect networks (Totterdell, Wall, Holman, Diamond, & Epitropaki, 2004). It would be interesting to study systematically how dynamic changes in group composition affect processes of emotional influence and emotional convergence.

Third, it may be interesting to study work groups within the larger socio-cultural context in which they are embedded (Van Kleef & Fischer, 2015). In this dissertation, we did not take into account factors that were beyond the group-level. However, groups are not isolated islands, but they cooperate or compete with other groups, they are part of a larger cultural context, etc. Although methodologically challenging, studying emotional processes within groups, while taking into account the larger socio-cultural context, may provide a more complete picture on how emotions work in social life.

Fourth, the groups under study in this dissertation were relatively homogeneous. The majority of the psychology students were female and they were all about the same age. The majority of the engineering students were male; they were more diverse in terms of ethnic distribution and age. However, in both samples, the common identity of students in a project may have been more salient than other social identities, such as ethnicity or age group. Future research may look into processes of emotional convergence in diverse groups, in which the differences in social identities are foregrounded, and the common group identity is less pronounced. Several existing studies suggest that processes of emotional convergence may in fact be very different in high–diversity groups. Depending on the social identity activated, group members have been shown to experience different emotions (Ray et al., 2008). These different emotions in turn may

lead to emotional divergence rather than to emotional convergence (Garcia-Prieto, Mackie, Tran, & E. R. Smith, 2007).

Fifth, an increasing number of organizations depend on virtual teams. Future research should investigate emotional convergence in this type of teams. Based on big data research, I expect that emotional convergence is not dependent on physical presence. For instance, a study on Facebook showed that manipulating the valence of news feeds led to same-valence responses throughout the friend-network: Positive news feeds were followed by more positive and fewer negative responses, whereas the opposite was true for negative news feeds (A. D. I. Kramer, Guillory, & Hancock, 2014). In research with virtual teams that were formed in the lab, team members' emotions converged towards an angry or happy confederate; anger and happiness were manipulated by means of text-based messages. Participants themselves also sent more negative messages in the "angry confederate"- as compared to the "happy confederate"-condition, whereas they sent more positive messages in the "happy confederate"- as compared to the "angry confederate"-condition (Cheshin, A. Rafaeli, & Bos, 2011). Thus, although some first steps are taken, future research may follow up on these studies and investigate emotional convergence in "real" virtual teams over time.

Sixth, although some of my studies were longitudinal in nature, the time intervals in between the measurements were quite large (at least one week in between two measurement points). Research using shorter time intervals between measurements may provide more insights into the micro-processes of emotional convergence (cf. Parkinson & Manstead, 2015). To this aim, researchers may use daily diary studies (Bolger, Davis, & E. Rafaeli, 2003) or experience sampling methods (Csikszentmihalyi & Larson, 1987). For instance, Miner, Glomb and Hulin (2005) used

experience sampling methods to study within-person variation in the moods of different employees of an organization. Experience sampling and daily diary methods may thus be used not only to study the emotions of individual group members in isolation, but also to study group processes when all members of a group report on their emotions simultaneously.

Seventh, in my research, it was not possible to disentangle processes of convergent affective linkage (through shared appraisals) and complementary affective linkage (through reactive emotions; Elfenbein, 2014), because I didn't study group members' appraisals. For group pride, convergent linkage is most likely, because the object of group pride is shared among group members. However, for gratitude and anger, both processes of convergent and complementary linkage may take place. The gratitude and anger of a group member may either bring about a shared perspective in other members, or elicit reactive gratitude or anger in others. Future research may explicitly target group members' appraisals to investigate which type of linkage occurs.

Eighth, in line with previous research, I linked group-level emotions with group-level outcomes. However, it is not clear what it is that makes group-level emotions predict group-level outcomes. Do they predict outcomes because there is emotional similarity between group members, do they predict outcomes because of their intensity level, or does the interplay between both play a role? Future research may aim to disentangle the contributions of these different factors by studying the effect of emotional similarity and intensity level simultaneously.

Ninth, I mainly focused on the consequences of positive group emotions (cf. gratitude and group pride) for group functioning, and found that positive emotions benefit group functioning in my research. The story

for negative emotions is more complex. Extant research has shown that similarity in negative emotions often results in poor outcomes (e.g., Duffy & Shaw, 2000; George, 1990; Sy et al., 2005), but in a recent meta-analysis, Knight and Eisenkraft (2015) identified some conditions in which similarity in negative affect may actually benefit groups. This is the case when group members do not have to collaborate anymore in the future, thus when no long-term relationships can be harmed, or when the emotions are directed at an external source, rather than at a source within the group. When negative emotions are directed at an external source, and group members are thus allies against a common enemy, this bonding may benefit group functioning. However, when emotions are directed at sources within a group, conflicts may escalate, not only harming group relations, but also group performance. Knowing whether emotional convergence results from convergent or complementary linkage may already shed some light on whether negative emotions will benefit or harm group functioning. In addition, there may also be other factors at play, such as the type of emotion and the type of outcome under study.

Tenth, research on emotional convergence in groups may also benefit from combining self-reports with physiological reports. As such, researchers may study whether there is also convergence in the physiological patterns of different group members. Research has provided evidence for physiological linkage in dyadic relations. For instance, Levenson and Gottman (1983) have shown that romantic couples showed physiological linkage when discussing conflict situations. In addition, physiological linkage has also been demonstrated in therapist-client relationships, and this was linked to therapists' level of empathy (Marci, Ham, Moran, & Orr, 2007). Building on this research in dyadic relations, future research may investigate whether physiological linkage occurs

between members of groups, and whether there is overlap between physiological linkage and linkage of emotional experience.

