

**The Role of Warmth in the Improvement of Intergroup
Attitudes**

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Abstract

This dissertation presents two research programs that investigated whether warmth can improve intergroup attitudes. The first research program included three studies that tested whether spontaneous racial attitudes are more positive toward children than adults. These studies were based on the assumption that children are perceived as being higher in trait warmth, which may improve attitudes by decreasing perceived threat and distance to the out-group. In contrast, the results showed that participants consistently preferred their racial in-group over the racial out-group, and there was no evidence that this spontaneous racial bias was reduced for very young child targets; spontaneous racial bias is strong even when warm groups are considered. The second research program comprised four studies that focused on explicitly measured intergroup attitudes. These studies examined whether individual differences in the need for affect (NFA) and (for completeness) the need for cognition (NFC) predict improved attitudes toward groups varying on stereotypical warmth and competence. These studies were based on the notion that people higher in NFA evaluate warmth more positively because they enjoy the emotionally stimulating aspect of warmth. The findings indicated that people higher in NFA evaluated stereotypically warm and incompetent groups more positively than stereotypically cold and competent groups, whereas people higher in NFC evaluated stereotypically cold and competent groups more positively than stereotypically warm and incompetent groups. Moreover, as expected, this set of studies also provided direct evidence that evaluations of warmth mediated these associations. Together, the two programs of research suggest that warmth may be one important mechanism for improving intergroup attitudes on an explicit measure, whereas more research is needed to examine when warmth can improve attitudes on an implicit measure.

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Chapter 1

General Introduction

Prejudice is a pervasive issue in society. However, there have been several instances in which initially strong negative sentiments between groups were substantially reduced and in some cases even replaced with mutual positive regard. Consider, for instance, the dramatic improvement in relations among European countries. French-German relations were initially characterized by strong feelings of hostility and desire for revenge across generations, but these improved gradually and substantially over the decades since the Second World War. In fact, in a recent poll, more than 85% of German and French respondents indicated that they have a fairly good or very good image of the other country (Fourquet & Bonneval, 2012).

What are the reasons for this improvement in intergroup attitudes? Most of the reasons mentioned by the respondents alluded to the increase in cooperation between the countries (Fourquet & Bonneval, 2012), which may have built mutual trust and led to friendships between inhabitants of the countries. This evidence suggests that factors such as cooperation, trust, and friendship might play an important role in the improvement of intergroup attitudes. Of relevance to the present dissertation, a common denominator in these factors is the perception of warmth in the other person or the other group (i.e., interpersonal and intergroup warmth). The importance and centrality of perceived warmth in people's impressions of individuals and groups has been demonstrated consistently (Abele & Wojciszke, 2007; Asch, 1946; Fiske, Cuddy, Glick, & Xu, 2002) and it has been found that the reason for its importance is that it indicates the extent to which a target is perceived as harmful and threatening versus beneficial and supportive (Cuddy, Fiske, & Glick, 2008; Oosterhof & Todorov, 2008). Hence, given that factors such as perceived threat, perceived support, and trust are assumed to form part of perceived warmth, seeing an out-group as warm could improve attitudes toward the out-group.

This dissertation presents several studies that examine the role of perceived warmth of groups and group members in the improvement of intergroup attitudes. In particular, the presented studies test the effectiveness of different sources of perceived interpersonal and intergroup warmth in improving intergroup attitudes. Before describing these mechanisms and the studies, it is important to provide some general background on prejudice and intergroup attitudes. In this chapter, I will first present evidence showing the prevalence and adverse consequences of prejudice, which attest to the severity of prejudice in society and the importance of finding ways to improve intergroup attitudes. Next, I will focus on key aspects of prejudice that are relevant for the present line of research. Subsequently, I will highlight the importance of warmth in person and group perception, suggesting that perceived warmth may provide powerful mechanisms to improve intergroup attitudes. Following this, I will present different mechanisms to improve intergroup attitudes and discuss the extent to which these mechanisms are related to warmth. Finally, I will discuss one particularly relevant example of how warmth can improve intergroup attitudes in more detail and close with an overview of the studies to follow.

Prevalence and Consequences of Prejudice

In his seminal book *The Nature of Prejudice*, Allport (1954, p. 9) defined prejudice as “an antipathy based upon a faulty and inflexible generalization”. Also in more recent definitions of prejudice, researchers agree that prejudice involves a usually negative prejudgment of a group or its members (Gilovich, Keltner, & Nisbett, 2010; Plous, 2003). As noted above, such negative prejudgments, predominantly toward ethnic groups, are still pervasive in today’s societies. In fact, although egalitarianism has increased substantially in many societies and hence the endorsement of prejudice has declined strongly (Bobo, 2001; Gaertner & Dovidio, 2005), a substantial body of scientific literature indicates that prejudice is ubiquitous and possibly even inevitable.

In particular, Allport proposed that prejudice stems from a natural tendency to put stimuli into categories. He stated that “The human mind must think with the aid of categories... Once formed, categories are the basis for normal prejudgment. We cannot possibly avoid this process. Orderly living depends upon it.” (p. 20). Hence, when we meet someone, we quickly and automatically put this person into categories, such as male or female, young or old, and also Black or White (Fiske, 1998). For instance, an individual’s ethnicity is registered within 120ms (Ito, Thompson, & Cacioppo, 2004). Such categories are connected to a host of beliefs, feelings, and evaluations based on previous experience, and they are automatically triggered upon activation of the category (Cunningham et al., 2004; Fiske & Neuberg, 1990; Smith & DeCoster, 2000). As a result, people can form a negative impression of an out-group member outside of their awareness. For example, research has shown that out-group faces that are presented subliminally activate the amygdala to a stronger extent than in-group faces, indicating increased negative affect and higher perceptions of threat (Anderson, Christoff, Panitz, De Rosa, & Gabrieli, 2003; Cunningham et al., 2004; Isenberg et al., 1999; Lieberman, Hariri, Jarcho, Eisenberger, & Bookheimer, 2005; Zald, 2003).

Alongside this research showing that already existing prejudice is quickly and automatically activated, another line of research indicates that social categorization is a sufficient condition for prejudice and discrimination to develop. Specifically, research using the minimal group paradigm has shown that simply allocating people to arbitrary groups leads group members to favor their in-group over an out-group (Diehl, 1990; Tajfel, 1970). Participants allocated more resources to their in-group and less to the out-group even after controlling for the influence of self-interest and while precluding any interaction with in-group or out-group members. Hence, together with the findings that social categorization is a natural tendency and occurs very early, the evidence from the minimal group paradigm may imply that prejudice is inevitable and ubiquitous.

Moreover, a variety of evidence suggests that there are motivational and cognitive factors that keep prejudice alive or even lead to more prejudice. For instance, motivational factors include perceiving an out-group more as a realistic threat in competition over limited resources, such as in a crisis, and this is associated with more prejudice toward the group (Quillian, 1995; Zaraté, Garcia, Garza, & Hitlan, 2004). Similarly, an increase in prejudice has also been shown for higher perceived symbolic threat, when the in-group's values and norms are threatened (Velasco González, Verkuyten, Weesie, & Poppe, 2008; Zaraté et al., 2004). Furthermore, cognitive factors such as confirmation biases keep prejudice alive such that people pay more attention to information that confirms their stereotypes and prejudice than to disconfirming information (Bodenhausen, 1988).

The ubiquity of prejudice in society has disastrous consequences for people's lives. For instance, there are large disparities in economic status, education, and even physical health between White Americans and African and Hispanic Americans. Compared to White Americans, African and Hispanic Americans are less likely to attain a college degree, they are more likely to be poor, to be unemployed, and they have a lower income on average (Blank, 2001). Moreover, death rates from cancer, heart disease, and diabetes are higher among ethnic minorities in the US than among White Americans, even after controlling for factors such as income, age, and severity of condition (Nelson, 2002). Balsa and McGuire (2003) suggested that racial prejudice and stereotypes play an important role in these racial disparities and this hypothesis has been supported by substantial scientific evidence (Dovidio et al., 2008). However, despite this evidence, only one third of White American participants believe that racial discrimination is a major factor accounting for these gaps between the ethnicities, as compared to two thirds of African American respondents (Jones, 2008). Accordingly, 78% of African American respondents indicated that racism in the US is a widespread

issue. This evidence from everyday life indicates that prejudice is still a prevalent problem today.

Moreover, social cognition research has confirmed adverse consequences of prejudice for minority group members across different domains. Such adverse consequences include lower well-being, lower self-esteem, reduced cognitive resources, reduced enjoyment of an interracial encounter, and lower performances under the pressure of stereotypes (i.e., stereotype threat; Branscombe, Schmitt, & Harvey, 1999; Richeson, Trawalter, & Shelton, 2005; Shelton, Richeson, & Salvatore, 2005; Steele & Aronson, 1995). Interestingly, there is also evidence suggesting detrimental consequences for majority group members, who showed reduced cognitive resources after an interracial encounter (Richeson & Trawalter, 2005).

Overall, there is evidence to indicate that prejudice is prevalent, easily developed and activated, with negative consequences for targets of prejudice and even for the prejudiced person. In the increasingly multicultural societies of today, the severity and ubiquity of prejudice and discrimination is important and a threat to social cohesion and functioning. Hence, developing ways to improve intergroup attitudes would contribute to a higher well-being and a better quality of life for members of minority groups. Some of the evidence discussed in this section indirectly supports the notion that perceived warmth may provide such ways to reduce prejudice. That is, whereas higher prejudice is associated with perceiving the out-group as more threatening (e.g., Anderson et al., 2003; Velasco González et al., 2008; Zarate et al., 2004), perceived warmth has been argued to be associated with lower perceived threat and harm (Cuddy et al., 2008). Hence, perceiving warmth in an out-group may reduce perceptions of threat, thereby improving attitudes toward the out-group. Before I turn to perceived warmth and its potential to improve intergroup attitudes in more detail, the following

section will focus on key aspects of prejudice that are relevant for the present line of research.

Explicit and Implicit Measures of Prejudice

A substantial body of research indicates that there are different forms of prejudice and different ways of measuring prejudice. These differences play an important role in mechanisms to reduce prejudice and, more specifically, in the studies that were conducted in this dissertation.

The literature on prejudice indicates that the traditional form of racial prejudice, namely blatant racism, has largely been replaced with the contemporary form of aversive racism (Dovidio & Gaertner, 2004; Gaertner & Dovidio, 1986). Aversive racism is a more subtle form of prejudice and consists of two opposing motivations. That is, although aversive racists consciously endorse egalitarian values and regard themselves as non-prejudiced, they also possess subconscious negative feelings and beliefs about other groups. This aversive racism may account for the racial disparities in economic, educational, and health outcomes mentioned in the previous section. Several studies have revealed that despite overtly rejecting prejudice, people's spontaneous racial bias can leak through when they have an excuse to conceal their discrimination. For instance, aversive racists did not discriminate against a Black target in a staged emergency situation when they were the only witness to that emergency; they helped both a Black and White target 85% of the time. However, when there were other witnesses and aversive racists hence had an excuse for not helping the victim (e.g., the other witnesses could help), they helped the Black target less often than the White target (i.e., 38% vs. 75% of the time; Gaertner & Dovidio, 1977). Similar instances have been documented for job interviews and for medical decisions by physicians (Dovidio et al., 2008). Hence, such indirect forms of discrimination in aversive racists

can explain the persistent racial disparities in educational, economic, and health outcomes, despite the rise of egalitarian views.

Extensive research has shown that these overt and covert evaluations of groups can be captured with different measures of prejudice, which are either explicit or implicit in nature. Explicit measures of prejudice utilize self-reports and hence are often viewed as assessing people's consciously endorsed attitudes toward a group or a group member (Gawronski & Bodenhausen, 2006). Accordingly, people may answer self-report items in a more socially desirable and unprejudiced fashion, depending on their motivation and ability to conceal their true attitude (Fazio, 1990). People's motivation to conceal their prejudice may depend on how acceptable it is to openly express negative opinions about a particular group. For instance, it is regarded as more acceptable to express negative views toward Islamic fundamentalists and skinheads than toward Jewish people and physically handicapped people (Franco & Maass, 1999). People's ability to conceal their negative response depends on the time and the cognitive resources they have available. Given that there is usually no time pressure in self-report measures, people can control their responses on explicit measures of prejudice quite well.

In an attempt to uncover prejudiced responses when people prefer not to express them, implicit measures of prejudice have been developed (Fazio, Jackson, Dunton, & Williams, 1995; Greenwald, McGhee, & Schwartz, 1998). These measures, such as the Implicit Association Test (IAT; Greenwald et al., 1998) and the Affect Misattribution Procedure (AMP; Payne, Cheng, Govorun, & Stewart, 2005) assess evaluations that are automatically activated upon being presented with the group. Given that these measures usually ask participants to respond under time pressure or based on subconscious feelings, implicitly measured prejudice is thought to function without a person's full

awareness or control and can hence be revealed despite people's motivation to conceal their prejudice (Gaertner & Dovidio, 2005; Greenwald & Banaji, 1995).

This distinction between explicit and implicit measures of prejudice also helps to explain the apparent contradiction between the rise in egalitarian views and the persistence of racial disparities discussed at the outset of this introduction. That is, despite an overt rejection of racial prejudice, people often spontaneously activate negative feelings and beliefs when they are presented with an out-group. As discussed above, such spontaneous negativity toward out-groups can develop easily and automatically, and this is based to some extent on people's natural tendency to categorize social stimuli and to favor the in-group. This automatic negativity, and implicit measures of prejudice assessing it, appear to be vitally important, because they predict people's nonverbal behavior toward out-group members. For instance, Dovidio, Kawakami, and Gaertner (2002) found that implicitly measured prejudice predicted participants' nonverbal friendliness to a Black person compared to a White person and the target's perception of the participants' friendliness. This, and other research (e.g., Richeson & Shelton, 2005), shows that targets of prejudice are especially attentive to these nonverbal signs of prejudice, suggesting that spontaneous prejudice may be the driving factor behind the adverse consequences for minority group members. In particular, the reason that minority group members suffer from lower well-being, lower self-esteem, worse performances, and less enjoyment in interracial interactions may be that they notice these signs of unfriendliness in a prejudiced person – signs that are predicted by the implicit measures of prejudice.

This evidence should not be taken to imply that explicit measures of prejudice have no utility. In contrast, they can be very useful for predicting deliberative actions toward an out-group. For instance, Dovidio et al. (2002) found that explicitly measured prejudice was related to participants' verbal friendliness to a Black person compared to

a White person and participants' perception of their own friendliness toward the person. It stands to reason that people's overt prejudiced behavior may also have adverse consequences for the quality of life and well-being of targets of prejudice. Moreover, explicit and implicit measures of prejudice may simply be two sides of the same coin with one measuring prejudice on a spontaneous level largely outside of people's control, and the other measuring prejudice on a conscious level (Dambrun & Guimond, 2004; Gawronski & Bodenhausen, 2006). Hence, when people's motivation or ability to control their prejudice is low, then explicit measures of prejudice have been found to capture similar information as implicit measures (Dunton & Fazio, 1997; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005). Finally, people may be more inclined to reveal negativity toward a group on an explicit measure when they compensate for this negativity by simultaneously expressing positivity toward the group. For instance, research on the stereotype content model (SCM; Cuddy et al., 2008; Fiske et al., 2002) has shown that many groups are perceived ambivalently with positive perceptions on the warmth dimension and negative perceptions on the competence dimension (or vice versa). This way, people consciously endorse a negative belief about a group by compensating and justifying it with a positive belief. Thus, by looking at ambivalent evaluations, negative sentiments toward groups may also be revealed on explicit measures of prejudice. The stereotype content model will be discussed in more detail below.

In sum, even though blatant prejudice has decreased substantially, people's negative sentiments toward out-groups may now be better concealed in different ways and can still impact people's well-being depending on the situation. Hence, attempts to improve intergroup attitudes need to consider both explicit and implicit measures of prejudice. Importantly, interpersonal and intergroup warmth may provide such effective mechanisms to improve intergroup attitudes, which is the focus of the present

dissertation. The next section highlights the importance of warmth in person and group perception, suggesting that it could provide a powerful source to improve intergroup attitudes. Following this, I will present mechanisms to improve intergroup attitudes that are relevant to warmth.