Finally, future research on emotional convergence should continue to use (longitudinal) social network analysis, like in my research. A major advantage of the use of (longitudinal) social network analysis is that it can test for influence effects (i.c., Do group members adjust their emotions towards those group members they are connected with?), while controlling for selection effects (i.c., Do group members become connected to other group members who show similar emotions?). In addition, by simultaneously testing influence and selection effects, the direction of the effect can be determined. In a, to my knowledge, first use of social network analysis in research on emotional spread in groups, Totterdell and his colleagues (2004) showed that interactive work groups showed convergence of affect, and that affect was transferred between members who were connected to each other through work ties (i.e., who had to interact together in order to complete their work). Social network analysis has also been used to show transfer of affect in larger groups. For instance, Fowler and Christakis (2008) found that a person's happiness could be predicted by the happiness of the people with whom this person formed ties. Similarly, A. D. I. Kramer and colleagues (2014) found evidence for emotional spread between Facebook friends. In my research, I have studied whether emotional spread was facilitated through high-status members, but it offers many other research opportunities. For instance, it can also be tested whether emotional convergence occurs via group members that like each other (cf. Fowler & Christakis, 2008; A. D. I. Kramer et al., 2014). Furthermore, it may also be interesting to test whether different types of networks show differences in emotional convergence. For instance, is there more convergence in denser networks

as compared to less dense networks? Or, is convergence in groups hindered when subgroups have emerged? Effects at the level of the networks may also reflect aspects of the larger social context (cf. supra).

8.6. Conclusion

Whereas extant research has shown that group members show similarity of affect, moods, and emotions, less is known about how this emotional similarity comes about. This dissertation addresses this research gap by studying emotional convergence in groups over time. My research has shown that, over time, the emotions of group members become more similar, and it has highlighted some of the conditions and consequences of emotional convergence. I found that (a) emotional convergence is facilitated by group norms on emotions, and (b) there is more emotional convergence of emotions that provide information relevant to all group members. My research suggests, therefore, that emotional convergence depends on the specific nature of the emotion, and cannot be predicted on the basis of the valence of the emotion alone. Similarly, I found that group outcomes can be better understood from the precise nature of the group emotions than would be possible based on valence alone. Finally, there are individual differences in emotional influence and adjustment within groups: Status, extremity of emotional intensity, and group identification were all relevant predictors of emotional influence and adjustment. Together, my studies contribute to the growing literature on the social nature of emotions, and show that emotions play an important role in the emergence and dynamics of groups.

Appendix



A.1. Supplementary tables of Chapter 2

Table A.1 Intercorrelations between all variables for anger

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Ind ang exp - W2	.42***	.21***	.06	.46***	.28***	**.16****	**.11**†	.36***	.11†	.18**	-.02	.24***	.03	.19**	-.02
2. Ind ang norm - W2	-	.07	.22***	.24***	.49***	.10†	.13*	.15*	.11†	.35***	.02	.19**	.13*	.33***	.07
3. Gr ang exp - W2		-	.43***	**.14***	.08	.49***	**.31*****	.10	.34***	-.02	.12†	.05	.20**	-.04	.13*
4. Gr ang norm - W2			-	**.10**	.13*	**.31****	.53***	.11†	.22***	.05	.28***	.16*	.27***	.04	.34***
5. Ind ang exp - W4				-	.46***	.23***	.16**	.56***	.30***	**.25*****	**.11**†	.43***	.23***	.26***	.17**
6. Ind ang norm - W4					-	.15	.08	.30***	.43***	.16*	.13*	.25***	.44***	.20**	.08
7. Gr ang exp - W4						-	.58***	**.29*****	.12*	.68***	**.39*****	.30***	.12†	.54***	.30***
8. Gr ang norm - W4							-	**.20****	.13*	**.42*****	.51***	.28***	.07	.45***	.45***
9. Ind ang exp - W10								-	.44***	.34***	.19**	.66***	.36***	**.33*****	**.19****
10. Ind ang norm - W10									-	.18**	.07	.35***	.68***	.22***	.10
11. Gr ang exp - W10										-	.56***	**.35*****	.13*	.70***	**.43*****
12. Gr ang norm - W10											-	**.26*****	.07	**.46*****	.64***
13. Ind ang exp - W13												-	.48***	.49***	.31***
14. Ind ang norm - W13													-	.25***	.10
15. Gr ang exp - W13														-	.61***
16. Gr ang norm - W13															-

Note. Ind = individual, gr = group, ang = anger, exp = experience. † p < .10, * p < .05, ** p < .01, *** p < .001. The bold numbers represent the intercorrelations between the variables tested in the cross-lagged models.