Interpersonal and Intergroup Warmth

There is both theoretical and empirical evidence that warmth plays an important role in person and group perception. Theoretically, it is vital to identify what a person's or a group's intentions are with regard to the self or the in-group (Cuddy et al., 2008). People and groups that are perceived as good-natured, trustworthy, and friendly (i.e., warm) are seen as benefitting the self and the in-group, whereas people and groups that are perceived as less trustworthy and friendly (i.e., cold) are seen as harming. Hence, perceiving individuals and groups as warm may signal that they should be approached, whereas perceiving individuals and groups as cold may signal that they should be avoided (Cuddy et al., 2008; Oosterhof & Todorov, 2008). In his seminal study, Asch (1946) was the first to provide empirical evidence for the importance and centrality of warmth in person perception. That is, he found that impressions of a person changed drastically when either the trait "warm" or the trait "cold" was inserted in a description. This was not the case when control traits were inserted (i.e., polite and blunt; see also Kelley, 1950). In a more structural approach, Rosenberg, Nelson, and Vivekananthan (1968) asked participants to sort traits into categories that "tend to go together in the same individual". Analyses revealed that the sorted traits best fitted a two-dimensional structure, one contrasting social good-bad (i.e., warmth) and the other contrasting intellectual good-bad (i.e., competence). The warmth dimension included such traits as warm, sociable, and helpful versus cold, unpopular, and unhappy.

There is also more recent support for the importance of warmth in the perception of groups and individuals. The stereotype content model (SCM; Cuddy et al., 2008;

Fiske et al., 2002) posits that person and group perception commonly varies along the two dimensions of warmth and competence, and data examining the SCM has shown that various societal groups fall consistently into different clusters along these two dimensions. Interestingly, research that tested the perception of groups on an implicit level has confirmed such differentiations on the warmth and competence dimensions (Carlsson & Björklund, 2010). In addition, Abele and Wojciszke (2007) found that when participants rated a pool of 300 traits on warmth-related and competence-related constructs, 66% of the variance among the constructs was explained by a warmth factor and 23% of the variance was explained by a competence factor.

There is substantial additional research that utilized similar constructs to warmth and competence, such as communion and agency in person perception (Bakan, 1966), trustworthiness and dominance in face perception (Oosterhof & Todorov, 2008), other-profitability and self-profitability (Peeters, 2002), and morality and competence (Wojciszke, Bazinska, & Jaworski, 1998). In research on person perception, the dimensions communion and agency have been dubbed the Big Two (a phrase distinguishing them from the Big Five model of personality; Abele & Bruckmüller, 2011; McCrae & Costa, 1999). Importantly, Abele and Bruckmüller (2011) showed that communion is the primary dimension. This was evidenced by an advantage for communal over agentic traits in speed of recognition, speed of categorization as positive or negative, speed of inference from behavioral descriptions, and order of mentioning traits in a person description. Moreover, in research on face perception, Todorov, Baron, and Oosterhof (2008) presented evidence that the trustworthiness of faces is rapidly inferred and corresponds to activation in the amygdala, further supporting the importance of trustworthiness and hence warmth.

Overall, there is strong support for the importance of warmth in interpersonal and intergroup perception, alongside a role for competence. Crucially, the speed with

which warmth information is extracted from targets and the apparent ubiquity and weight of warmth in social perception suggests that it could play a major role in improving intergroup attitudes on explicit and implicit measures. The present dissertation tests two different aspects of warmth that may be effective in improving intergroup attitudes. First, given that factors such as perceived threat and distance play an important role in prejudice (Dotsch & Wigboldus, 2008; Quillian, 1995; Velasco González et al., 2008; Zaraté et al., 2004), perceiving an individual or a group as warm and hence as trustworthy, unthreatening, and approachable may reduce prejudice (Mikulincer & Shaver, 2001). In a similar vein, the findings discussed above showed that both ethnicity and trustworthiness are quickly detected and activate the amygdala (Cunningham et al., 2004; Ito et al., 2004; Lieberman et al., 2005; Todorov et al., 2008; Zald, 2003). This could imply that trustworthiness or warmth can counteract the activation of prejudice, suggesting that warmth may be thought of as an antagonist of prejudice.

Second, warmth may also signal the extent to which a person or a group is emotionally stimulating. In particular, warmth has an emotional aspect given that it contrasts traits such as sentimental and humorous with traits such as boring and unhappy (Rosenberg et al., 1968). As will be made clearer below, there are individual differences in the motivation to approach emotion-inducing events and situations, suggesting that some people may be more favorable toward warmth than toward coldness. Hence, this could indicate that some people show improved attitudes toward warm groups. This second aspect of warmth has not been tested hitherto and will be discussed in more detail at the end of this chapter. The following section will present several mechanisms to improve intergroup attitudes and highlight the role of the first aspect of warmth by considering the mechanisms' relation to warmth-related factors such as perceived threat and distance to the out-group.

Mechanisms to Improve Intergroup Attitudes

As discussed before, there is evidence suggesting that prejudice may be an inevitable consequence of categorization and that it persists despite overt egalitarian orientations, painting a rather gloomy picture of prejudice. However, extensive research in the prejudice literature casts doubt on this pessimistic outlook and shows that both explicitly *and* implicitly measured prejudice can be malleable under certain circumstances and is at least partly under people's control. I will first focus on mechanisms to improve explicitly measured intergroup attitudes, followed by mechanisms to improve implicitly measured attitudes. Importantly, this section also considers how each mechanism may involve warmth and warmth-related factors, such as perceived threat, cooperation, or trust, thereby giving an impression of the potential importance of warmth in improving intergroup attitudes.

The causality between perceptions of warmth and factors such as perceived threat, cooperation, or trust is not the focus of this dissertation. Based on previous research, warmth and warmth-related factors are considered to be closely interconnected, but no claims are made about their causal links. Concerning the causality between warmth and warmth-related factors on the one hand and intergroup attitudes on the other, the present dissertation is based on the notion that warmth leads to an improvement of intergroup attitudes. Although the aim of the following section is only to present evidence for a cross-sectional association between higher warmth and more positive attitudes, some of the research supports this notion of a causal link between warmth and intergroup attitudes.

Improvement of Explicitly Measured Intergroup Attitudes

The Robbers Cave experiment (Sherif et al., 1961) offers a prime example of how prejudice can be reduced in the field and it is a classic forerunner of the idea that interpersonal warmth may be vital to improving intergroup attitudes. In 1954, Muzafer

Sherif and his colleagues carried out an experiment consisting of two parts at a summer camp. For the first part, the 22 boys who had signed up for the experience were divided into two groups of eleven. After the two groups had independently engaged in activities which were designed to engender strong group cohesion, they were brought together again to play competitive games against the other respective group. The competitive nature of these games resulted in insults and provocations against the opposing group members, as well as glorifying and congratulatory commentary for own group members. Moreover, in a more controlled assessment, the boys showed clear in-group favoritism by overestimating their own group members' achievements. However, importantly, in addition to showing how quickly intergroup conflict can erupt, Sherif and his colleagues also showed how it can be reduced in the second part of the experiment. That is, after noticing that simply bringing the two groups together in non-competitive situations did not alleviate the conflict, the investigators confronted the boys with problems that could only be resolved when the groups cooperated. As a result of these superordinate goals for the groups, the conflict and the hostility swiftly decreased, and friendships across group boundaries emerged. In fact, on their return from the summer camp, the group that had won a prize in the competition decided to spend their money on treats for everyone, including the other group members.

The Robbers Cave study illustrates how quickly intergroup conflict can erupt and how it can be reduced by intergroup cooperation and superordinate goals. Establishing superordinate goals may shift people's way of thinking from an "us vs. them" to an overarching "us" that includes the other group, thereby reducing prejudice (Gaertner et al., 2000). Hence, this study indicates that intergroup cooperation and forming an inclusive group are effective mechanisms in improving intergroup attitudes. Importantly, these mechanisms may be effective because they can be related to intergroup warmth. That is, perceiving a group as cooperative rather than competitive

has been associated with perceiving the group as warmer than colder (Fiske et al., 2002), and forming an inclusive group may result in a stronger sense of belongingness and social closeness, which are also related to warmth (Cuddy et al., 2008; Lee & Robbins, 1995). In addition, the finding that friendships across group boundaries emerged and that one group acted pro-socially toward the other group at the end also suggests a role for warmth in the Robbers Cave experiment.

Support for the idea that a stronger degree of cooperation and forming an inclusive group are effective mechanisms in improving intergroup attitudes comes from laboratory and field research on the Common In-group Identity model (Gaertner & Dovidio, 2005; Gaertner, Dovidio, Anastasio, Bachman, & Rust, 1993). This model predicts that intergroup bias can be reduced when members of different groups are led to re-categorize the in-group and the out-group as a single inclusive group. This view has been supported in a number of experiments (e.g., Gaertner, Mann, Murrell, & Dovidio, 1989; Riek, Mania, Gaertner, McDonald, & Lamoreaux, 2010). For instance, in one experiment by Gaertner, Mann, Dovidio, Murrell, and Pomare (1990) participants in two 3-person groups were induced to regard themselves as either one group or as two groups. This was done in a number of ways, by giving a group the same color of chairs and t-shirts, by varying the seating positions, and by choosing names for their groups. Moreover, the experimenters manipulated whether the groups would cooperate or not in order to solve a hypothetical survival problem. The results indicated that, without cooperation, participants in the one-group condition gave a more positive evaluation of out-group members than participants in the two-groups condition. In addition, participants who cooperated perceived themselves more as one group rather than as two groups, and this in turn led to an improvement of attitudes toward the out-group.

This mechanism of a common in-group identity has also been demonstrated for racial groups (Nier et al., 2001). That is, in a similar common in-group identity paradigm, White participants evaluated a Black confederate more positively when they were induced to perceive the Black confederate as part of their group than as an individual. Similarly, the authors showed in a field study prior to a football game that White participants were more likely to behave pro-socially toward Black interviewers with the same team affiliation than to Black interviewers with the opposing team affiliation. Moreover, Riek et al. (2010) found that a common in-group identity among Black and White students was associated with reduced perceived intergroup threat.

Together, these findings on the common in-group identity model provide further support for the notion that forming an inclusive group and cooperating to achieve a superordinate goal are effective mechanisms to improve explicitly measured intergroup attitudes. As discussed above, these mechanisms may imply perceiving the out-group as warmer rather than colder. This would be similar in many ways to the opening example of how European countries, and France and Germany in particular, have improved their relations. That is, as a result of increased cooperation between the countries, the inhabitants may perceive themselves more as Europeans and less as “French vs. Germans” and they may have formed more friendships, leading to a gradual improvement of relations. Moreover, the findings presented above also indicate that a common in-group identity results in more pro-social behavior toward and lower perceived threat of the out-group. Given that lower threat and pro-social behavior are related to warmth (Cuddy et al., 2008; Oosterhof & Todorov, 2008), this substantiates the notion that warmth may play a role in the common in-group identity mechanism.

Another mechanism that may be relevant to warmth was put forward in Allport's (1954) description of the intergroup contact hypothesis. According to Allport, four conditions must be met for intergroup contact to reduce prejudice: equal status between

the groups in the situation, common goals, intergroup cooperation, and the support of authorities, law, or custom. In a recent meta-analysis across studies investigating the intergroup contact hypothesis, Pettigrew and Tropp (2006) provided strong support for this mechanism. In addition, they found that the conditions that Allport deemed essential for reducing prejudice are facilitating rather than essential. That is, intergroup contact alone without these factors results in improved intergroup attitudes, potentially due to a mere exposure effect (Zajonc, 1968), and the “essential conditions” were found to improve attitudes even further. Importantly, the meta-analysis showed that intergroup contact not only improves attitudes toward the interaction partner, but that the effect generalizes to the entire out-group, to out-group members in other situations, and even to other out-groups.

In another meta-analysis, Pettigrew and Tropp (2008) showed that this effect of intergroup contact to improve intergroup attitudes occurs through several processes. In particular, intergroup contact improved attitudes by decreasing anxiety about intergroup contact, by increasing empathy and perspective taking, and, to a lesser extent, by enhancing the knowledge about the out-group. Moreover, more intimate relationships, such as intergroup friendships, are even more effective at improving intergroup attitudes than less intimate relationships. This may be the case because intergroup friendships engender stronger perspective-taking and trust toward the out-group (Paolini, Hewstone, & Cairns, 2007; Pettigrew & Tropp, 2006, 2008; Turner, Hewstone, Voci, Paolini, & Christ, 2007).

Thus, there is strong support for the notion that intergroup contact improves explicitly measured intergroup attitudes. Furthermore, there are several indices that warmth also plays a role in the intergroup contact mechanism. In particular, the relevance of the facilitating factors ‘common goals’ and ‘intergroup cooperation’ to interpersonal warmth has been discussed before in the context of the Robbers Cave

experiment and the Common In-group Identity Model. In addition, the mediational roles of empathy and perspective taking, intergroup contact per se, and especially the increased effectiveness of more intimate relationships in intergroup contact all broadly fit the notion that warmth is important. That is, interpersonal warmth may be reflected in the intimacy of intergroup contact and friendships, and in perceiving a group as less threatening as a result of empathy and perspective taking (Stephan & Finlay, 1999). Hence, intergroup contact may be another mechanism to improve intergroup attitudes that is based to some extent on increasing interpersonal warmth.

Intergroup attitudes may also be improved by individuating and hence de-categorizing an out-group member instead of seeing him or her as part of the out-group. Specifically, in one experiment by Wilder (1978), participants were randomly assigned to one of two groups, and both groups were told that the other group would make a decision as a jury. Subsequently, participants were presented with a unanimous jury decision, a jury decision with one group member dissenting, or a decision from a single group member. The results showed that participants perceived the dissenting out-group member as more individuated and they allocated more money to the out-group as a whole than to their in-group when one out-group member dissented. In contrast, in the other conditions, participants favored their in-group over the out-group. Hence, the individuation mechanism shows that by perceiving out-group members as individuals, people are less likely to discriminate against them. The individuation mechanism may be related to interpersonal warmth because it is conceivable that individuating out-group members decreases people's perceived threat of the out-group, compared to perceiving a unified out-group.

In addition, individual differences in the expression of racial prejudice on explicit measures may also attest to the malleability of intergroup attitudes. In particular, the individual difference variables right-wing authoritarianism (RWA) and

social dominance orientation (SDO) have been shown to be relevant to intergroup attitudes. People higher in RWA conform more to conventions, obey authoritative figures, and show more aggression toward non-conformists (Altemeyer, 1981, 1988), whereas people higher in SDO show a stronger desire for their in-group to dominate out-groups and tend to promote intergroup hierarchies (Pratto, Sidanius, Stallworth, & Malle, 1994). Importantly, research on these individual differences indicates that racial prejudice is stronger for people higher in RWA and SDO than for people lower in RWA and SDO (Ekehammar, Akrami, Gylje, & Zakrisson, 2004; Whitley, 1999). Moreover, there is also evidence suggesting that people higher in RWA and SDO feel less warmth when thinking about the out-group (Whitley, 1999), indicating that individual differences in expressing prejudice may also be related to warmth.

Together, these strands of research indicate that there is strong support for the view that explicitly measured intergroup attitudes can be improved by de-categorizing or re-categorizing group members (Gaertner & Dovidio, 2005). Moreover, individual differences (e.g., RWA, SDO) may also be relevant for intergroup attitudes. Crucially, it is conceivable that warmth plays a role in the effectiveness of these mechanisms given that they have been related to factors such as cooperation, lower perceived threat, and intergroup friendship. Although most of the research discussed in this section provided correlational evidence for the link between warmth and intergroup attitudes, evidence on the Common In-group Identity Model showed consistently that cooperation and forming an inclusive group caused the improvement of intergroup attitudes. This supports the notion that warmth may *lead* to improved attitudes on an explicit measure, at least insofar as warmth subsumes cooperation and inclusivity of others.

Improvement of Implicitly Measured Intergroup Attitudes

The previous section reviewed literature that attests to the malleability of consciously endorsed intergroup attitudes. Similarly, evidence suggests that the early

categorization of race is not inevitable, indicating that it may be possible to reduce the ensuing automatic negative evaluation of out-groups. In particular, Kurzban, Tooby, and Cosmides (2001) suggested that people are not naturally inclined to categorize social targets solely based on their race. Instead, people naturally categorize social targets in terms of coalitional allegiances for which race is just one indicator.

Accordingly, when race was unrelated to coalitional allegiances among targets in their experiments, participants were more likely to categorize the targets in terms of the allegiances and were hence less likely to attend to race.

In addition, research has revealed that the well-documented activation in the amygdala as a result of perceiving a racial out-group's face can be modified. That is, Wheeler and Fiske (2005) showed that, when White participants had the social goal to categorize Black and White faces by age, and were hence led to pay attention to social categories, they showed the expected differential amygdala activity to Black faces versus White faces, indicating racial prejudice. However, when the same participants were given a non-social visual search task when viewing the faces, they showed no differential amygdala activity to the racial in-group and out-group faces. This may be the case because they did not process the targets deeply enough to notice social categories of the targets. Importantly, when the participants were required to make individuated decisions for the target persons, they even showed suppressed activity for Black faces compared to White faces, contrary to the results for the social categorization task.

These studies indicate that the early categorization of race and the subsequent activation of the amygdala signaling negative affect are not set in stone, but can be modified by social goals. Hence, although it may be enough to process a person as a social target for prejudice to arise, perceiving the person as an individual may be a mechanism to disrupt the processes leading to prejudice. This mechanism is similar to

the individuation mechanism discussed in the previous section on improving explicitly measured intergroup attitudes. Hence, individuating an out-group member appears to be a powerful mechanism such that it has been shown to improve attitudes both on an explicit measure and on a spontaneous measure. Moreover, as discussed above, it could be speculated that the individuation mechanism is related to interpersonal warmth to the extent that people perceive individual out-group members as less threatening than an abstract out-group.

If the early categorization of race and the subsequent negative activation is not inevitable, there may also be several mechanisms to improve intergroup attitudes on implicit measures. There is substantial literature and various strands of research supporting this idea. In one example, Mitchell, Nosek, and Banaji (2003) showed that, when targets belong to multiple categories (e.g., a Black woman), then the magnitude of the spontaneous bias depends on the salience of the categories. First, the authors showed that White female participants spontaneously preferred Whites over Blacks and women over men. Importantly, however, when the target's gender was made salient in an implicit measure, Black women were evaluated as positively as women in general, whereas when the target's race was made salient, Black women were evaluated as negatively as Black people in general. Similarly, the authors showed that White participants spontaneously preferred White politicians over Black athletes when race was made salient, but they showed the reverse effect when occupation was made salient. In a similar vein, Dasgupta and Greenwald (2001) first presented participants either with admired Black Americans and disliked White Americans (e.g., Michael Jordan and Ted Bundy) or with disliked Black Americans and admired White Americans (e.g., O. J. Simpson and Jim Carrey). The authors expected that increasing the accessibility of liked and disliked exemplars would modify the spontaneously activated evaluation of the out-group. Consistent with this reasoning, in a subsequent implicit measure of

prejudice, participants who were exposed to admired Blacks showed a lower spontaneous racial bias than participants who were exposed to disliked Blacks. Given that the feeling of admiration has been shown to be reserved for people and groups that are perceived as warm and competent (Cuddy, Fiske, & Glick, 2007), this mechanism may also be related to warmth. That is, this finding broadly fits the notion that spontaneous intergroup attitudes could be more positive for warm targets.

Moreover, whereas the previous examples indicate that construing the out-group differently depending on the salience of the categories can evoke a more positive attitude, there is also evidence that the spontaneous attitude itself can be altered. For example, Olson and Fazio (2006) presented a strategy to improve spontaneous racial attitudes by building on the notion that racial attitudes originally develop as a result of classically conditioning a stimulus (the out-group) with negativity. Hence, in an implicit evaluative conditioning procedure, the researchers aimed to reverse this conditioned association by repeatedly pairing photos of Black individuals with positive words and pairing photos of White individuals with negative words, among filler stimuli. In the control condition, the same stimuli were presented, with the exception that the stimuli were not paired but instead presented separately. The researchers found that, compared to the control condition, White participants showed more positivity on an implicit measure of racial prejudice in the experimental condition that presented previously unseen Black individuals. Moreover, this effect was still present after a 2-day interval.

In a similar vein, Kawakami, Phillips, Steele, and Dovidio (2007) trained participants to approach or avoid Black faces or White faces. Specifically, non-Black participants in the experimental condition repeatedly approached Black faces by pulling a joystick toward themselves and avoided White faces by pushing a joystick away from themselves. In the control conditions, participants repeatedly approached White faces

and avoided Black faces using a joystick or they moved the joystick sideways in response to the faces. The results showed that spontaneous attitudes toward Black people were improved in the experimental condition compared to the control conditions, and this was the case even when the faces were presented subliminally. Importantly, this effect extended to an interaction with a Black confederate, such that participants in the experimental condition sat closer and turned to face the confederate more compared to participants in the control conditions.

Kawakami et al.'s (2007) strategy for improving intergroup attitudes may be especially relevant to warmth. That is, it has been suggested that the warmth dimension may be relevant to basic approach and avoidance tendencies (Fiske, Cuddy, & Glick, 2007) and research has shown that facial characteristics of trustworthiness signal whether a person should be approached or avoided (Oosterhof & Todorov, 2008). People may be more inclined to approach warm targets because they are seen as supporting and beneficial and to avoid cold targets because they are seen as threatening and harming. Hence, training participants to repeatedly approach out-group targets may activate the reverse association that approachable targets are warm, or at least that approaching these targets does not cause harm. Accordingly, the finding that participants sat closer and faced a Black confederate more after the approach-avoidance training fits this notion that the out-group was seen as less threatening, more approachable, and more intimate - all signs of higher perceived warmth.

Another mechanism to improve intergroup attitudes on an implicit measure builds on the intergroup contact hypothesis. In a field experiment, Shook and Fazio (2008) examined whether long-term interracial relationships can reduce spontaneous prejudice by randomly assigning White freshmen to either a White or a Black roommate. At the end of the first quarter, participants who had shared a room with a Black person revealed reduced spontaneous prejudice and intergroup anxiety compared

to participants who had shared a room with a White person. Similar to the speculation above that intergroup contact may improve explicitly measured intergroup attitudes through several factors pertaining to warmth, the authors mentioned the importance of the factors cooperation, having common goals, forming friendships, and intimacy in reducing prejudice. Moreover, the finding that intergroup anxiety was reduced may also suggest that lower perceived threat of the out-group and its relevance to warmth plays a role.

In a similar vein, research suggests that the intergroup contact mechanism may even apply when contact with the out-group is only imagined. Based on findings that imagined intergroup contact improves attitudes on explicit measures (Turner, Crisp, & Lambert, 2007), Turner and Crisp (2010) showed that imagined intergroup contact also improves intergroup attitudes on an implicit measure. That is, compared to a control condition, non-Muslim participants who imagined talking to a Muslim stranger showed an improvement in their spontaneous evaluation of Muslims in general. As discussed above, warmth could also play a role in imagined intergroup contact such that it could imply a reduced perception of threat, an increased feeling of intimacy, and become more effective under conditions of imagined cooperation and forming a common group. In addition, Turner and Crisp (2010) provided more direct evidence that warmth plays a role. Specifically, they showed that imagined intergroup contact also results in lower prejudice on an explicit measure, and this explicit measure assessed the extent to which the Muslim target was seen as warm vs. cold, trusting vs. suspicious, friendly vs. hostile, admirable vs. disgusting, among two other items assessing positivity and respect. Hence, this finding may suggest that an improvement in intergroup attitudes on explicit and implicit measures is associated with perceptions of higher warmth of the target.

In an interesting project, Lai et al. (2014) compared 17 different interventions to improve spontaneous intergroup attitudes toward Blacks. Of these 17 interventions, eight proved to be effective in attenuating racial bias on an implicit measure. Several of these effective interventions used methods akin to the evaluative conditioning procedure, providing support for the robustness of this strategy in improving implicitly measured racial attitudes. In another effective intervention, the participants were assigned to a dodgeball team with only Black teammates and all of the opponents were White. The opponents regularly engaged in unfair play and the Black teammates helped the participant during the game. At the end, participants were asked to remember how their Black teammates helped them and how the White opponents hurt them. Similar to evidence reviewed before, this intervention shows that forming a common group and cooperation are effective mechanisms which can be related to warmth.

Not all of the evidence in Lai et al.'s (2014) research contest fits this view, however. Several of the interventions that proved ineffective in improving implicitly measured racial attitudes also appear to be relevant to warmth. For example, these ineffective interventions included training participants in being empathic and understanding toward Black people, and presenting them with acts of “moral elevation”, e.g., gratitude, generosity, and charity. Moreover, in contrast to the findings by Turner and Crisp (2010), asking participants to imagine interracial contact did not reduce spontaneous prejudice. Finally, emphasizing a superordinate inclusive group by highlighting African Americans’ contributions to America or by communicating a sense of common humanity did not improve spontaneous racial attitudes.

Summary

This section presented several mechanisms to improve intergroup attitudes on explicit and implicit measures and highlighted the potential role of warmth in these mechanisms (see Table 1 for an overview). In addition to these reported mechanisms,

the malleability of intergroup attitudes has been demonstrated in many other ways for explicit measures (e.g., Eisenstadt, Leippe, Rivers, Stambush, & others, 2003; Esses & Dovidio, 2002; for an overview, see Paluck & Green, 2009) and for implicit measures (e.g., Devine, Forscher, Austin, & Cox, 2012; Rudman, Ashmore, & Gary, 2001; for an overview, see Blair, 2002). However, the focal question in this dissertation is whether perceived warmth can form an effective mechanism to improve intergroup attitudes. The evidence discussed in this section provides indirect support for this notion, suggesting that perceived warmth may improve explicitly and implicitly measured intergroup attitudes.

Although the work reviewed above largely supports the idea that warmth improve intergroup attitudes, the relevance of some mechanisms to warmth is speculative, the causal link between warmth and intergroup attitudes in some mechanisms can be contested, and some warmth-related mechanisms proved ineffective. Moreover, as discussed above, another aspect of warmth – emotional stimulation – is a hitherto untested way in which warmth may improve intergroup attitudes. Hence, the evidence so far on the effectiveness of interpersonal and intergroup warmth in improving intergroup attitudes is not conclusive. It is of central importance to shed more light on when warmth plays a role and when it does not, thus allowing for a range of different real-world applications in improving intergroup attitudes.

A study that I conducted as part of my Master's thesis is highly relevant to the effectiveness of warmth in improving intergroup attitudes (Wolf, Karremans, & Maio, 2015). In particular, this study manipulated a source of warmth – the warmth associated with significant others (e.g., relationship partners, parents) – and tested its effect on attitudes toward racial groups. The next section discusses this study in more detail because it provides a strong first test of the present research question. Following this, I

will give an overview of the research in this dissertation that will examine novel sources of warmth and their effect on intergroup attitudes.

The Warmth of Significant Others in Reducing Prejudice

Two experiments that I conducted during my Master's degree examined whether warmth can improve intergroup attitudes (Wolf, Karremans, et al., 2015). In particular, I considered that significant others may provide a rich source of warmth based on research showing that positive relationships with one's significant other involve higher tenderness and warmth than relationships with others (Chen & Andersen, 1999; Saribay & Andersen, 2007). Importantly, research on the transference effect has consistently demonstrated that, when a target person resembles a positive significant other, the positive (warm) feeling associated with the significant other is transferred onto the target person, resulting in a more positive evaluation of that target (Andersen & Baum, 1994; Andersen & Berk, 1998). The rationale behind this transference effect is that traits of a significant other, which are recognized in a newly met person, activate the mental representation of the significant other, which is then applied to the person. I adopted this design of presenting a target person that resembles a significant other by testing whether such a positive transference effect extends to racial out-group targets. That is, this study examined whether racial attitudes can be improved by transferring warmth of a positive significant other onto a racial target, testing the effect on an explicit measure and on behavior toward out-group targets.

This study formed a partial conceptual replication of a study by Kraus, Chen, Lee, and Straus (2010) that selected mainly Asian American participants and presented them with Asian American in-group targets and European American out-group targets. Kraus et al. showed unexpectedly that participants did not evaluate targets more positively when they resembled their significant other than when they did not. However, the authors provided evidence for a transference effect on behavior toward a

racial out-group target such that participants placed their chair closer to the target in a waiting room paradigm in the resemblance condition compared to a control condition, regardless of the target's ethnicity. I aimed to build on these findings by selecting potentially more negatively viewed out-groups, by applying methodological changes to make it a more stringent and ecologically valid test, and by including other relevant measures to clarify underlying processes.

In more detail, the first experiment was conducted in the Netherlands with Dutch in-group targets and Moroccan out-group targets, whereas the second experiment was conducted in the United Kingdom with British Christian in-group targets and Indian Muslim out-group targets. Both experiments consisted of two sessions. In the first session, participants' level of explicit and implicit prejudice was measured and participants described their significant other in a sentence completion task. In the second session, which occurred three weeks later, resemblance of the target to the significant other was manipulated within participants (Experiment 1) or between participants (Experiment 2). The procedure to manipulate resemblance closely mirrored the method developed by Andersen, Glassman, Chen, and Cole (1995). Participants were presented with a target that resembled their own significant other or with a target that resembled a matched participant's significant other. The own significant other description contained some of the traits that participants had used in the first session, among filler traits. In the yoked significant other description, participants were exposed to the exact same traits as those in the own significant other condition, with the only difference that the traits did not match their own significant other (i.e., a yoked design). In addition, the ethnicity of the target person was manipulated between participants in the descriptions, that is, the first two (or three in Experiment 2) items of the descriptions presented the targets either as belonging to participants' in-group or out-group. Following each of these descriptions, participants indicated their general impression of

the target. Finally, participants' behavior toward the target was measured. In Experiment 1, participants completed a social dilemma task. In this task, participants received coins that were worth more when they were given to the other than when they were kept. Participants were told that the target also received coins and could distribute them. The task was to indicate in a single round how many coins they want to give to the target. In Experiment 2, participants received lottery tickets and they were asked to distribute these tickets between themselves and the target.

The results showed that, across both experiments, the out-group targets benefitted from a transference effect such that they were seen more positively in the own-significant other condition than in the yoked-significant other condition. Surprisingly, whereas Experiment 1 revealed a stronger transference effect for in-group targets than for out-group targets, Experiment 2 did not reveal improved attitudes for the in-group as a result of transference. It is not clear what may have caused this latter unexpected finding. Concerning the behavioral measure, both experiments only showed a transference effect for in-group targets but not for out-group targets. Interestingly, these findings for out-group targets occurred regardless of people's level of prejudice on explicit and implicit measures. And finally, Experiment 1 provided support for the proposed rationale behind the transference effect such that the perceived similarity of the target to the significant other mediated the effect of resemblance on favorability toward the targets.

Together, this study provides consistent evidence that the warmth associated with a significant other can improve intergroup attitudes on an explicit measure. Given that participants were first presented with the out-group membership of the target and only then with the characteristics implying warmth, this study provided an ecologically valid test of whether a first impression of an out-group member can be improved through warmth.

These findings that the warmth of a significant other can improve explicitly measured intergroup attitudes are further supported by a study by Mikulincer and Shaver (2001). The authors showed that visualizing a person “who accepts and loves you and helps you in times of need” improved participants’ evaluation of Russian immigrants. This effect appeared to be mediated by reduced perceived threat of the out-group, providing support for the assumption made above that lower perceived threat associated with higher warmth improved intergroup attitudes.

However, the study that I conducted also suggests that there may be limits to this mechanism, such that transference may be less effective in improving behavior toward out-group members. It is conceivable that the reason for this inconsistency with Kraus et al.'s (2010) findings lies in the choice of behavioral measures, given that my measure involved sacrificing one’s own benefit for the other person and Kraus et al.’s measure assessed interpersonal distance. Hence, it may be the case that whereas transference reduces interpersonal distance to out-group members, self-sacrifice introduces added motivational impediments that reinstate intergroup boundaries, leading to the obtained null-effects. For instance, these motivational impediments may arise as a result of an increased concern about economic threat when the behavior demands self-sacrifice.

Hence, the studies discussed in this section show that significant others provide one source of warmth that causes an improvement of racial attitudes. This was the case for explicit measures of prejudice and may also apply to a certain type of behavioral measures but not to others. The next section presents an overview of the research conducted in this dissertation which investigates novel sources of warmth to improve intergroup attitudes.

Overview of the Present Research

Building on this evidence that significant others provide a source of warmth that can improve intergroup attitudes toward a racial out-group member on an explicit

measure, the following studies were designed to test two novel sources of warmth. In particular, two research programs presented groups that are inherently associated with warmth because these may provide a more powerful source of warmth than indirectly describing the warmth of a target. That is, we feel high levels of warmth toward infants and toward stereotypically warm target groups. The question asked here is how these targets of high warmth can be used to improve intergroup attitudes on explicit and implicit measures. Rather than applying the same design to test the effects of these two targets of warmth, it was more appropriate to apply particular designs of relevance for each target. First, for child targets, I considered that their facial features may trigger perceptions of warmth, based on previous findings (Alley, 1983; Berry & McArthur, 1985; Glocker et al., 2009; McArthur & Apatow, 1984). Hence, the first research program presented faces of racial out-group children and adults based on the assumption that the warmth of the children's facial features in presented images would improve racial attitudes. Second, I used people's stereotypes about groups that vary along the warmth and the competence dimension (Fiske et al., 2002) and investigated the role of individual differences in the evaluation of the groups.