Table A.2 Intercorrelations between all variables for gratitude

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Ind grat exp - W2	.37***	.11†	.04	.47***	.25***	**.20****	**.13***	.32***	.21**	-.17**	.10	.38***	.18**	.17**	.11†
2. Ind grat norm - W2	-	.04	.05	.27***	.47***	.07	.01	.17**	.06	.38***	.00	.16**	.08	.31***	.07
3. Gr grat exp - W2		-	.35***	**.20****	.09	.57***	**.34*****	.25***	.51***	.08	.21**	.25***	.46***	.09	.19**
4. Gr grat norm - W2			-	**.10**	-.01	**.28*****	.40***	.08	.19**	-.01	.35***	.07	.16*	.04	.27***
5. Ind grat exp - W4				-	.48***	.23***	.15*	.42***	.25***	**.17****	**.09**	.45***	.29***	.16*	.08
6. Ind grat norm - W4					-	.14*	.02	.27***	.45***	.07	.09	.22***	.43***	.06	.07
7. Gr grat exp - W4						-	.58***	**.20****	.10	.54***	**.30*****	.22***	.11	.56***	.34***
8. Gr grat norm - W4							-	**.09**	.10	**.36*****	.46***	.10	.07	.35***	.44***
9. Ind grat exp - W10								-	.35***	.27***	.09	.64***	.35***	**.32*****	**.21****
10. Ind grat norm - W10									-	.08	.15*	.30***	.54***	.12†	.18**
11. Gr grat exp - W10										-	.36***	**.34*****	.18**	.74***	**.45*****
12. Gr grat norm - W10											-	**.12**†	.18**	**.34*****	.61***
13. Ind grat exp - W13												-	.45***	.32***	.22***
14. Ind grat norm - W13													-	.20**	.23***
15. Gr grat exp - W13														-	.55***
16. Gr grat norm - W13															-

Note. Ind = individual, gr = group, grat = gratitude, exp = experience, † p < .10, * p <.05, ** p < .01, *** p < .001. The bold numbers represent the correlations between the variables tested in the cross-lagged models.

Table A.3 Predictions of the cross-lagged model for the mutual relationship between individual anger norms and individual anger experience

	Stand. β	SE β	p-value
Control effects			
Age → Anger norm W2	0.10	0.08	.19
Age → Anger norm W4	0.01	0.07	.93
Age → Anger norm W10	0.06	0.06	.27
Age → Anger norm W13	-0.02	0.05	.68
Age → Anger exp W2	*0.09*	*0.05*	*.07*
Age → Anger exp W4	0.02	0.08	.78
Age → Anger exp W10	0.04	0.06	.50
Age → Anger exp W13	0.02	0.05	.71
Gender → Anger norm W2	0.03	0.08	.34
Gender → Anger norm W4	0.06	0.04	.12
Gender → Anger norm W10	-0.03	0.06	.57
Gender → Anger norm W13	-0.05	0.06	.34
Gender → Anger exp W2	0.09	0.06	.11
Gender → Anger exp W4	-0.01	0.06	.89
Gender → Anger exp W10	-0.07	0.06	.24
Gender → Anger exp W13	-0.07	0.05	.13
# friends → Anger norm W2	-0.04	0.06	.49
# friends → Anger norm W4	0.01	0.05	.81
# friends → Anger norm W10	0.09	0.06	.13
# friends → Anger norm W13	-0.02	0.05	.71
# friends → Anger exp W2	-0.07	0.07	.29
# friends → Anger exp W4	0.06	0.06	.33
# friends → Anger exp W10	**0.15**	**0.06**	**.01**
# friends → Anger exp W13	*-0.11*	*0.06*	*.08*

Stability paths			
Anger norm W2 → W4	**0.45**	**0.05**	**<.001**
Anger norm W4 → W10	**0.38**	**0.06**	**<.001**
Anger norm W10 → W13	**0.63**	**0.04**	**<.001**
Anger exp W2 → W4	**0.43**	*0.05*	**<.001**
Anger exp W4 → W10	**0.52**	**0.04**	**<.001**
Anger exp W10 → W13	**0.65**	**0.04**	**<.001**
Within-time associations			
Anger norm ↔ exp W2	**0.42**	**0.06**	**<.001**
Anger norm ↔ exp W4	**0.40**	**0.06**	**<.001**
Anger norm ↔ exp W10	**0.34**	**0.08**	**<.001**
Anger norm ↔ exp W13	**0.36**	*0.05*	**<.001**
Cross-lagged associations			
Anger norm W2 → anger exp W4	**0.08**	**0.02**	**<.001**
Anger norm W4 → anger exp W10	**0.06**	**0.02**	**.001**
Anger norm W10 → anger exp W13	**0.07**	**0.02**	**.001**
Anger exp W2 → anger norm W4	**0.10**	**0.03**	**<.001**
Anger exp W4 → anger norm W10	**0.10**	**0.03**	**<.001**
Anger exp W10 → anger norm W13	**0.12**	**0.03**	**<.001**

Note. Lines in boldface represent significant effects (p<.05); lines in italic represent marginal effects (p<.10).

Table A.4 Predictions of the cross-lagged model for the mutual relationship between individual gratitude norms and individual gratitude experience

	Stand. β	SE β	p-value
Control effects			
Age → Grat norm W2	0.01	0.06	.91
Age → Grat norm W4	-0.05	0.05	.37
Age → Grat norm W10	-0.04	0.05	.46
Age → Grat norm W13	-0.03	0.04	.57
Age → Grat exp W2	-0.10	0.06	.12
Age → Grat exp W4	-0.05	0.06	.39
Age → Grat exp W10	-0.00	0.06	.96
Age → Grat exp W13	-0.07	0.05	.16
Gender → Grat norm W2	-0.03	0.05	.64
Gender → Grat norm W4	0.01	0.06	.92
Gender → Grat norm W10	*0.11*	*0.07*	*.10*
Gender → Grat norm W13	*0.09*	*0.05*	*.09*
Gender → Grat exp W2	-0.07	0.06	.21
Gender → Grat exp W4	-0.04	0.05	.41
Gender → Grat exp W10	0.01	0.05	.79
Gender → Grat exp W13	-0.01	0.06	.86
# friends → Grat norm W2	**0.12**	**0.05**	**.01**
# friends → Grat norm W4	0.03	0.04	.48
# friends → Grat norm W10	*-0.10*	*0.05*	*.06*
# friends → Grat norm W13	**0.09**	**0.05**	**.05**
# friends → Grat exp W2	**0.17**	**0.05**	**.002**
# friends → Grat exp W4	-0.02	0.06	.71
# friends → Grat exp W10	0.09	0.06	.12
# friends → Grat exp W13	0.03	0.04	.45