For both series of studies, I expected that perceiving a target as warmer rather than colder would be associated with more positive intergroup attitudes. The two research programs assume different underlying processes for this potential improvement of attitudes. That is, racial attitudes could be improved for children because their higher perceived warmth may imply that they are seen as less harming and threatening and instead as more trustworthy and approachable (Fiske et al., 2007; Oosterhof & Todorov, 2008). This hypothesis is based on findings that perceived threat and interpersonal distance play an important role in prejudice (Dotsch & Wigboldus, 2008; Quillian, 1995; Velasco González et al., 2008; Zaraté et al., 2004), and hence decreasing perceived threat and distance may be vital to improve intergroup attitudes (Mikulincer

& Shaver, 2001). The second research program assumes that stereotypically warm groups are perceived as more emotionally stimulating than stereotypically cold groups, given that warmth has an emotional aspect because it contrasts traits such as sentimental and humorous with traits such as boring and unhappy (Rosenberg et al., 1968). As will be made clearer below, there are individual differences in the motivation to approach emotion-inducing events and situations, suggesting that some people may be more favorable toward warmth than toward coldness. Hence, this could indicate that some people show more positive attitudes toward warm groups. I now turn to a more detailed discussion of these two research programs.

The research programs were not pre-designed as a sequence, but evolved while conducting the research such that each study was designed based on the findings of the previous studies. The following studies also built on the research discussed in the previous section which investigated whether the warmth of significant others can improve intergroup attitudes. Although these findings largely provided support for the hypothesis on explicit measures, the results were less clear for behavioral measures. This leaves open the question whether more indirect measures, such as behavioral measures and implicit measures of prejudice, are less likely to be influenced by warmth information. This possibility is crucial, because, as discussed above, people's negative sentiments toward ethnic out-groups may now be better concealed but can still impact people's well-being. Hence, attempts to improve intergroup attitudes need to consider both explicit and implicit measures. The first research program examines this issue more closely by testing whether the perceived warmth of a target can improve racial attitudes on an implicit measure (Wolf, Maio, Karremans, & Leygue, 2015). Moreover, this series of studies used a novel source of warmth by presenting a group that is already associated with warmth instead of an individual target that is indirectly described as warm. In particular, I considered that the warmth of children may be a strong

mechanism to improve racial attitudes, given that research has found that targets with neonatal facial features are perceived as warmer, kinder, and more trustworthy, and they elicit motivations for caretaking (Alley, 1983; Berry & McArthur, 1985; Glocker et al., 2009; McArthur & Apatow, 1984; Oosterhof & Todorov, 2008). Hence, in Chapter 2, three studies investigated whether participants' spontaneous racial prejudice was reduced for very young child targets, as compared to adult targets.

One limitation of this research described in Chapter 2 is that it only examined warmth indirectly, by assuming that children are perceived as warm. Hence, the second series of studies provided more direct evidence for the role of warmth in reducing prejudice. Moreover, as discussed above, research examining the stereotype content model (SCM; Cuddy et al., 2008; Fiske et al., 2002) has shown that people may also conceal their negative sentiments toward groups by evaluating them ambivalently along the warmth and the competence dimension. Chapter 3 investigates whether individual differences in need for affect (NFA) and in need for cognition (NFC) reduce this ambivalence by predicting more positive attitudes toward certain types of groups along these dimensions (Wolf, Maio, & von Hecker, 2015). In particular, people higher in NFA have been shown to actively seek out and enjoy emotionally evocative stimuli and events (Appel & Richter, 2010; Bartsch, Appel, & Storch, 2010; Maio & Esses, 2001). Given that warmth has an emotional aspect, as explained in Chapter 3, people higher in NFA may be more sensitive to perceptions of a group's warmth. For completeness, I also tested the individual difference variable need for cognition (NFC). People higher in NFC have been shown to actively seek out and enjoy cognitively challenging stimuli and situations (Cacioppo & Petty, 1982; Cacioppo, Petty, & Morris, 1983). Given that competence has a cognitive aspect, as explained in Chapter 3, people higher in NFC may be relatively more sensitive to perceptions of a group's competence. Hence, this series of studies tested whether individual differences in NFA and NFC predict more

positive attitudes toward groups varying along the dimensions warmth and competence. Moreover, I also assessed whether the groups were perceived as expected along these dimensions. Finally, this research program examined directly which role warmth plays in this mechanism.

To conclude the dissertation, Chapter 4 summarizes the findings across both research programs and discusses the conclusions that arise from them. Whereas Chapter 2 employed designs that indirectly tested whether warmth improves intergroup attitudes, Chapter 3 provides stronger evidence for a mechanism involving warmth because the experiments in this chapter examined warmth more directly. This final chapter explores the idea that warmth is the systematic factor behind the mechanisms presented in this dissertation and reconsiders the limitations of the designs as they stand, along with potential avenues for future research. The chapter closes by considering how such effects of warmth to improve intergroup attitudes may be theoretically and practically significant.

Chapter 2

Implicit Racial Prejudice Against Infants

Chapter 2 Summary

Because of the innocence and dependence of children, it would be reassuring to believe that implicit racial bias against children is lower than implicit racial bias against adults. This belief would also fit the assumption that children are seen as being higher in trait warmth than adults, which may make children less threatening and less applicable as targets of prejudice. Yet, prior research has not directly tested whether or not adults exhibit more positive spontaneous racial attitudes toward child targets than adult targets. Three studies addressed this issue, contrasting adults with very young child targets. Study 1A and 1B revealed that participants belonging to an ethnic majority group (White Europeans) showed greater spontaneous favorability toward their ethnic in-group than toward an ethnic out-group (South Asians), and this bias emerged equally for infant and adult targets. Study 2 found that this pattern occurred even when race was not a salient dimension of categorization in the implicit measure. Overall, then, there was a robust preference for in-group children over out-group children, and there was no evidence for this bias to be weaker than that exhibited toward adults. Thus, these studies revealed no support for the hypothesis that out-group warmth can improve spontaneous racial attitudes.

The literature described in the previous chapter suggests that the warmth of a significant other can improve racial attitudes on an explicit level, but may be less effective on a behavioral measure (Mikulincer & Shaver, 2001; Wolf, Karremans, et al., 2015). The present chapter extends this evidence by examining a novel source of warmth and testing whether it can improve racial attitudes on an implicit level. In particular, I tested whether people express more positive racial attitudes toward infants and children than toward adults, based on the stereotypically higher warmth in children (Alley, 1983; Berry & McArthur, 1985; Glocker et al., 2009; McArthur & Apatow, 1984; Oosterhof & Todorov, 2008).

Racial Prejudice Against Children

It is often assumed that people are more positive toward out-group children than toward out-group adults. Around the world, children frequently appear in campaigns to elicit donations for victims of famine, disease, and natural disaster (e.g., “Gaza Children’s Crisis,” n.d.). Similarly, to receive more money from passers-by, beggars often bring their children to the streets in a pitiful state (Keenan, 2013). The implicit assumption may be that, compared to adults, children elicit greater sympathy (Keenan, 2013), which can help to short-circuit any negative sentiments; these negative sentiments can be substantial when the individuals being helped are members of other ethnic, religious, or national groups (Dovidio et al., 2002; McConnell & Leibold, 2001). Indeed, children appear frequently in campaigns against prejudice (e.g., “Race discrimination poster,” n.d., “‘Your skin color. Shouldn’t dictate your future’ – Campaign against racism and anti-semitism,” 2010). Thus, whether it is an appeal for donations to help people in impoverished nations or a campaign against racism, children are often used to elicit sympathy in the hope to combat prejudice.

This use of child targets broadly fits evidence that children are seen as innocent and in need of protection (Goff, Jackson, Di Leone, Culotta, & DiTomasso, 2014;

Lampinen & Sexton-Radek, 2010). In a similar vein, adults with more neonatal facial features have been shown to be perceived as warmer, kinder, more trustworthy, and more honest than adults with less neonatal facial features (Berry & McArthur, 1985; McArthur & Apatow, 1984; Oosterhof & Todorov, 2008), and it has been found that neonatal facial features elicit protective behaviors and motivations for caretaking (Alley, 1983; Glocker et al., 2009). As a result, children belonging to an ethnic out-group may be seen as warmer and hence more positively than out-group adults.

But do we actually exhibit less *prejudice* against out-group children than against adults: could the preference for the in-group over the out-group be weaker for children than for adults? Even if children per se elicit more positive responses, regardless of their group membership, it could still be the case that in-group children are preferred to out-group children. This preference could remain even though attitudes to both child groups are more positive than attitudes to both adult groups. Indirect support for the prediction that prejudice is an important factor even when out-group children are considered comes from research showing that ethnic out-group facial features may spontaneously trigger prejudicial responses. Specifically, Blair, Judd, and Chapleau (2004) found that prison inmates with more Afrocentric facial features received harsher sentences than those with less Afrocentric facial features and that the judges were unaware of this influence. This finding fits the view that facial features typical for an out-group may lead to a spontaneous activation of the stereotypes and prejudice associated with that group. If out-group features are also visible in neo-natal faces, then child out-group members' facial features may spontaneously elicit a prejudiced response, short-circuiting any emotional mechanisms related to the elicitation of warmth or sympathy in child targets. Consequently, the relative roles of out-group features and neonatal features are difficult to prefigure. It is not yet clear whether they co-exist

independently from each other and exert a similar influence on evaluations and behaviors or counteract each other.

There is provocative evidence that partially addresses this question and suggests that out-group features may play a more important role than child features. For example, in a study by Goff et al. (2014), White participants saw criminal suspects who were Black children as less innocent, more culpable, and as older than criminal suspects who were White children. Importantly, this appeared to be the case only for targets who were 10 years or older. For younger targets, participants did not perceive a difference in innocence between Black and White children. Moreover, the extent to which participants evaluated Black children as less innocent and older than White children was predicted by how strongly they dehumanized Black people, but not by their explicit or implicit prejudice. Hence, although this study shows that out-group features play a dominant role in the perception of out-group children's innocence, this seemed to apply only to older children.

Moreover, in an earlier study, Downey and Pribesh (2004) showed that White teachers, as compared to Black teachers, rated Black kindergartners and eighth graders as displaying poorer classroom behavior than White students. This indicates that out-group members become victims of prejudice already at a very early age. In a similar vein, Baron and Banaji (2006) presented child and adult participants with self-report measures of prejudice and an implicit measure of prejudice against child targets. Results indicated that prejudice decreased with age of the participant on an explicit self-report measure, whereas the implicit preference for in-group children over out-group children was similarly strong within 6-year olds, 10-year olds, and adults. This study has drawn attention to the presence of prejudice *in* children and the way in which spontaneous prejudice (as assessed in the implicit measures) is maintained at adulthood while explicit self-reports of prejudice decrease. Nonetheless, all of these studies leave

unanswered the question of whether or not adults exhibit *improved* racial attitudes toward child targets than toward adult targets, because the studies did not test whether racial attitudes toward out-group children significantly differed from racial attitudes toward out-group adults.

The Present Research

To address this issue, the present research tested whether adults' spontaneous racial attitudes toward children differ from their spontaneous racial attitudes toward adults. I focused on spontaneous racial attitudes, as opposed to consciously endorsed, self-reported attitudes. I expected that the high social undesirability of admitting racial prejudice, which may be even more marked in the case of child targets, makes it unlikely that explicit measures of prejudice will be sensitive to the existence of prejudice against racial and child targets. At the same time, obtaining knowledge about adults' spontaneous racial attitudes is important because it may influence many behaviors toward out-group children, including small behavioral slights with large ramifications (e.g., dismissiveness, exclusion). Such subtle, spontaneous victimization of out-group children may be one of the hardest forms of prejudice to detect, especially in settings where the children's parents cannot witness the subtle slights they may receive from other adults (e.g., in schools, shops, sports clubs). Moreover, adults cannot always be there to help the children interpret, and cope with, their situations.

I conducted three studies (1A, 1B, and 2) examining spontaneous prejudice against both child and adult targets. White European participants were selected who constitute the majority group in the United Kingdom, where the research was conducted. Participants belonging to the racial majority group were recruited because spontaneous in-group preferences have been demonstrated reliably for such groups, whereas the spontaneous preferences of racial minority group members are more varied (Nosek, Banaji, & Greenwald, 2002; Rudman, Feinberg, & Fairchild, 2002). The

studies used White European in-group and South Asian out-group targets, because people of South Asian (e.g., Indian, Pakistani, Bangladeshi) descent are the largest racial minority group in the United Kingdom (“2011 Census: KS201EW Ethnic group, local authorities in England and Wales,” 2012). In addition, the studies included very young children as targets (i.e., babies, toddlers). Previous research showed that younger children were perceived as more innocent than older children, and equally so for in-group and out-group children (Goff et al., 2014). Moreover, I selected very young children as targets to ensure that the facial characteristics were quite distinct from those of adults. To robustly examine implicit prejudice, the studies also included different sets of images, different variants of the implicit measure, relevant control variables (e.g., facial attractiveness), and potential moderators (i.e., implicit attitude to children per se).

Based on previous research, which showed that racial prejudice against children does exist (Baron & Banaji, 2006; Downey & Pribesh, 2004), I hypothesized that racial prejudice would be evidenced for both infant and adult targets. The expected existence of prejudice for both groups worked against the hypothesis that participants’ spontaneous racial attitudes would be improved for child targets, compared to adults, based on the conceptual importance of warmth as a deterrent to prejudice. These conflicting hypotheses made it important to empirically examine the question.

Study 1A

Study 1A examined whether spontaneous racial prejudice is lower toward children than toward adults. Participants were presented with pictures and names of children or adults from the in-group and from the out-group within the Implicit Association Test (IAT; Greenwald et al., 1998). Baron and Banaji (2006) had presented this test using faces of four Black children and four White children substituted for faces of Black adults and White adults. In a similar way, the present research assessed

participants' spontaneous favorability toward four sub-groups: South Asian infants, European White infants, South Asian adults, and European White adults. The present studies used two commonly employed types of IATs. One IAT used pictures of South Asian and European White targets, and the other IAT used South Asian names and European White names. The use of both methods made it possible to test for convergence of the conclusions across both procedures. As described above, I expected that participants would exhibit spontaneous racial prejudice toward adult and child targets.

Method

Participants and procedure. One hundred and thirteen psychology students (112 women; 18 - 48 years, $M = 19.61$ years) of White European descent took part for course credit at Cardiff University. One hundred and nine participants self-identified as British and four participants self-identified as Eastern European. Three participants of Asian descent were excluded, but the same effects were obtained when these participants were retained in the analyses.

When participants arrived in the lab, they completed an image-based South Asian-European White IAT followed by a name-based South Asian-European White IAT. Either participants saw images and then names of South Asian and European White infants or they saw images and then names of South Asian and European White adults. This ordering ensured that children were salient during both the child-focused, image-based IAT and the child-focused, name-based IAT. Hence, for both IATs in combination, participants were randomly assigned to the between-participants conditions of child targets or adult targets.

IATs. The two race IATs presented six positively and six negatively valenced words (e.g., love, fun, war, hate). The first, image-based, IAT employed eight photos of infant targets and eight photos of adult targets. In the second, name-based, IAT, the

pictures were replaced with eight common South Asian or White European names. Both IATs comprised three practice blocks containing 20 trials each and two test blocks containing 40 trials each. In these trials, participants viewed the valenced words and pictures or names in the middle of the screen and identified them by race (i.e., Asian vs. White) or by valence (i.e., positive vs. negative), depending on the trial. Response-times to the test blocks were used to compute D-scores for each participant (Greenwald, Nosek, & Banaji, 2003), such that higher scores indicated less prejudice.

Child target condition. In the child target condition, the eight images in the image-based IAT included two pictures of White European babies, two pictures of South Asian babies (gender unclear), one picture of a White European male toddler, one picture of a South Asian male toddler, one picture of a White European female toddler, and another of a South Asian female toddler.

In the name-based IAT, four of the eight names were traditional Indian names (e.g., Raj, Kavita) and four were traditional British names (e.g., Chris, Jennifer). Participants were first given the eight names and told that they were names of children from a maternity ward. They were asked to indicate for each name whether it referred to an Asian or a White child. Also, as mentioned above, the image-based IAT was presented before the name-based IAT in order to make it easier for participants to imagine child targets.