Stability paths			
Grat norm W2 → W4	**0.43**	**0.06**	**<.001**
Grat norm W4 → W10	**0.40**	*0.05*	**<.001**
Grat norm W10 → W13	**0.49**	*0.05*	**<.001**
Grat exp W2 → W4	*0.45*	*0.05*	**<.001**
Grat exp W4 → W10	**0.40**	**0.06**	**<.001**
Grat exp W10 → W13	**0.61**	*0.05*	**<.001**
Within-time associations			
Grat norm ↔ exp W2	*0.35*	**0.07**	**<.001**
Grat norm ↔ exp W4	**0.42**	**0.06**	**<.001**
Grat norm ↔ exp W10	**0.28**	**0.06**	**<.001**
Grat norm ↔ exp W13	**0.30**	**0.06**	**<.001**
Cross-lagged associations			
Grat norm W2 → Grat exp W4	**0.09**	**0.02**	**<.001**
Grat norm W4 → Grat exp W10	**0.08**	**0.02**	**<.001**
Grat norm W10 → Grat exp W13	**0.08**	**0.02**	**<.001**
Grat exp W2 → Grat norm W4	**0.11**	**0.03**	**<.001**
Grat exp W4 → Grat norm W10	**0.11**	**0.03**	**<.001**
Grat exp W10 → Grat norm W13	**0.11**	**0.03**	**<.001**

Note. Lines in boldface represent significant effects (p<.05); lines in italic represent marginal effects (p<.10).

Table A.5 Predictions of the cross-lagged model for the mutual relationship between group anger norms, group anger experience and individual anger experience

	Stand. β	SE β	p-value
Control effects			
Age → Ind anger exp W2	*0.09*	*0.05*	*.07*
Age → Ind anger exp W4	0.03	0.07	.68
Age → Ind anger exp W10	0.04	0.05	.45
Age → Ind anger exp W13	0.02	0.05	.66
Gender → Ind anger exp W2	*0.09*	*0.05*	*.09*
Gender → Ind anger exp W4	-0.02	0.06	.74
Gender → Ind anger exp W10	-0.07	0.06	.21
Gender → Ind anger exp T4	-0.05	0.04	.21
# friends → Ind anger exp W2	-0.07	0.07	.31
# friends → Ind anger exp W4	0.05	0.05	.30
# friends → Ind anger exp W10	**0.13**	**0.05**	**.01**
# friends → Ind anger exp W13	*-0.08*	*0.04*	*.06*
Stability paths			
Gr anger norm W2 → W4	**0.48**	**0.06**	**<.001**
Gr anger norm W4 → W10	**0.44**	**0.06**	**<.001**
Gr anger norm W10 → W13	**0.54**	**0.06**	**<.001**
Gr anger exp W2 → W4	**0.43**	**0.07**	**<.001**
Gr anger exp W4 → W10	**0.62**	**0.05**	**<.001**
Gr anger exp W10 → W13	**0.62**	**0.05**	**<.001**
Ind anger exp W2 → W4	**0.45**	**0.05**	**<.001**
Ind anger exp W4 → W10	**0.54**	**0.04**	**<.001**
Ind anger exp W10 → W13	**0.65**	**0.04**	**<.001**

Within-time associations			
Gr anger norm ↔ gr exp W2	**0.42**	**0.09**	**<.001**
Gr anger norm ↔ gr exp W4	**0.53**	**0.08**	**<.001**
Gr anger norm ↔ gr exp W10	**0.44**	**0.09**	**<.001**
Gr anger norm ↔ gr exp W13	**0.49**	**0.07**	**<.001**
Gr anger norm ↔ ind exp W2	0.05	0.07	.43
Gr anger norm ↔ ind exp W4	0.09	0.07	.23
Gr anger norm ↔ ind exp W10	0.09	0.07	.18
Gr anger norm ↔ ind exp W13	**0.17**	**0.07**	**.04**
Gr anger exp ↔ ind exp W2	**0.20**	**0.09**	**.03**
Gr anger exp ↔ ind exp W4	**0.17**	**0.07**	**.02**
Gr anger exp ↔ ind exp W10	*0.15*	*0.09*	*.08*
Gr anger exp ↔ ind exp W13	**0.33**	**0.08**	**<.001**
Cross-lagged associations			
Gr anger norm W2 → gr exp W4	**0.08**	**0.03**	**.01**
Gr anger norm W4 → gr exp W10	**0.06**	**0.02**	**.01**
Gr anger norm W10 → gr exp W13	**0.06**	**0.02**	**.01**
Gr anger norm W2 → ind exp W4	**0.02**	**0.01**	**.03**
Gr anger norm W4 → ind exp W10	**0.02**	**0.01**	**.03**
Gr anger norm W10 → ind exp W13	**0.02**	**0.01**	**.03**
Gr anger exp W2 → ind exp W4	**0.06**	**0.02**	**<.001**
Gr anger exp W4 → ind exp W10	**0.06**	**0.02**	**<.001**
Gr anger exp W10 → gr norm W13	**0.07**	**0.02**	**<.001**
Gr anger exp W2 → gr norm W4	**0.10**	**0.04**	**.01**
Gr anger exp W4 → gr norm W10	**0.10**	**0.03**	**.004**
Gr anger exp W10 → gr norm W13	**0.13**	**0.04**	**.004**
Ind anger exp W2 → gr norm W4	**0.07**	**0.03**	**.02**
Ind anger exp W4 → gr norm W10	**0.06**	**0.03**	**.02**
Ind anger exp W10 → gr norm W13	**0.08**	**0.03**	**.02**
Ind anger exp W2 → gr exp W4	**0.14**	**0.03**	**<.001**

Ind anger exp W4 → gr exp W10	**0.11**	**0.03**	**<.001**
Ind anger exp W10 → gr exp W13	**0.12**	**0.03**	**<.001**

Note. Lines in boldface represent significant effects (p<.05); lines in italic represent marginal effects (p<.10).

Table A.6 Predictions of the cross-lagged model for the mutual relationship between group gratitude norms, group gratitude experience and individual gratitude experience

	Stand. β	SE β	p-value
Control effects			
Age → Ind grat exp W2	-0.10	0.06	.11
Age → Ind grat exp W4	-0.05	0.06	.37
Age → Ind grat exp W10	-0.01	0.05	.84
Age → Ind grat exp W13	-0.07	0.05	.14
Gender → Ind grat exp W2	-0.08	0.06	.19
Gender → Ind grat exp W4	-0.04	0.05	.45
Gender → Ind grat exp W10	0.02	0.05	.72
Gender → Ind grat exp W13	-0.00	0.06	.96
# friends → Ind grat exp W2	**0.17**	**0.05**	**.002**
# friends → Ind grat exp W4	-0.02	0.06	.79
# friends → Ind grat exp W10	0.06	0.05	.20
# friends → Ind grat exp W13	0.01	0.04	.78
Stability paths			
Gr grat norm W2 → W4	**0.35**	**0.08**	**<.001**
Gr grat norm W4 → W10	**0.36**	**0.07**	**<.001**
Gr grat norm W10 → W13	**0.56**	**0.05**	**<.001**

Gr grat exp W2 → W4	0.50	0.05	<.001
Gr grat exp W4 → W10	0.46	0.05	<.001
Gr grat exp W10 → W13	0.66	0.04	<.001
Ind grat exp W2 → W4	0.46	0.05	<.001
Ind grat exp W4 → W10	0.42	0.06	<.001
Ind grat exp W10 → W13	0.62	0.05	<.001
Within-time associations			
Gr grat norm ↔ gr exp W2	0.34	0.10	.001
Gr grat norm ↔ gr exp W4	0.48	0.07	<.001
Gr grat norm ↔ gr exp W10	0.24	0.10	.02
Gr grat norm ↔ gr exp W13	0.34	0.08	<.001
Gr grat norm ↔ ind exp W2	0.01	0.06	.87
Gr grat norm ↔ ind exp W4	0.03	0.07	.62
Gr grat norm ↔ ind exp W10	0.03	0.07	.66
Gr grat norm ↔ ind exp W13	0.03	0.07	.66
Gr grat exp ↔ ind exp W2	0.09	0.09	.29
Gr grat exp ↔ ind exp W4	0.07	0.09	.47
Gr grat exp ↔ ind exp W10	0.16	0.08	.03
Gr grat exp ↔ ind exp W13	0.01	0.10	.91
Cross-lagged associations			
Gr grat norm W2 → gr exp W4	0.12	0.03	<.001
Gr grat norm W4 → gr exp W10	0.10	0.02	<.001
Gr grat norm W10 → gr exp W13	0.11	0.02	<.001
Gr grat norm W2 → ind exp W4	0.03	0.01	.01
Gr grat norm W4 → ind exp W10	0.02	0.01	.01
Gr grat norm W10 → ind exp W13	0.03	0.01	.01
Gr grat exp W2 → ind exp W4	0.07	0.02	<.001
Gr grat exp W4 → ind exp W10	0.06	0.02	<.001
Gr grat exp W10 → ind exp W13	0.06	0.02	<.001
Gr grat exp W2 → gr norm W4	0.17	0.04	<.001

Gr grat exp W4 → gr norm W10	**0.16**	**0.04**	**<.001**
Gr grat exp W10 → gr norm W13	**0.17**	**0.04**	**<.001**
Ind grat exp W2 → gr norm W4	**0.09**	**0.03**	**.004**
Ind grat exp W4 → gr norm W10	**0.08**	**0.03**	**.003**
Ind grat exp W10 → gr norm W13	**0.08**	**0.03**	**.002**
Ind grat exp W2 → gr exp W4	**0.16**	**0.04**	**<.001**
Ind grat exp W4 → gr exp W10	**0.13**	**0.03**	**<.001**
Ind grat exp W10 → gr exp W13	**0.14**	**0.03**	**<.001**

Note. Lines in boldface represent significant effects ($p<.05$); lines in italic represent marginal effects ($p<.10$).