Adult target condition. In the image-based IAT, the eight images included two pictures of South Asian men, South Asian women, White European men, and White European women. For the name-based IAT, participants in the adult condition were simply given the list of names and asked to indicate whether they refer to an Asian or a White person.

Power analysis. Previous research on racial prejudice reliably reveals large effect sizes (Cohen's $d > 0.8$) when using the IAT (Greenwald et al., 1998; McConnell

& Leibold, 2001; Nosek et al., 2002). Hence, for adult targets, I expected a large IAT effect size (Cohen's $d = 0.8$), which may be reduced for child targets. Given a recommended power of .80, the sample sizes of 55 in the adult condition and 58 in the child condition exceeded the required 15 participants per condition for one-sample t -tests.

To be of practical interest with high potential for replicability the effect size of the difference in levels of prejudice between the children and adults should be at least medium (Cohen's $d = .5$). Given a recommended power of .80, the sample sizes of 55 in the adult condition and 58 in the child condition remained marginally below the required 64 participants per condition for a medium difference in IAT D-scores. These calculations were obtained using g^* power (Faul, Erdfelder, Lang, & Buchner, 2007).

Results

Past research repeatedly finds significant racial bias in the IAT (Dovidio et al., 2002; Greenwald et al., 1998; McConnell & Leibold, 2001). Consistent with this evidence, a one-sample t -test on the image-based IAT showed that the participants' mean D-score across age conditions deviated significantly from zero ($M = -0.51$, $SE = 0.03$), $t(112) = -16.02$, $p < .001$, Cohen's $d = -1.51$. This pattern reflects more positivity toward White Europeans than South Asians. The mean D-score deviated significantly from zero for pictures of adults ($M = -0.56$, $SE = 0.04$), $t(54) = -14.88$, $p < .001$, Cohen's $d = -2.01$, and for pictures of infants ($M = -0.46$, $SE = 0.05$), $t(57) = -9.20$, $p < .001$, Cohen's $d = -1.21$. Moreover, the effect sizes were large in both cases, and there was no significant difference between the D-scores for infants and adults, $t(111) = -1.56$, $p = .12$, Cohen's $d = -0.15$. Hence, for both images of adults and infants, participants exhibited more spontaneous favorability toward White Europeans than South Asians.

For the name-based IAT, a one-sample t-test showed that participants' mean D-score was significantly below zero ($M = -0.51$, $SE = 0.03$), $t(112) = -15.14$, $p < .001$, Cohen's $d = -1.42$. This result again reveals more positivity to White Europeans than South Asians. As in the image-based IAT, participants' D-score deviated significantly from zero for adults ($M = -0.52$, $SE = 0.05$), $t(54) = -9.90$, $p < .001$, Cohen's $d = -1.33$, and infants, ($M = -0.51$, $SE = 0.04$), $t(57) = -11.54$, $p < .001$, Cohen's $d = -1.52$. There was no significant difference between the D-scores for infants and adults, $t(111) = 0.09$, $p = .92$, Cohen's $d = 0.01$, and, as shown above, there were large effect sizes for both age groups. Hence, for adult *and* infant targets, participants showed more spontaneous favorability toward White Europeans than South Asians.¹

Discussion

In line with the expectations, Study 1A found strong evidence of spontaneous racial prejudice even when the targets were infants. That is, White Europeans showed a spontaneous preference for their racial in-group over a South Asian minority out-group for both children and adults. These results were obtained regardless of whether the stimuli were images or words.

Study 1B

Study 1B used largely the same sample of participants as Study 1A (see Participants and Design section below), because Study 1A and 1B were appended to two different sessions of another, irrelevant study (with 1A in the first session and 1B in the second). Study 1B was designed to address several issues that were salient after Study 1A. The first aim was to examine the replicability of the findings of Study 1A using different photos, thereby assessing implicit prejudice using a third set of stimuli

¹ Based on Nosek et al.'s (2002) findings that female targets are spontaneously preferred over male targets, I conducted supplementary analyses in Study 1A, 1B, and 2 to test whether racial prejudice would be attenuated for female targets relative to male targets. Only Study 1B showed a moderation effect, such that racial prejudice was *lower* for male targets than for female targets, contrary to the expectations. Across the three tests, there was no consistent evidence for spontaneous racial bias to be dependent on the target's gender.

differing from the two sets used in Study 1A. Second, although Cunningham, Preacher, and Banaji (2001) demonstrated the stability of IAT effects for adult targets, I knew of no data examining the stability of IAT effects for child targets. Hence, the second aim was to assess the stability of people's spontaneous attitudes toward out-group children versus in-group children. Third, I explored whether the racial bias toward child targets would be attenuated in people with more positive spontaneous attitudes to children. Thus, this study tested whether individual differences in spontaneous attitude to children moderated the strength of the racial bias. Finally, in order to assess any pre-existing differences between pictures in the image-based IAT, participants rated all pictures on happiness and attractiveness.

Overall, I expected that the spontaneous race bias that was obtained in Study 1A regardless of the target's age would replicate and prove stable over time. Moreover, I hypothesized that the spontaneous race bias would occur irrespective of the rated happiness and attractiveness of the targets.

Method

Participants. Three weeks after Study 1A, 104 participants from Study 1A (103 women; 18 - 48 years, $M = 19.66$ years) took part in this study at Cardiff University for course credit. The participants were of White European descent: 99 participants self-identified as British and five participants self-identified as Eastern European. Three participants of Asian descent were excluded, but the principal results were unchanged by their inclusion in the analyses.

For a number of reasons, it was assumed that using largely the same sample in Study 1A and 1B would not lead to carry-over effects or raise suspicions about the study's purpose among participants. That is, because Study 1A was appended to a first session and Study 1B to a second session of another study, participants were not fully debriefed at the end of Study 1A and only expected to receive a debrief at the end of

Study 1B. Moreover, Study 1B occurred 3 weeks after Study 1A, it was presented as a new study without any mention of Study 1A, and Study 1A and 1B both formed part of a larger set of tests. Hence, I assumed that participants were naïve about the purpose of Study 1B and that they were unlikely to be influenced by their prior performance in Study 1A. Participants' feedback during the funnel-style debriefing supported these assumptions.

Procedure. Participants first completed an image-based Race IAT similar to that used in Study 1A, with either infant or adult targets. The only change was that it included eight more pictures of infant targets and eight more pictures of adult targets. Thus, in total, participants in the child condition were repeatedly presented with eight pictures of White European infants (two male and two female toddlers, four babies) and eight pictures of South Asian infants (two male and two female toddlers, four babies), whereas participants in the adult condition were repeatedly presented with eight pictures of White European adults (four women, four men) and eight pictures of South Asian adults (four women, four men).

The subsequent task was an IAT that implicitly assessed participants' attitude toward children versus adults in general. This measure was adopted from past research (Leygue, Maio, Gebauer, Karremans, & Webb, 2013) and was the same for all participants. This IAT had the same general structure as the Race IAT, but it presented words denoting the child category (e.g., toddler, baby) or the adult category (e.g., grown-up, adult) and positive or negative words. Participants classified the stimuli according to their age category or valence on each trial. D-scores were calculated for both IATs, as in Study 1A.

Finally, participants rated the pictures they saw in the image-based IAT on happiness and attractiveness. These ratings were made using 7-point scales from 1 (not at all) to 7 (very much).

Power analysis. Given a recommended power of .80, the sample sizes of 51 in the adult condition and 53 in the child condition remained below the required 64 participants per condition for a medium difference (Cohen's $d = 0.5$) in IAT D-scores. These calculations were obtained using *g*power* (Faul et al., 2007).

Results

Replication of Study 1A. As in Study 1A, a one-sample t-test across conditions on D-scores from the image-based IAT was significant ($M = -0.48$, $SE = 0.04$), $t(103) = -11.67$, $p < .001$, Cohen's $d = -1.14$. The direction of this effect indicates that participants exhibited more spontaneous favorability toward White Europeans than South Asians. Moreover, this effect was present for adult targets ($M = -0.52$, $SE = 0.04$), $t(50) = -11.51$, $p < .001$, Cohen's $d = -1.61$, and for infant targets, ($M = -0.44$, $SE = 0.07$), $t(52) = -6.48$, $p < .001$, Cohen's $d = -0.89$. There was no significant difference between D-scores for infant and adult targets, $t(102) = -0.99$, $p = .32$, Cohen's $d = -0.10$, and the effect sizes were again large for both age groups. These results replicate the findings of Study 1A, using an expanded set of stimuli in the IATs.

Correlation between Study 1A and 1B. To address the stability of IAT effects for child targets, I examined the correlation between D-scores on the image-based IATs from Studies 1A and 1B. This correlation revealed that the spontaneous racial bias toward child targets was moderately stable over three weeks, $r(51) = .52$, $p < .001$. Unexpectedly, the correlation was non-significant in the subsample that was presented with adult targets, $r(51) = .17$, $p = .24$.

Role of implicit child attitude. To address the third aim of this study, the IAT D-scores were regressed on the predictors target age (child vs. adult; dummy coded), the centered child-adult IAT scores, and their interaction. This analysis revealed no significant effects for target age, $t(100) = 1.01$, $p = .31$, $\beta = .10$, nor child-adult IAT scores, $t(100) = 1.25$, $p = .21$, $\beta = .13$. More relevant, there was no significant

interaction, $t(100) = -0.72, p = .47, \beta = -.07$. Thus, spontaneous attitudes to children in general did not moderate spontaneous racial prejudice to child vs. adult targets.

Picture ratings. To examine differences in target attractiveness and happiness, a 2 (target age: children vs. adults) x 2 (target race: White European vs. South Asian) mixed-model MANOVA was conducted on the attractiveness and happiness of the presented targets. This analysis revealed a significant main effect of target age on attractiveness, $F(1,102) = 24.31, p < .001, \eta^2 = .19$. The child targets were seen as more attractive ($M = 4.68, SE = 0.11$) than the adult targets ($M = 3.91, SE = 0.11$). The effect of target age on happiness was not significant, $F(1,102) = 0.60, p = .44, \eta^2 = .01$.

The main effect of target race was significant both for attractiveness and for happiness, $F(1,102) = 14.46, p < .001, \eta^2 = .12$; $F(1,102) = 20.97, p < .001, \eta^2 = .17$. Specifically, White European targets were seen as more attractive ($M = 4.45, SE = 0.09$) and happier ($M = 4.61, SE = 0.06$) than South Asian targets ($M = 4.15, SE = 0.09$; $M = 4.36, SE = 0.07$). The interaction between target race and target age was not significant for attractiveness, $F(1,102) = .00, p = .95, \eta^2 = .00$, but it was significant for happiness, $F(1,102) = 35.84, p < .001, \eta^2 = .26$. The simple effects of target age indicated that, for adults, White European targets were seen as happier ($M = 4.73, SE = 0.09$) than South Asian targets ($M = 4.15, SE = 0.10$), $F(1,50) = 50.75, p < .001, \eta^2 = .50$. Of importance, this effect was non-significant for child targets, $F(1,52) = 1.09, p = .30, \eta^2 = .02$.

Correction for picture ratings. It is plausible that the perceived difference in attractiveness between the White European and South Asian child targets is itself an indirect indicator of prejudice. Nonetheless, it was important to test whether the perception of greater attractiveness for the White European child targets than South Asian child targets was *necessary* to detect the Race IAT effect. To address this issue, a regression analysis was conducted with the algebraic difference between rated South

Asian and White European child attractiveness as a predictor of the child Race IAT effects. This analysis revealed that participants who rated the South Asian child targets as more attractive also revealed more spontaneous positivity toward them, $t(51) = 2.23$, $p = .03$, $\beta = .30$. More important, the intercept remained significant, $t(51) = -5.67$, $p < .001$, Cohen's $d = -0.79$, showing that the South Asian-White European child attractiveness ratings could not account for the child D-scores' significant deviation from zero. Another way of illustrating this is by examining the mean D-scores among those who rated the South Asian child images as *more* attractive than the White European child images. Even in this group, the D-scores were still negative and significantly different from zero, $t(24) = -2.70$, $p = .013$, Cohen's $d = -0.54$. Thus, differences in perceived target attractiveness are not sufficient to account for the spontaneous bias.

Discussion

With an expanded set of stimuli, Study 1B replicated White Europeans' spontaneous preference for their in-group over a South Asian minority out-group, even when the targets were infants. As in Study 1A, implicit prejudice was not attenuated for children. Second, participants' spontaneous prejudice was stable over time for child targets; hence, spontaneous prejudice against infants was again easy to detect and stable. Third, the results indicated that implicit prejudice was unaffected by whether participants spontaneously liked children or not, suggesting that evaluations of race *in children* are substantively different from judgments *of children*. Fourth, it is noteworthy that the spontaneous racial bias directed toward children emerged even though the White European and South Asian children were seen as being equally happy, and differences in perceived attractiveness of the children were unable to account for the spontaneous racial bias. Overall, then, the spontaneous racial bias against children was replicable, stable over time within individuals, unrelated to spontaneous attitudes

toward children, and not explained by perceived differences in target happiness and attractiveness.

Study 2

The evidence so far indicates a robust spontaneous racial bias, even when the targets are infants. However, it is conceivable that the relative salience of race plays a role in producing this IAT effect. That is, individuals can often be classified according to multiple categories (e.g., race, gender, age) at the same time, and research indicates that evaluations depend on the category to which people attend (Crisp & Turner, 2011; Mitchell et al., 2003; Smith & Zaraté, 1992). For instance, the targets' race may have been more salient and hence received more attention than the targets' age in the Race IATs in Studies 1A and 1B, because participants were asked to classify individuals in one of two racial categories, and this may have caused race bias to dominate in spontaneous responses. To circumvent the potential role of category salience in IAT effects, Study 2 used Single-Target IATs (ST-IATs), which examine the absolute spontaneous favorability toward a single group without contrasting it against another (Bluemke & Friese, 2008; Dotsch & Wigboldus, 2008). For example, by presenting South Asian children against no other target group, spontaneous responses can be driven by ethnicity, age, or both without constraint from the task. This way, it is possible to examine the interplay between race and age more directly and independently of the potential influence of category salience.

Moreover, Study 2 addressed another potential issue. Specifically, one potential factor behind IAT effects is the category labeling and not the individual stimuli (De Houwer, 2001). Hence, if participants only considered the categories "Asian" and "White", but not the adult or child stimuli, it would be unsurprising that Study 1A and 1B only found an effect of race and not of age. However, studies have shown that if stimuli are unitarily atypical for the respective category, e.g., positively

viewed Blacks, participants redefine the category and the IAT race effect is eliminated (Govan & Williams, 2004). Therefore, participants in Study 1A and 1B should have redefined the categories in the child IAT as “South Asian children” and “White European children” and shown a reduced IAT effect, if children are indeed unitarily positive. Nevertheless, in Study 2 this issue was addressed more directly with the ST-IATs, which allowed to eliminate the influence of category labels because the only target category label that participants view is ‘Faces’ (see Materials section below). Thus, any effects on the ST-IATs should be driven by participants’ spontaneously constructed categories based on the individual stimuli. Overall, I hypothesized, based on the findings in Study 1A and 1B, that participants would show spontaneous racial bias, regardless of the target’s age.

Method

Participants and design. For this study, a new sample of 88 psychology students (78 women; 18 - 26 years, $M = 19.21$ years) was selected from Cardiff University who took part for course credit. One participant of Asian descent was excluded, but the results were unchanged by retaining this person. The remaining participants were of White European descent. Participants were randomly assigned to complete ST-IATs for either White European or South Asian targets, with the age of these targets (child vs. adult) manipulated within-subjects.

Procedure. Participants completed two ST-IATs in counterbalanced order. Participants in the White European condition completed an ST-IAT assessing their spontaneous attitude toward White European infants and another ST-IAT assessing their spontaneous attitude toward White European adults. In contrast, participants in the South Asian condition completed an ST-IAT that assessed their spontaneous attitude toward South Asian infants and another ST-IAT that assessed their spontaneous attitude toward South Asian adults. This design was intended to make age the only salient

difference between the ST-IATs, thereby introducing more potential for the race bias to be reduced, especially for younger targets.

Materials. The ST-IATs used the same pictures and words as the IATs in Study 1B. The White European and the South Asian infant target groups each consisted of two male and two female toddlers and of four babies, whereas the White European and the South Asian adults target groups each consisted of four men and four women. Each ST-IAT consisted of three blocks of trials in total. The first block, the practice block, involved 16 trials of classifying adjectives as either positive or negative. The test blocks consisted of 36 trials each. In one of the test blocks, participants classified positive words and pictures showing the respective category (i.e., White European infants, White European adults, South Asian infants, or South Asian adults) with one key and negative words with the other key. In the other test block, participants classified negative words and pictures showing the respective category with one key and positive words with the other key. Better performance on the former block than on the latter block is assumed to reflect positive associations with the tested category (Bluemke & Friese, 2008; Dotsch & Wigboldus, 2008). In the test blocks, participants were only asked to categorize faces in addition to the evaluative words, so that no particular category (e.g., South Asian children) was made salient in the instruction. The order of the test blocks was counterbalanced. The results of the ST-IAT were examined using D-scores.

Power analysis. In a mixed-model ANOVA with two groups and two measurements, a medium interaction effect was expected, given a recommended power of .80. The sample size of 88 participants exceeded the required 64 participants. These calculations were obtained using g*power (Faul et al., 2007).

Results

A 2 (age of target) x 2 (race of target) mixed-model ANOVA was conducted on participants' ST-IAT D-scores, with target age as the within-participants factor and target race as the between-participants factor. This analysis yielded a non-significant main effect of target age, $F(1,86) = 1.13, p = .29, \eta^2 = .01$, but a marginally significant effect of target race, $F(1,86) = 3.43, p = .068, \eta^2 = .04$. Specifically, participants had a tendency to exhibit more spontaneous favorability toward White European targets ($M = 0.18, SE = 0.04$) than toward South Asian targets ($M = 0.07, SE = 0.04$). The one-sample t-tests for each target group revealed significant positivity to White European infants ($M = 0.24, SE = 0.04$), $t(41) = 5.69, p < .001$, Cohen's $d = 0.88$, and marginally significant positivity to White European adults ($M = 0.11, SE = 0.05$), $t(41) = 1.99, p = .053$, Cohen's $d = 0.31$. In contrast, D-scores did not deviate significantly from zero for both South Asian infants ($M = 0.06, SE = 0.05$), $t(45) = 1.17, p = .25$, Cohen's $d = 0.17$, and South Asian adults ($M = 0.09, SE = 0.06$), $t(45) = 1.38, p = .17$, Cohen's $d = 0.20$.

Crucially, the interaction was non-significant, $F(1,86) = 2.15, p = .15, \eta^2 = .02$. Thus, the greater favorability to White European than South Asian targets was equally evident for adult and very young child targets.²

Discussion

White European participants again showed more spontaneous favorability toward their in-group than toward a South Asian minority out-group, even when the targets were infants. Even though this effect was marginal ($p < .07$), I am confident in interpreting it because of the *a priori* hypotheses and the consistency with Studies 1A and 1B. Furthermore, it is interesting that this effect of race emerged even though

² For exploratory purposes, I also examined whether a spontaneous preference for female targets over male targets, as shown by Nosek et al. (2002), could be attenuated for child targets compared to adult targets. In a 2 (target gender: male vs. female) x 2 (target age: child vs. adult) repeated measures ANOVA, the main effects of gender and age were non-significant, $F(86) = 1.99, p = .16, \eta^2 = .02$; $F(86) = 1.14, p = .29, \eta^2 = .01$. Their interaction was also not significant, $F(86) = 0.46, p = .50, \eta^2 = .01$. Hence, there was no evidence of a spontaneous gender bias and this did not interact with the target's age.

Study 2 deliberately made age the only characteristic distinguishing the two ST-IATs that participants received, which should have made age more salient than race. In addition, participants showed this race effect although they were not presented with race category labels. Hence, participants used these race categories spontaneously based on the individual stimuli.

A useful feature of ST-IATs is that they are well suited to detecting differences between in-group favorability and out-group derogation. In this regard, it is interesting that, similar to other studies of implicit prejudice (e.g., Karpinski & Steinman, 2006), the preference for White Europeans over South Asians was driven by spontaneous in-group favorability, whereas the spontaneous attitude toward the out-group was neutral. More important, this pattern was at least as strong for infant targets as it was for adult targets. Thus, Study 2 suggests that the robust spontaneous racial bias toward children among the majority group members (i.e., White Europeans) emerges because of robust in-group favoritism, rather than persistent out-group derogation.

Chapter Discussion

Research Findings

To my knowledge, the present research provided the first direct comparison of spontaneous racial prejudice against child targets versus adult targets. Contrary to the notion that greater sympathy toward child targets than toward adult targets short-circuits racial prejudice against children, results revealed greater spontaneous favorability among majority group members to their racial in-group over a racial out-group even when the targets were infants. This effect occurred across different sets of verbal and pictorial stimuli and different implicit measures. Furthermore, the results of Study 2 revealed the locus of the effect; that is, the spontaneous racial bias is more attributable to robust in-group favoritism than to out-group derogation. Together, these findings challenge the notion that prejudice against children is lower than prejudice against

adults; spontaneous racial in-group bias is strong among majority group members even when very young targets are considered. Hence, although children are associated with warmth and warmth-related factors such as kindness and trustworthiness, the findings suggest that racial attitudes are not improved toward children on an implicit level.

Why is the spontaneous race bias so prevalent? On the one hand, it would seem to be at odds with perspectives that stress social learning and stereotypes in prejudice (Devine, 1989; Ehrlich, 1973); the babies in the present sample of targets were too young to be viewed as conforming to common stereotypes. In the time constraints imposed by the IATs, it also seems unlikely that people might spontaneously re-imagine children in the future. In addition, it is difficult to explain the results in terms of a general negativity bias, wherein our judgments tend to be more strongly influenced by negative items of information than by positive items of information (e.g., Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Ito, Larsen, Smith, & Cacioppo, 1998). Study 2 showed that the spontaneous racial bias toward child targets was more consistent with a difference resulting from in-group favorability than with a spontaneously negative response to the out-group racial category. Instead, the prevalence of a spontaneous race bias could indicate that people pay chronically more attention to race than to age as a consequence of their lifetime experiences with these categories (Smith & Zaraté, 1992). Together with the suggestion that more attention to one category tends to decrease attention to another (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), this may explain why spontaneous evaluations of racial out-group children are dominated by a race bias and why the perceived warmth of children does not exert an influence.

The finding that the spontaneous race bias may stem more from in-group favorability than out-group derogation is important because, as explained in the introduction, racial biases against children may lead to subtle, spontaneous

victimization (e.g., dismissiveness, exclusion), which is difficult to detect and difficult to cope with for the children. However, if the racial biases against children stem more from a *lack* of positive responses to out-group targets, then the effects on out-group children may be even more difficult to notice and counteract than if subtle negative reactions were evident.

Attempts at Replication

I conducted two additional studies not reported here that aimed to conceptually replicate the present findings with important methodological changes. These two additional studies were not discussed in the main body of the text because this research program concerned reducing spontaneous racial prejudice through the warmth of child targets, and, as shown below, both of the additional studies used paradigms that revealed no evidence of a racial bias that could be reduced. Thus, these studies are presented here primarily for completeness and to illustrate boundary conditions for eliciting spontaneous racial prejudice *per se*.

One of these studies tested whether a target's skin tone alone may be enough to elicit spontaneous racial bias for both adult and child targets. In this study, 37 participants completed four ST-IATs in a row that were similar to the ST-IATs used in Study 2. The targets were cartoon characters depicting children or adults with a light or a darker skin tone (i.e., akin to the White European and South Asian targets in the studies reported above). Hence, the four ST-IATs assessed participants' spontaneous attitude toward either childlike or adult cartoon characters with either a lighter or a darker skin tone. The results revealed non-significant effects for race, $F(1,36) = 0.20$, $p = .66$, $\eta^2 = .01$, age, $F(1,36) = 0.09$, $p = .77$, $\eta^2 = .00$, and their interaction, $F(1,36) = 0.31$, $p = .58$, $\eta^2 = .01$. The means differed significantly from zero in the direction of *positivity* toward all four targets. Hence, this additional study shows that cartoon characters were evaluated equally positive on an implicit measure, irrespective of their

skin tone or depicted age. This may indicate that a spontaneous preference for the racial in-group requires targets that are realistic or that specific facial features of the targets are present, which may trigger the learned associations and result in a spontaneous racial bias.

In the second additional study, I attempted to conceptually replicate the findings with another measure, the Affect Misattribution Procedure (AMP; Payne et al., 2005). The AMP builds on the assumption that the feelings elicited by presenting in-group or out-group targets can be misattributed by participants to subsequent neutral symbols. Hence, implicit racial prejudice is indicated if symbols following an out-group target are evaluated more negatively than symbols following an in-group target. In this additional study, 64 participants were either presented with images of South Asian adults and White European adults or with images of South Asian children and White European children. These images were the same as in Study 1B. Participants viewed each target four times, resulting in 32 images of South Asians, 32 images of White Europeans, and 32 grey squares as a neutral filler image. Following the presentation of these primes for 75ms, and after a blank screen for 125ms, participants saw a Chinese pictograph for 100ms. Finally, a pattern mask was shown until participants indicated whether the Chinese pictograph was more or less visually pleasing than average by pressing one of two keys. The proportion of pleasant responses to unpleasant responses was computed such that higher scores reflect more positivity toward the targets. The results showed no significant effects for race, $F(1,62) = 0.18, p = .68, \eta^2 = .00$, age, $F(1,62) = 0.98, p = .33, \eta^2 = .02$, or their interaction, $F(1,62) = 0.39, p = .53, \eta^2 = .01$. Hence, the AMP showed no evidence of a spontaneous racial bias, irrespective of the target's age, thereby not replicating the findings of the present research program and numerous other observations of spontaneous prejudice, including some obtained using the AMP (Guinote, Willis, &

Martellotta, 2010; Inzlicht, Gutsell, & Legault, 2012; Payne et al., 2005). It is not clear what may have caused this lack of evidence in the AMP for a spontaneous racial bias, which was surprisingly absent even for adult targets. Although the present studies have provided evidence across different implicit measures of prejudice, this additional study suggests that it may be fruitful for future research to test the present findings with other measures more thoroughly.

Limitations and Future Research

It is noteworthy that the power analyses revealed that the sample sizes of Study 1A and 1B were too small to find a medium-sized difference in racial bias between child and adult targets. Study 1A achieved a power of .75 and Study 1B achieved a power of .71, falling slightly short of the recommended power of .80. Nevertheless, the findings were consistent across both studies and they were consistent with Study 2 which exceeded the recommended sample size. Hence, despite these shortcomings in the sample size of Study 1A and 1B, Study 2 and the consistency across the studies support the validity of the present findings.

Future research could address the inevitable limitations of this first foray into the role of child targets in prejudice. For instance, the research samples included a bias toward female participants. Whereas Leygue et al. (2013) did not find any gender differences in spontaneous preference for children over adults, other research indicates that women are explicitly more positive toward children (Alley, 1983; Maestripieri & Pelka, 2002; Stöbel-Richter, Beutel, Finck, & Brähler, 2005). Moreover, Nosek et al. (2002) found that women reveal a lower spontaneous racial bias than men.

Notwithstanding the finding that the racial bias was equally present across male and female adults and child targets (see Footnote 1), the extant research may suggest that racial prejudice toward children would, if anything, be even higher in a participant

sample including more men. A replication with a more gender-balanced sample would help to further test the robustness and generalizability of the present findings.

In addition, although the present research provides a consistent demonstration of spontaneous racial prejudice among a sample of majority group members (i.e., White Europeans in the UK), it would be useful to examine spontaneous prejudice among minority group members. Research has shown that people's spontaneous preference for their racial in-group can be lower or even favor the majority group if the minority group's status in society is lower (Nosek et al., 2002; Rudman et al., 2002). Hence, it would be fruitful to examine whether racial minority group members show a similar spontaneous racial bias for both children and adults. Furthermore, the extent and direction of racial bias may depend on a range of other situational and individual factors. For example, it would be beneficial to test whether kindergarten teachers show the same amount of spontaneous racial bias toward children and adults. Future research could examine such effects using additional racial and ethnic groups beyond those included in the present studies.

Another limitation is that the perceived warmth of children was not assessed in the presented studies. The designs were built on prior evidence for stereotypes of children as being warm (which is confirmed in the next chapter), and it was intended to include measures of warmth *if* differences between child and adult targets emerged. However, it might also be the case that differences between child and adult targets are more likely among those who more strongly stereotype children as warm. This is another important question for future study.

Conclusions and Next Steps

Notwithstanding this need for further research, the present evidence makes clear that we cannot idealistically assume that people show improved racial attitudes toward infants from ethnic out-groups than they show to older members of the ethnic

out-groups. Hence, even though children are associated with warmth and warmth-related factors, and contrary to the notion that children as a warm target group would be perceived less negatively due to lower perceived threat and distance, spontaneous racial prejudice persisted. Although we might hope that prejudice is reduced for warm groups, race looms large in spontaneous reactions.

In combination with previous evidence that the warmth of a significant other reduced racial bias on some behavioral measures (Kraus et al., 2010) but not on others (Wolf, Maio, Karremans, et al., 2015), the evidence for an effect of warmth on more indirect measures is inconclusive. The next chapter presents studies that employed explicit measures of prejudice and tested whether the concealed negative sentiments in ambivalent attitudes can be reduced. Importantly, the following series of studies addresses a limitation of this chapter that warmth was only examined indirectly. That is, these studies assessed the perceived warmth of the presented groups and examined directly which role warmth plays in the improvement of intergroup attitudes. Moreover, another difference to Chapter 2 is the proposed mechanism underlying the prejudice-reducing effect of warmth. Specifically, whereas this chapter assumes that warmth would reduce the perceived threat of and distance to the out-group, the next chapter is based on the idea that warm groups are seen as more emotionally stimulating, which may be perceived more positively by some people.

Chapter 3

Affective and Cognitive Orientations in Intergroup Perception

Summary Chapter 3

To further examine the role of warmth in intergroup attitudes, four studies examined the role of Need for Affect (NFA) and Need for Cognition (NFC) in intergroup perception.

I hypothesized that NFA predicts higher favorability toward stereotypically warm groups than stereotypically cold groups, whereas NFC predicts higher favorability toward stereotypically competent groups than stereotypically incompetent groups.

Study 3 found that NFA and NFC predicted attitudes toward individuals from fictitious groups differing on warmth and competence, but did not influence attitudes toward the fictitious groups themselves. Study 4 did not show the expected pattern for various real groups, but indicated that the results may have been masked by social desirability effects. Studies 5 and 6 presented less socially sensitive real groups that elicit ambivalent stereotypes. The results revealed that people higher in NFA evaluated stereotypically warm and incompetent groups more positively than stereotypically cold and competent groups, whereas people higher in NFC evaluated the stereotypically cold and competent groups more positively than the stereotypically warm and incompetent groups. Moreover, Study 6 also provided evidence that evaluations of warmth and competence mediated these associations. The present research integrates and extends past evidence on attitude-relevant individual differences with research on stereotypes and intergroup perception, while showing that the role of perceived out-group warmth may be more complex than prior theory and research has indicated.

Chapter 2 examined a group that is a specific potential source of warmth, children. As discussed above, one limitation of this approach is that there was no explicit variation in the amount of warmth conveyed. Chapter 3 addressed this limitation, tested novel sources of warmth, and examined a hitherto untested way in which warmth may reduce prejudice. In particular, research on the stereotype content model (SCM; Cuddy et al., 2008; Fiske et al., 2002) shows that groups vary along the warmth and competence dimensions. The following four studies presented racial and non-racial groups that varied along these dimensions and examined whether individual differences in need for affect (NFA) are linked with attitudes toward warm groups relative to cold groups, based on the notion that people higher in NFA evaluate warmth more positively due to its relevance to emotional stimulation. For completeness, I also included need for cognition (NFC). Importantly, these studies tested warmth directly by assessing the perceived warmth of the presented groups and examining which role warmth plays in the improvement of intergroup attitudes.

Moreover, instead of using implicit measures to test the effects of warmth on intergroup attitudes, Chapter 3 examined explicit measures. In the light of the speculation in Chapter 2 that explicit measures may not detect prejudice toward socially sensitive groups such as out-group children, Chapter 3 attempted to reduce social desirability effects in two ways. First, the aim of this set of studies was not to directly contrast the in-group with an out-group, which conceivably increases social desirability concerns, but instead to present various groups and investigate (between participants) whether individual differences in NFA and NFC are associated with more positive attitudes toward some groups. Second, whereas racial out-group children may be a particularly socially sensitive group, and hence indirect measures are more suitable to detect prejudice, other groups are presumably less socially sensitive. Hence, the present set of studies aimed to present less socially sensitive groups such as housewives, South

American people, and also children. As a result, while employing explicit measures of intergroup attitudes, the present series of studies minimized the influence of social desirability on the outcomes.