A.2. Supplementary tables of Chapter 3(bis)

Table A.7 Intercorrelations between all variables for Study 1

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Ind self-pride – W2	.45***	.13*	.15*	.53***	.38***	**.08**	.13*	.30***	.09	-.07	.00	.32***	.19**	.06	.00
2. Ind group pride – W2	-	.17**	.36***	.26***	.61***	.10	**.23*****	.25***	.34***	.03	.19**	.24***	.42***	.10	.17**
3. Gr self-pride – W2		-	.50***	**.07**	.13*	.55***	.41***	-.05	.06	.21***	.16*	.05	.06	.35***	.21***
4. Gr group pride – W2			-	.07	**.23*****	.25***	.60***	.04	.20**	.26***	.40***	.06	.20**	.25***	.39***
5. Ind self-pride – W4				-	.52***	-.00	.12*	.46***	.22***	**-.03**	.01	.47***	.19**	.05	-.01
6. Ind group pride – W4					-	.14*	.21***	.38***	.47***	.10	**.18****	.30***	.45***	.18**	.14*
7. Gr self-pride – W4						-	.61***	**.01**	.09	.45***	.31***	-.00	.02	.39***	.19**
8. Gr group pride – W4							-	.11	**.22*****	.43***	.53***	.14*	.18**	.35***	.48***
9. Ind self-pride – W10								-	.41***	.06	.14*	.48***	.21**	**.09**	.18**
10. Ind group pride – W10									-	.16**	.35***	.28***	.63***	.14*	**.36*****
11. Gr self-pride – W10										-	.52***	**.05**	.19**	.49***	.35***
12. Gr group pride – W10											-	.08	**.36*****	.33***	.69***
13. Ind self-pride – W13												-	.34***	.01	.14*
14. Ind group pride – W13													-	.18**	.49***
15. Gr self-pride – W13														-	.39***
16. Gr group pride – W13															-

Note. Ind = individual's, gr = group's. * p <.05, ** p < .01, *** p < .001. The bold numbers represent the correlations between the variables tested in the cross-lagged models.

Table A.8 Intercorrelations between all variables for Study 2

	2	3	4	5	6
1. Self-pride – W7	.44***	.48***	.08	.29***	.12
2. Group-pride – W7	-	.21**	.23**	.21**	.24**
3. Self-pride – W21		-	.37***	.37***	.14†
4. Group-pride – W21			-	.14†	.41***
5. Self-pride – W24				-	.36***
6. Group-pride – W24					-

Note. † p <.10, ** p < .01, *** p < .001.

Table A.9 Description of the effects tested in the network model (part 1)

Nr.	Effect	Network parameter	Description
Effect of interest:			
1	The spread of pride through influence ties	Behavior pride average alter	Does the pride of a group member who is perceived as influential by another group member, predicts the pride of that other group member?
Controls:			
2	Influence rating intercept	Outdegree	Do group members form many ties with other group members?
3	Agreement in influence ratings	Indegree popularity (sqrt)	Do group members agree on who is influential within their group?
4	Influence rating change (period 1)	Constant tie rate (period 1)	Is there a change in influence ties between week 7 and week 21?
5	Influence rating change (period 2)	Constant tie rate (period 2)	Is there a change in influence ties between week 21 and week 24?
6	Pride change (period 1)	Rate pride (period 1)	Is there a change in the pride levels between week 7 and week 21?
7	Pride change (period 2)	Rate pride (period 2)	Is there a change in the pride levels between week 21 and week 24?
8	Pride when rated as influential by many others	Behavior pride indegree	Do group members who are evaluated as influential by many other group members experience more (or less) pride?

Table A.9 Description of the effects tested in the network model (part 2)

Nr.	Effect	Network parameter	Description
9	Proud members' ratings of others' influence	Pride ego	Do group members with higher (or lower) levels of pride evaluate more other group members as influential?
10	Influence rating reciprocity	Reciprocity	Do group members reciprocate influence ties?
11	Transitive triplets	Transitive triplets	If member A evaluates member B as influential and member B evaluates member C as influential, does person A evaluate member C as influential?
12	3-cycles	3-cycles	If member B evaluates member C as influential and member C evaluates member A as influential, does member A evaluate member B as influential?
13	Influence when rating others as influential	Outdegree popularity (sqrt)	Are group members who evaluate more other group members as influential perceived as more influential by other group members?
14	Pride when rating many others as influential	Behavior pride outdegree	Do members who evaluate more other members as influential have higher levels of pride?
15	Others' influence ratings of proud members	Pride alter	Are members with higher levels of pride evaluated as more influential by other group members?
16	Seeing members with similar pride as influential	Pride similarity	Do group members with similar levels of pride evaluate each other as more influential than group members with dissimilar levels of pride?

Table A.9 Description of the effects tested in the network model (part 3)

Nr.		Network parameter	Description
17	Linear change in pride	Behavior pride linear shape	Is there a tendency for a linear change in the levels of pride in the overall network?
18	General convergence or divergence in pride	Behavior pride quadratic shape	Is there a tendency for a quadratic change in the levels of pride in the overall network?
19	Leader's higher influence	Leader alter	Are leaders evaluated as more influential than other group members?
20	Leaders perceiving more others as influential	Leader ego	Do leaders evaluate more other group members as influential than other group members?
21	Different pride changes for leaders	Behavior pride effect from leader	Do leaders have a higher tendency to change their levels of pride as compared to other group members?
22	Women's higher influence	Gender alter	Are women evaluated as more influential than men?
23	Women perceiving more others as influential	Gender ego	Do women evaluate more other group members as influential than men?
24	Seeing members with similar gender as influential	Gender similarity	Do women (men) evaluate more other women (men) as influential than men (women)?
25	Different pride changes for women	Behavior pride effect from gender	Do women have a higher tendency to change their levels of pride as compared to other group members?

Table A.10 Estimations and standard errors tested in the network model for self-pride and group pride

Nr.	Effect	Self-pride	Group pride
Effect of interest:			
1	The spread of pride through influence ties	0.38 (0.25)	0.68 (0.19) ***
Controls:			
2	Influence rating intercept	-2.59 (0.52) ***	-2.46 (0.60) ***
3	Agreement in influence ratings	1.11 (0.14) ***	1.09 (0.15) ***
4	Influence rating change (period 1)	4.29 (0.52) ***	4.44 (0.50) ***
5	Influence rating change (period 2)	2.89 (0.29) ***	3.03 (0.33) ***
6	Pride change (period 1)	1.45 (0.20) ***	2.89 (0.69) ***
7	Pride change (period 2)	2.09 (0.38) ***	2.49 (0.47) ***
8	Pride when rated as influential by many others	0.00 (0.05)	-0.12 (0.05) *
9	Proud members' ratings of others' influence	0.15 (0.10)	0.24 (0.12) *
10	Influence rating reciprocity	0.30 (0.23)	0.43 (0.23) †
11	Transitive triplets	0.32 (0.05) ***	0.30 (0.05) ***
12	3-cycles	-0.36 (0.09) ***	-0.34 (0.11) **
13	Influence when rating others as influential	0.04 (0.37)	-0.01 (0.43)
14	Pride when rating many others as influential	-0.01 (0.07)	0.06 (0.06)
15	Others' influence ratings of proud members	0.03 (0.10)	-0.06 (0.12)
16	Seeing members with similar pride as influential	2.21 (0.80) **	-0.06 (0.92)
17	Linear change in pride	0.31 (0.27)	0.53 (0.26) *
18	General convergence or divergence in pride	-0.55 (0.09) ***	-0.42 (0.08) ***
19	Leader's higher influence	0.11 (0.14)	0.14 (0.13)
20	Leaders perceiving more others as influential	0.16 (0.15)	0.15 (0.14)
21	Different pride changes for leaders	-0.05 (0.23)	0.32 (0.20)
22	Women's higher influence	0.11 (0.14)	0.12 (0.13)
23	Women perceiving more others as influential	0.12 (0.14)	0.14 (0.13)
24	Seeing members with similar gender as influential	0.16 (0.14)	0.19 (0.13)
25	Different pride changes for men	-0.53 (0.21)*	-0.26 (0.16)

Note. The numbers in the table represent estimates and their standard errors (between brackets). A t-ratio is obtained by dividing the parameter estimate by its standard error.

†p < .10, *p < .05, **p < .01, ***p < .001.

Table A.11 Estimations and standard errors tested in the network model for gratitude

Nr.	Effect	Gratitude
Effect of interest:		
1	The spread of gratitude through influence ties	0.52 (0.26)*
Controls:		
2	Influence rating intercept	-2.38 (0.63)***
3	Agreement in influence ratings	1.06 (0.14)***
4	Influence rating change (period 1)	4.41 (0.48)***
5	Influence rating change (period 2)	3.09 (0.30)***
6	Gratitude change (period 1)	1.60 (0.28)***
7	Gratitude change (period 2)	1.73 (0.27)***
8	Gratitude when rated as influential by many others	0.07 (0.05)
9	Grateful member's ratings of others' influence	0.10 (0.10)
10	Influence rating reciprocity	0.42 (0.22)†
11	Transitive triplets	0.32 (0.04)***
12	3-cycles	-0.34 (0.10)***
13	Influence when rating others as influential	-0.07 (0.44)
14	Gratitude when rating many others as influential	-0.02 (0.07)
15	Others' influence ratings of grateful members	-0.04 (0.09)
16	Seeing members with similar gratitude as influential	0.34 (0.80)
17	Linear change in gratitude	-0.01 (0.30)
18	General convergence or divergence in gratitude	-0.58 (0.09)***
19	Leader's higher influence	0.13 (0.15)
20	Leaders perceiving more others as influential	0.21 (0.13)
21	Different gratitude changes for leaders	-0.21 (0.24)
22	Women's higher influence	0.12 (0.12)
23	Women perceiving more others as influential	0.11 (0.13)
24	Seeing members with similar gender as influential	0.21 (0.13)†
25	Different gratitude changes for men	-0.47 (0.21)*

Note. The number in the table represent estimates and their standard errors (between brackets). A t-ratio is obtained by dividing the parameter estimate by its standard error. † < .10, * < .05, *** < .01.

A.3. Supplementary tables of Chapter 7

Table A.12 Path coefficients and unstandardized errors (between brackets) in the mediation models (Study 1)

	Group identification → emotional fit (unmediated)	Group identification → emotions	Emotions → emotional fit	Group identification → emotional fit (mediated)	Test of indirect effect
Positive emotions - Week 2 & Week 4	0.37 (0.07)***	0.38 (0.07)***	0.50 (0.06)***	0.18 (0.07)**	0.19 (0.04)***
Negative emotions - Week 2 & Week 4	0.37 (0.07)***	-0.41 (0.09)***	-0.57 (0.06)***	0.11 (0.05)*	0.23 (0.06)***
Positive emotions - Week 4 & Week 10	0.24 (0.07)***	0.35 (0.06)***	0.32 (0.04)***	0.13 (0.06)*	0.11 (0.03)***
Negative emotions - Week 4 & Week 10	0.24 (0.07)***	-0.52 (0.08)***	-0.44 (0.06)***	0.02 (0.04)	0.23 (0.05)***
Positive emotions - Week 10 & Week 13	0.24 (0.05)***	0.47 (0.06)***	0.27 (0.06)***	0.12 (0.06)*	0.13 (0.03)***
Negative emotions - Week 10 & Week 13	0.24 (0.05)***	-0.45 (0.07)***	-0.39 (0.06)***	0.07 (0.05)	0.18 (0.04)***

Note. *p < .05, **p < .01, ***p < .001.