Stereotype Content Model

The specific content of stereotypes differs greatly between various groups of people. For example, whereas Jewish people are seen as successful, strict, and stubborn by Americans, the elderly are seen as dependent and friendly (Cuddy et al., 2008; Madon et al., 2001). According to the stereotype content model (SCM; Cuddy et al., 2008; Fiske et al., 2002), this variability occurs along two dimensions of person perception and stereotype content: warmth and competence. As discussed in the General Introduction, warmth is claimed to be important in interpersonal and intergroup perception because it indicates a person's or a group's intention with regard to the self or the in-group. People and groups that are perceived as good-natured, tolerant, and friendly are seen as benefitting the self and the in-group, whereas people and groups that are perceived as less tolerant and friendly are seen as harming. Competence plays a role because it indicates the person's or group's capability to carry out these positive or negative intentions toward the self or the in-group. Competence subsumes attributes such as intelligence, confidence, and skillfulness.

The warmth and competence dimensions are similar to constructs developed by other researchers in person perception. For example, the terms agency and communion (Bakan, 1966), self-profitability and other-profitability (Peeters, 2002), and competence and morality (Wojciszke et al., 1998) have often been used interchangeably with competence and warmth. In addition, agency, communion, competence, and morality have been used in the domain of intergroup perception and stereotypes (Eagly & Steffen, 1984; Phalet & Poppe, 1997). Moreover, Abele and Wojciszke (2007) have

shown that these constructs overlap to a strong extent. Overall, there is strong support for warmth and competence as two central dimensions in stereotypes of groups.

According to the SCM, another important aspect of this structure is that groups can be organized into clusters, depending on where they fall on the perceived warmth and competence dimensions (Cuddy et al., 2008; Fiske et al., 2002). As can be seen in Figure 1, groups such as homeless people and welfare recipients are seen as scoring relatively low on both warmth and competence (LW/LC cluster), whereas participant in-groups and dominant majority groups (e.g., Whites, Christians in the US) are often seen as being relatively high on both dimensions (HW/HC cluster). Moreover, some groups are evaluated moderately on both dimensions (e.g., Hispanic people, gay men). Importantly, however, many, if not most social groups have been found to be evaluated in an *ambivalent* manner, with low evaluations on one dimension and high evaluations on the other dimension. For instance, whereas groups such as Asian people, rich people, and professionals are stereotyped in a category of high competence and low warmth (LW/HC cluster), the elderly and people with mental retardation are stereotyped in a category of high warmth and low competence (HW/LC cluster).

An interesting issue is how these stereotypes translate into attitudes toward those groups. According to the SCM, the focus on prejudice as a one-dimensionally negative attitude has obscured the finding that responses toward ambivalent groups can be positive and negative at the same time, depending on the group's perceived warmth and competence (Fiske et al., 2002). For example, as mentioned above, it has been shown that Asian people are simultaneously perceived positively on the competence dimensions and negatively on the warmth dimension, whereas the elderly are simultaneously perceived negatively on the competence dimension and positively on the warmth dimension. This way, people may conceal their negative sentiments toward a group by balancing negative views on one dimension with positive views on the other

dimension. However, research in interpersonal perception has shown that the relative salience of these dimensions, and hence perhaps the resulting attitude, depends on the situational context and on individual differences. For example, in a study by Wojciszke (1994), participants interpreted ambiguous social behaviors more along the warmth dimension when the behaviors were presented from the observers' perspective and more along the competence dimension when the behaviors were presented from the actors' perspective. Moreover, Wojciszke et al. (1998) showed that female participants emphasized the warmth dimension more than male participants. Overall, this suggests that the situational context and individual differences may also play a role in the perception of stereotypes about groups, and if so, it could have implications for the resulting attitude. For instance, for Asian people, a stronger emphasis on their stereotypically high competence could result in a more positive attitude and hence lower prejudice, whereas a stronger emphasis on their stereotypically low warmth could result in a more negative attitude and hence more prejudice. The present research builds upon the SCM by proposing that there are important individual differences in how the warmth and competence of groups is perceived, and consequently, how the groups are evaluated.

Need for Affect and Need for Cognition

The present research considers two individual difference variables that may be relevant to the warmth and competence dimensions: need for affect (Maio & Esses, 2001) and need for cognition (Cacioppo & Petty, 1982; Cacioppo, Petty, Feinstein, & Jarvis, 1996). The need for affect (NFA) has been defined as people's general motivation to approach or avoid situations and activities that are emotion-inducing for themselves and for others. This includes the desire (or aversion) to experience and understand one's own and others' emotions. As a result, people high in NFA can be expected to actively seek out and immerse themselves in emotionally evocative stimuli

and events, as documented by different strands of evidence. For example, Maio and Esses (2001) found that people with a high level of NFA indicated a greater preference to view emotional films over unemotional films and they listed a greater number of emotions, behaviors, and beliefs about a sad emotional event (i.e., Princess Diana's death) compared to people with a low level of NFA. Moreover, people high in NFA have been shown to immerse themselves more readily in a fictional world and they gave a more positive evaluation of emotions in general than people low in NFA (Appel & Richter, 2010; Bartsch et al., 2010).

Need for cognition (NFC) on the other hand, has been defined as people's tendency to engage in and enjoy effortful cognitive activity (Cacioppo & Petty, 1982). Hence, people high in NFC can be expected to seek out and enjoy situations that are cognitively challenging. For example, Cacioppo and Petty (1982) showed that, after completing a simple and a complex number-circling task, people high in NFC preferred the complex task, whereas people low in NFC preferred the simple task. Similarly, people high in NFC tended to elaborate more extensively on information provided to them and they were more influenced by the strength of arguments than people low in NFC (Cacioppo et al., 1983).

NFA and NFC have been examined simultaneously in previous research. For instance, it was found that NFA more strongly predicts persuasion from cogent persuasive messages that have an affective focus, whereas NFC more strongly predicts persuasion from cogent messages with a cognitive focus (Haddock, Maio, Arnold, & Huskinson, 2008). These findings indicate that people with a high level of NFA are attuned to affective information in their environment and that people with a high level of NFC are attuned to cognitive information in their environment. Importantly, given that warmth has an affective aspect because it contrasts traits such as sentimental and humorous with traits such as unsociable and unhappy (Rosenberg et al., 1968), and

taking into account that NFA predicts liking of affective and emotionally stimulating situations and events (Bartsch et al., 2010; Maio & Esses, 2001), people higher in NFA may favor warmth over competence. Similarly, given that competence has a cognitive aspect because it contrasts traits such as scientific and imaginative with traits such as naïve and unintelligent (Rosenberg et al., 1968), and taking into account that NFC predicts liking of cognitively challenging situations and events (Cacioppo & Petty, 1982), people higher in NFC may favor competence over warmth. Consequently, if individual differences in NFA and NFC predict people's attunement to and preference for warmth or competence, this may have implications for people's attitudes toward groups. That is, NFA may predict people's attitudes toward groups varying on the warmth dimension because a group that is perceived as warm is more emotionally stimulating than a group that is perceived as cold. Accordingly, NFC may predict people's attitudes toward groups varying on the competence dimension because a group that is perceived as competent is more cognitively stimulating than a group that is perceived as incompetent. Hence, overall, people higher in NFA should be more favorable toward stereotypically warm groups than toward stereotypically cold groups. Conversely, people high in NFC should be more favorable toward stereotypically competent groups than toward stereotypically incompetent groups.

There has been previous work on interpersonal perception that supports these hypotheses. First, Hill (1991) showed that people higher in need for emotional support indicated more interest in interacting with a warm person than with a cold person, whereas people lower in need for emotional support showed no difference in interest. These findings suggest that people with a need for emotional support are sensitive to differences in warmth and that higher warmth is perceived as more emotionally stimulating than lower warmth in an interpersonal context. Moreover, and of particular relevance to the present study, a recent set of experiments by Aquino, Haddock, Maio,

Wolf, and Alparone (2015) showed that NFA and NFC predict attitudes at an *interpersonal* level. In one study, the researchers presented participants with four fictitious individual targets who were described as warm, cold, competent, or incompetent, respectively. The results indicated that people higher in NFA evaluated warm targets more positively than cold targets, but did not show a difference in the evaluation of competent and incompetent targets. Conversely, people higher in NFC evaluated competent targets more positively than incompetent targets, but did not show a difference in evaluation of warm and cold targets. Moreover, in a second experiment, the authors provided evidence that individuals high in NFA accentuated differences in evaluations of warm and cold traits, whereas individuals high in NFC accentuated differences in evaluations of competent and incompetent traits. These findings support the notion that NFA predicts more extreme evaluations along the warmth dimension, presumably because high warmth is perceived as emotionally stimulating. On the other hand, NFC predicts more extreme evaluations along the competence dimensions, presumably because high competence is perceived as cognitively challenging. Taken together, this suggests that group targets may show a corresponding pattern of associations with NFA and NFC.

However, whether these findings on interpersonal perception can be extrapolated to the domain of intergroup perception remains an important, separate question. This question is important because a number of additional processes are likely to become relevant when groups are the targets of judgment, instead of individuals, and hence it cannot be assumed that the same principles apply to intergroup perception. For instance, Aquino et al. (2015) presented information on either warmth or competence for a given individual. However, as discussed above, groups are usually stereotyped on *both* the warmth and the competence dimensions, and often elicit ambivalent stereotypes (e.g., high in warmth and low in competence). Hence, it may be the case

that, although Aquino et al. (2015) found that there were no cross-over effects (i.e., NFA not predicting the evaluation of targets varying on competence and NFC not predicting the evaluation of targets varying on warmth), having information on both dimensions simultaneously may change people's evaluation of the targets. In addition, people may differ in the extent to which they know the common stereotype of the groups on warmth and competence, spontaneously activate these stereotypes when encountering the group, and weight the stereotype in their attitudinal judgment (e.g., due to differences in the endorsement of the stereotype). Furthermore, the desire to appear unprejudiced may attenuate any inclinations toward negative evaluations. The role of the desire to appear unprejudiced is particularly relevant for NFC; past evidence indicates that people higher in NFC exhibit more socially desirable responding (for an overview, see Cacioppo et al., 1996) and lower explicit prejudice (Waller, 1993). Nonetheless, because stereotypes about groups can be well-learned and embedded in a rich context of other associations and personal experiences (Smith & DeCoster, 2000), the perception of groups may also evoke strong impressions and evaluations.

In addition to providing evidence for the extent to which Aquino et al.'s (2015) findings can be extrapolated to the intergroup domain, the present series of studies may provide interesting real-world implications for prejudice. That is, the results of the present findings could indicate that some people show more positive attitudes toward certain groups, which could be applied effectively in interventions and anti-racism campaigns. For example, accentuating the high warmth of a group could lead people higher in NFA to express more positivity toward this group, whereas accentuating the high competence of a group could lead people higher in NFC to be more positive toward the group. Such interventions may be most useful when information about groups and group members can be personalized and tailored to people's profile, for instance online or in a personalized workplace diversity program. This way, racial

prejudice may be reduced for certain groups, depending on people's level of NFA and NFC.

The Present Research

The present chapter describes four studies examining the roles of NFA and NFC in intergroup attitudes. These four studies presented groups that belong to the different clusters identified by the SCM. Study 3 examined how people differing in NFA and NFC evaluated fictitious groups that were described in terms linking them with one of the SCM's four clusters (i.e., HW/HC, HW/LC, LW/HC, and LW/LC). Study 4 tested the evaluation of real groups belonging to these four clusters. The fifth study narrowed the set of target groups down to ambivalent groups (i.e., HW/LC and LW/HC) and also tested whether the groups were perceived as expected along the warmth and competence dimensions. Finally, Study 6 aimed to replicate the findings of Study 5 and provided evidence for the mechanism underlying the associations between NFA and NFC and attitudes. I expected that people higher in NFA feel more positive toward stereotypically warm groups (i.e., HW/HC groups, HW/LC groups) than toward stereotypically cold groups (i.e., LW/HC groups, LW/LC groups), whereas people high in NFC feel more positive toward stereotypically competent groups (i.e., HW/HC groups, LW/HC groups) than toward stereotypically incompetent groups (HW/LC groups, LW/LC groups).

Study 3

Building on the research design used by Aquino et al. (2015), Study 3 investigated how fictitious groups were evaluated by people differing in NFA and NFC. Because the SCM has shown that groups commonly fall into one of four clusters, HW/HC, HW/LC, LW/HC, or LW/LC, participants were presented with fictitious groups described according to these clusters. In addition, this study investigated how people differing in NFA and NFC evaluated individuals belonging to these groups. I

expected that people higher in NFA would evaluate HW/HC and HW/LC groups and group members more positively than LW/HC and LW/LC groups and group members. In contrast, I expected that people higher in NFC would evaluate HW/HC and LW/HC groups and group members more positively than HW/LC and LW/LC groups and group members.

Method

Participants. One hundred and three undergraduate students from Cardiff University signed up for an online survey. Six participants failed the Instructional Manipulation Check (IMC; Oppenheimer, Meyvis, & Davidenko, 2009; see below) twice and were excluded from further participation in the survey. This left 97 participants (86 women, 7 men, 4 did not report sex; $M_{\text{age}} = 19.50$; 88 of British nationality, 7 of other European nationalities, 2 of Asian nationalities) for analysis. Participants received course credits for their participation.

Procedure. First, an Instructional Manipulation Check (Oppenheimer et al., 2009) was presented in order to screen out participants who did not read the instructions carefully. In this manipulation check, text at the top of the screen is followed by a question. However, the text at the top of the screen instructs participants not to answer the question, but instead to confirm that they have read the text. If participants failed to provide the confirmation, they were presented with a warning and the IMC again.

After the IMC, participants were presented with a fictitious group belonging to one of the four clusters (i.e., HW/HC, HW/LC, LW/HC, or LW/LC). Participants were given the name of the fictitious group (i.e., *Leptons*, *Kemmens*, *Rhinians*, or *Nerants*, respectively) and a description of the group. The instructions stated that this description was based on characteristics of a real group. Participants were asked to read the description carefully and form a vivid impression of the group in order to answer questions about the group afterwards. Each of the four descriptions contained 10

attributes in total: five competence-related attributes (e.g., *competent*, *intelligent* for the high-competence groups; *incompetent*, *lazy* for the low-competence groups) and five warmth-related attributes (e.g., *warm*, *affectionate* for the high-warmth groups; *cold*, *reserved* for the low-warmth groups). Each description contained either the attribute *competent* or *incompetent* as well as the attribute *warm* or *cold*. The remaining attributes were unique for each group description. From the 36 attributes, I selected 23 on the basis of (Rosenberg et al., 1968) evidence of their relevance to high warmth, coldness, competence, or incompetence. The other 13 attributes were adopted on the basis of Abele and Bruckmüller's (2011) suggestion that these also reflect warmth, coldness, competence, or incompetence (see Appendix for the full list).

On the subsequent page, participants were asked to provide a two-sentence summary of the group. This task was included in order to actively engage participants in the descriptions of the groups and to stimulate them to form a vivid impression of them. Next, participants used an evaluation thermometer (Haddock, Zanna, & Esses, 1993) to indicate how favorable they felt toward the group. The thermometer employed a 101-point scale from 0° (*extremely unfavorable*) to 100° (*extremely favorable*).

Following this, participants were asked to imagine that they would meet an individual belonging to the group. They were given the name of that group member (i.e., *James*, *David*, *Frank*, *Steve*) and then asked to what extent they would like him, how interested they would be to meet and spend time with him, and how willing they would be to help him out. In addition, participants completed the Inclusion of the Self in the Other scale (IOS-scale; Aron et al., 1992), which assesses the amount of perceived closeness to the target person. These five questions were averaged for each group to form a measure of favorability toward the group members (all α s > .78).

Participants followed this procedure for all four groups (in counterbalanced order). The combinations of group type, group name, and individual target name was

always fixed (e.g., for all participants the HW/LC group was the *Kemmens* and the corresponding target was *David*).

After the descriptions and evaluations of the groups and group members, participants completed measures of NFA and NFC. To measure NFA, I used the short 10-item version by Appel, Gnambs, and Maio (2012). Participants responded to statements such as “*I feel that I need to experience strong emotions regularly*” and “*I find strong emotions overwhelming and therefore try to avoid them*” (reverse scored) on a 7-point scale from *totally disagree* to *totally agree*. NFC was measured with the short 18-item version, which comprises such statements as “*I find satisfaction in deliberating hard and for long hours*” and “*Thinking is not my idea of fun*” (reverse scored; Cacioppo, Petty, & Kao, 1984). Participants responded on a 5-point scale from *extremely uncharacteristic of me* to *extremely characteristic of me*. Both the NFA scale and the NFC scale exhibited good internal consistency ($\alpha = .86$ and $\alpha = .88$, respectively).