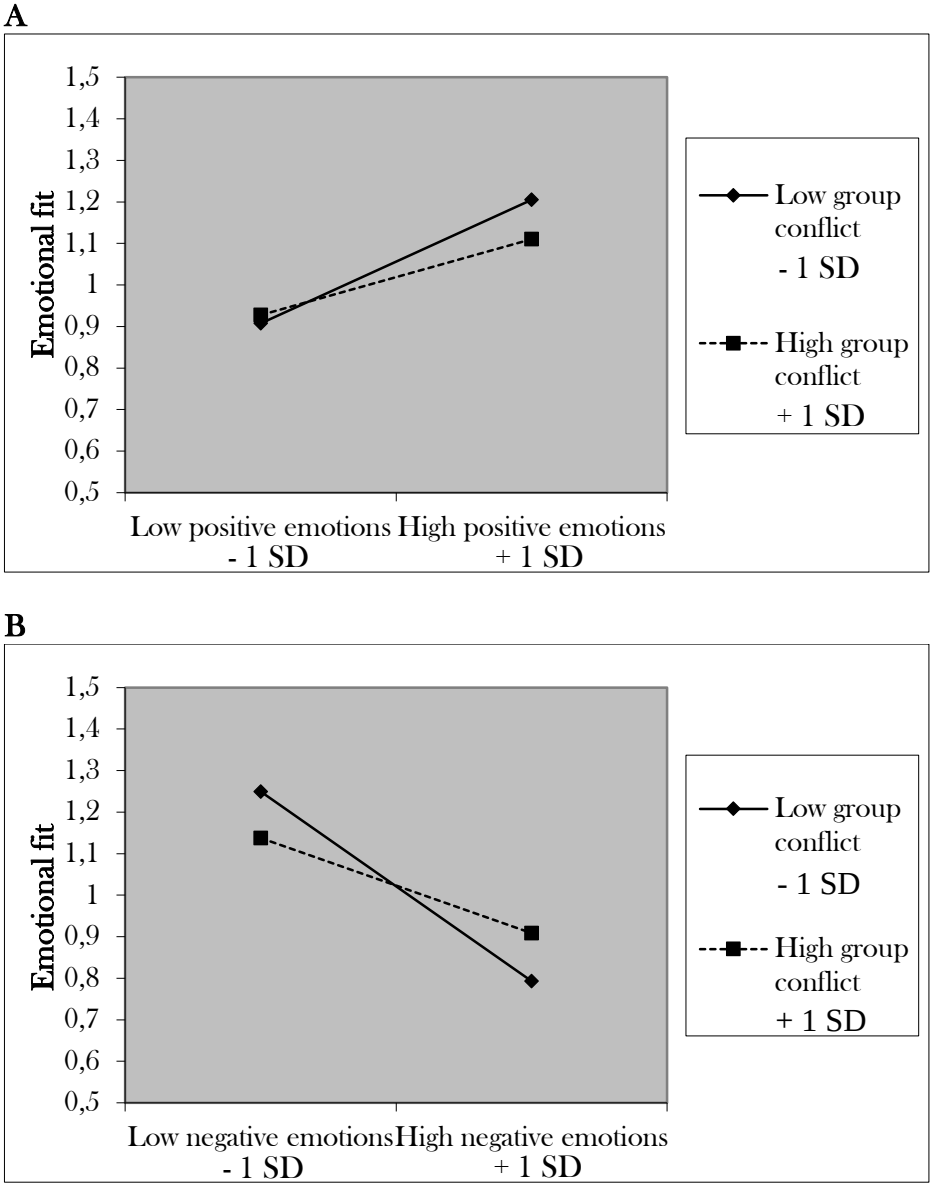


Figure A.1 Interaction between positive emotional experience and group conflict in predicting members' emotional fit (panel A), and between negative emotional experience and group conflict in predicting members' emotional fit (panel B).

Table A.13 Path coefficients and unstandardized errors (between brackets) in the mediation models (Study 2)

	Group identification → emotional fit (unmediated)	Group identification → emotions	Emotions → emotional fit	Group identification → emotional fit (mediated)	Test of indirect effect
Positive emotions - Positive situation	0.30 (0.04)***	0.44 (0.05)***	0.58 (0.03)***	0.05 (0.03)	0.26 (0.03)***
Negative emotions - Positive situation	0.30 (0.04)***	-0.24 (0.04)***	-0.78 (0.04)***	0.13 (0.02)***	0.19 (0.04)***
Positive emotions - Negative situation	-0.06 (0.03)†	0.19 (0.05)***	-0.27 (0.06)***	0.004 (0.03)	-0.05 (0.02)**
Negative emotions - Negative situation	-0.06 (0.03)†	-0.22 (0.07)**	0.21 (0.04)***	-0.004 (0.03)	-0.04 (0.02)**

Note. †p < .10, **p < .01, ***p < .001

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