Power analysis. In the study by Aquino et al. (2015), NFA and NFC predicted the evaluation of individual targets along the warmth and competence dimension with a medium effect size ($\beta = .30$). Based on these findings, I expected a similar effect size for the evaluation of groups. In regression analyses, with a recommended power of .80 and two predictors, the required sample size is 82 participants for each predictor. Hence, the present sample size of 97 participants was sufficiently large. These calculations were obtained using *g*power* (Faul et al., 2007).

Results

Data preparation. Table 2 shows the descriptive statistics of the favorability ratings toward the four groups and the four group members. I averaged the evaluations of the two warm groups (i.e., HW/HC, HW/LC) and the evaluations of the two cold groups (i.e., LW/HC, LW/LC) and computed a warmth difference score, such that

higher scores reflected more favorable attitudes toward warm groups than cold groups. Similarly, I averaged the evaluations of the two competent groups (i.e., HW/HC, LW/HC) and the evaluations of the two incompetent groups (i.e., HW/LC, LW/LC) and computed a competence difference score such that higher scores reflected more favorable attitudes toward competent groups than incompetent groups. Similar warmth and competence difference scores were computed for the evaluations of group members.

Group evaluation. In two separate analyses, the warmth and competence difference scores for groups were regressed on the simultaneously entered predictors NFA and NFC. These analyses showed that NFA did not predict the warmth difference score, $\beta = .11$, $t(94) = 1.10$, $p = .28$, and that NFC did not predict the competence difference score, $\beta = .09$, $t(94) = 0.82$, $p = .41$. Thus, summary evaluations of the fictitious groups were not related to the individual difference constructs (Table 3 shows NFA and NFC associations with the four types of groups).

Group member evaluation. In two separate analyses, the warmth and competence differences scores for group members were regressed on the simultaneously entered predictors NFA and NFC. These analyses found that participants higher in NFA showed a more positive evaluation of individual members of the warm groups than of the cold groups, $\beta = .21$, $t(94) = 2.06$, $p = .043$, whereas participants higher in NFC showed a more positive evaluation of individual members of the competent groups than of the incompetent groups, $\beta = .22$, $t(94) = 2.16$, $p = .034$. (Table 3 shows NFA and NFC associations with the four group members.)

Discussion

Study 3 showed no associations between NFA and NFC and the evaluation of fictitious groups varying in warmth and competence. However, the pattern was different when looking at the evaluation of individual group members. People higher in NFA evaluated warm group members more favorably than cold group members,

whereas people higher in NFC evaluated competent group members more favorably than incompetent group members. Hence, the associations between NFA, NFC, and the evaluations of group members were consistent with the predictions.

These results suggest that a similar mechanism as the one identified by Aquino et al. (2015) for individual targets applies to the evaluation of group members, but not to attitudes toward the groups to which they belong. One potential explanation for this difference is that fictitious groups may not be concrete enough to be perceived as emotionally or cognitively stimulating. That is, because groups are a collection of individuals, they are inherently more abstract than individual targets. Moreover, Hamilton and Sherman (1996) argue that the main difference between the perception of individuals and groups is that groups are generally perceived as less entitative or less as a coherent unit. According to the authors, this lower perceived coherence of groups compared to individuals leads to a number of differences between findings in person and group perception. For instance, when forming impressions of groups, information is processed less extensively (McConnell, Sherman, & Hamilton, 1994) and expectancies are formed less easily compared to when forming impressions of individuals (Weisz & Jones, 1993). Hamilton and Sherman (1996) took these findings also as support for the notion that the impression of groups is less spontaneous and less likely to be processed online. Thus, because groups are more abstract and perceived as less coherent than individuals, people may not have formed a concrete and vivid impression of the novel, fictitious groups. As a result, people with a high level of NFA and NFC may not have expected to be emotionally or cognitively stimulated. However, when the new information about a group is applied to individual group members, the targets of evaluation may be perceived as more concrete and coherent, and stimulate people's need for affect and need for cognition.

Overall, this suggests that the reason why the associations between NFA and NFC and the evaluation of the groups were not obtained in this study is that people find it difficult to form a concrete and vivid impression of fictitious groups. Therefore, Study 4 investigated whether real groups described in the SCM trigger the expected associations with NFA and NFC, because people do not need to form impressions of these groups and can base their impressions on the potentially rich underlying stereotypes for each group.

Study 4

Rather than using fictitious groups, Study 4 investigated how 20 real groups belonging to the SCM clusters (i.e., HW/HC, HW/LC, LW/HC, and LW/LC) are perceived by people differing in NFA and NFC. Participants were asked to indicate their attitude and desired social distance toward the groups. I hypothesized that participants higher in NFA would evaluate HW/HC groups and HW/LC groups more favorably than LW/HC groups and LW/LC groups. In contrast, I hypothesized that participants higher in NFC would evaluate HW/HC groups and LW/HC groups more favorably than HW/LC groups and LW/LC groups. For exploratory reasons, groups that are perceived moderately on both dimensions were also included.

Method

Participants. One hundred and twenty-three US American participants (74 men, 47 women, 2 did not report; 20 – 67 years of age, $M_{\text{age}} = 32.96$) were recruited online via Amazon's Mechanical Turk (www.mturk.com). All participants successfully completed the IMC (Oppenheimer et al., 2009) within the two attempts. The sample included 91 European Americans, 12 Asian Americans, 10 African Americans, five Hispanic Americans and five Middle Easterners or other. Participants received 1.20 US dollars for their participation, which took approximately 10 minutes.

Procedure. After completing the IMC (Oppenheimer et al., 2009), participants were shown 20 groups in total. According to the SCM, nine of these groups are stereotyped as being low on warmth and high on competence (LW/HC): Asian people, Chinese people, Japanese people, German people, rich people, Jewish people, professionals, British people, and feminists (Cuddy et al., 2009, 2008). Moreover, four groups were included that are stereotyped as being high on warmth and low on competence (HW/LC): the elderly, people with mental retardation, housewives, and people with physical disabilities (Cuddy et al., 2008; Fiske et al., 2002). In addition, children were included as a potential HW/LC group. I also selected groups that are evaluated moderately on both dimensions in the SCM, but which are often the target of prejudice: Black people, Hispanic people and gay men. In addition, this study included homeless people and poor people – two groups rated low on warmth and competence (LW/LC) – and American people, who are rated high on both dimensions (HW/HC).

As in Study 3, participants used an attitude thermometer (Haddock et al., 1993) to indicate how favorable they felt toward each group. Moreover, participants completed a social closeness scale for each group except children, for whom some of the distance items were inappropriate. In this social distance scale, participants were asked to what extent they would want to be close friends, friends, roommates, officemates, or an acquaintance of a typical member of each of the 19 groups (adopted from Bogardus, 1933). For housewives and homeless people, I omitted the question to what extent they would want to be officemates because this item was not applicable. Responses on the five questions were aggregated to form a composite score of social closeness for each target group (all α s > .93). Higher scores on the social closeness scale reflect more desired closeness to the target person.

After participants answered the attitude and social closeness items for all of the groups, the groups were presented in 10 pairs: children vs. Asian people, the elderly vs.

Chinese people, people with mental retardation vs. Japanese people, housewives vs. rich people, people with physical disabilities vs. feminists (all contrasting HW/LC with LW/HC groups), Black people vs. professionals, Hispanic people vs. British people, gay men vs. German people (all contrasting MW/MC with LW/HC groups), poor people (LW/LC group) vs. Jewish people (LW/HC group), American people (HW/HC group) vs. homeless people (LW/LC group). In response to each of these 10 pairs, participants indicated which group they preferred. In addition, participants were asked to imagine themselves in the company of a group member from each of these groups and to indicate who would be the more enjoyable interaction partner. Participants answered both questions using sliding scales from 0 (favorable toward left group) to 100 (favorable toward right group). Finally, participants filled in the two questionnaires to measure their level of NFA ($\alpha = .84$) and NFC ($\alpha = .96$).

Power analysis. It was conceivable that the real groups presented in this study would elicit the expected moderately strong associations. Hence, I expected a medium effect size ($\beta = .30$). In regression analyses, with a recommended power of .80 and two predictors, the required sample size is 82 participants. Thus, the present sample size of 123 participants was sufficiently large. These calculations were obtained using *g*power* (Faul et al., 2007).

Results

Data preparation. One participants who indicated ‘German’ as their nationality and one participant who indicated ‘Hispanic’ as their nationality were excluded because they had the same nationality as one of the target groups.^{3,4} Hence, 121 participants were retained for further analyses. Table 4 shows the descriptive statistics of the favorability ratings and social closeness ratings toward the groups. For both the

³ The main conclusions were the same when these participants were retained.

⁴ Participants of Asian American, African American, Hispanic American ethnicity were left in the analyses because they indicated their nationality in an open-ended question as ‘American’, instead of referring to their ethnic backgrounds. I considered participants’ self-identified nationality of greater importance for knowledge and endorsement of stereotypes than their ethnicity.

thermometer ratings and for the social distance measure, I computed an average for HW/LC groups, LW/HC groups, LW/LC groups, and moderately perceived groups. Moreover, I computed similar difference scores as in Study 3. For both the thermometer ratings and the social distance measure, the average across the stereotypically cold groups (LW/HC, LW/LC) was subtracted from the average across the stereotypically warm groups (HW/HC, HW/LC), and the average across the stereotypically incompetent groups (HW/LC, LW/LC) was subtracted from the average across the stereotypically competent groups (HW/HC, LW/HC). Higher scores on these warmth and competence difference scores reflect more favorability and more desired social closeness toward the stereotypically warm or competent groups than the stereotypically cold or incompetent groups.

Warmth and competence difference scores. The warmth difference score reflecting favorability and the warmth difference score reflecting social closeness were regressed on the simultaneously entered predictors NFA and NFC. NFA did not significantly predict the difference in favorability or desired social closeness between stereotypically warm and cold groups, $\beta = -.01$, $t(118) = -0.05$, $p = .96$; $\beta = -.01$, $t(118) = -0.13$, $p = .90$. Similarly, NFC did not predict the difference in favorability or desired social closeness between stereotypically competent and incompetent groups, $\beta = .03$, $t(118) = 0.29$, $p = .77$; $\beta = -.02$, $t(118) = -0.16$, $p = .87$.

HW/HC group. Additional analyses examined the associations between NFA, NFC, and attitudes toward each type of group in the design. To examine whether NFA and NFC predict responses to the HW/HC group (American people), the thermometer ratings and the social distance measure were regressed, in separate analyses, on NFA and NFC as simultaneously entered predictors. These analyses showed that there were no significant associations between NFA and the favorability and desired social closeness toward American people, $\beta = .10$, $t(118) = 0.95$, $p = .35$; $\beta = .12$, $t(118) =$

1.23, $p = .22$. Similarly, NFC exhibited no significant associations with the evaluation of and desired social closeness to American people, $\beta = .14$, $t(118) = 1.44$, $p = .15$; $\beta = .14$, $t(118) = 1.40$, $p = .16$.

HW/LC groups. The thermometer ratings and the social distance measure across HW/LC groups were regressed on NFA and NFC. Tables 5 and 6 show the results for all groups. The analyses revealed that participants higher in NFA evaluated the HW/LC groups more favorably, $\beta = .19$, $t(118) = 1.98$, $p = .050$, which was most evident for the elderly and people with mental retardation. However, participants higher in NFA did not desire more social closeness to HW/LC groups, $\beta = .15$, $t(118) = 1.50$, $p = .14$.

Participants higher in NFC tended to evaluate HW/LC groups more favorably and to prefer more social closeness, $\beta = .16$, $t(118) = 1.67$, $p = .098$; $\beta = .19$, $t(118) = 1.97$, $p = .051$. In particular, participants higher in NFC showed a more positive evaluation of people with physical disabilities on both measures. Moreover, participants who were higher in NFC preferred more social closeness to people with mental retardation and tended to evaluate them more favorably. All associations for children, the elderly, and housewives were non-significant.

LW/HC groups. Tables 5 and 6 show the results of the regression analyses that analyzed the thermometer ratings and social closeness measures for the LW/HC groups with NFA and NFC as predictors. Participants higher in NFC evaluated the LW/HC groups more favorably, $\beta = .26$, $t(118) = 2.78$, $p = .006$, and they preferred more social closeness to them, $\beta = .26$, $t(118) = 2.71$, $p = .008$. In particular, participants who scored higher in NFC showed more positivity on both measures toward Jewish people, German people, Asian people, Chinese people, Japanese people, and professionals. Moreover, they tended to show more positivity toward feminists on both measures.

NFC did not significantly predict favorability or social closeness toward British people and rich people.

Participants higher in NFA evaluated LW/HC groups more favorably, $\beta = .20$, $t(118) = 2.07$, $p = .040$, and tended to desire more social closeness, $\beta = .18$, $t(118) = 1.90$, $p = .060$. Specifically, participants higher in NFA evaluated Asian people, British people more favorably and trended in the same direction for rich people and Chinese people. Moreover, participants higher in NFA desired more social closeness toward British people and professionals, and tended to desire more social closeness toward Chinese people. All other associations were non-significant.

LW/LC groups. The analyses regressing favorability and social closeness ratings across LW/LC groups on NFA and NFC revealed a marginally significant association between NFA and favorability but not with desired social closeness toward these groups, $\beta = .17$, $t(118) = 1.78$, $p = .078$; $\beta = .14$, $t(118) = 1.38$, $p = .17$. In particular, as can be seen in Tables 5 and 6, the only significant association between NFA and the evaluation of LW/LC groups was that participants higher in NFA tended to evaluate homeless people more favorably. In contrast, participants who scored higher in NFC evaluated the LW/LC groups more favorably, $\beta = .23$, $t(118) = 2.37$, $p = .019$, and tended to desire more social closeness, $\beta = .19$, $t(118) = 1.92$, $p = .057$. That is, participants higher in NFC evaluated poor people more positively on both measures and they tended to evaluate homeless people more favorably.

Moderately perceived groups. The favorability ratings and desired social closeness ratings across moderately perceived groups were regressed on NFA and NFC. Participants higher in NFA tended to give higher favorability ratings, $\beta = .19$, $t(118) = 1.97$, $p = .051$, and to desire more social closeness toward these groups, $\beta = .19$, $t(118) = 1.95$, $p = .054$. Specifically, participants higher in NFA desired more social closeness to Black people, they tended to evaluate Black people more favorably, and they tended

to be more positive toward Hispanic people on both measures. All associations for gay men with NFA were non-significant.

Participants higher in NFC evaluated moderately perceived groups more favorably, $\beta = .24$, $t(118) = 2.49$, $p = .014$, and they desired more social closeness, $\beta = .26$, $t(118) = 2.69$, $p = .008$. In more detail, participants who scored higher in NFC were more positive on both measures toward Hispanic people and Black people, and they tended to prefer more social closeness to gay men (see Tables 5 and 6 for the full results).

Comparison between groups on thermometer measure. Participants' responses to which group they prefer and which group member would be the more enjoyable interaction partner were entered as dependent variables for every pair of groups in separate regression analyses with NFA and NFC as simultaneously entered predictors. Neither NFA nor NFC predicted preferences in any of these comparisons.

Discussion

Study 4 did not show the hypothesized pattern of associations between NFA and NFC and the evaluation of the different types of groups. That is, NFA did not predict the difference in evaluation between the stereotypically warm and cold groups and NFC did not predict the difference in evaluation between the stereotypically competent and incompetent groups. In particular, although NFA was associated with the evaluation of HW/LC groups, it was also associated with the evaluation of LW/HC groups. Moreover, NFC predicted a positive evaluation of LW/HC groups, but also of LW/LC groups and the moderately perceived groups. Moreover, it is noteworthy that all associations with NFA and NFC were positive.

It is conceivable that one reason for these unexpected findings may be socially desirable responding. The absence of negative associations with NFA and NFC stands in contrast to the (non-significant) findings in Study 3 and the findings by Aquino et al.

(2015) for individual targets. Moreover, NFC revealed positive associations with many groups that are often the targets of prejudice and for whom the expression of negative sentiments is socially unacceptable (e.g., Crandall, Eshleman, & O'Brien, 2002; Franco & Maass, 1999): Black people, Hispanic people, gay men, people with physical disabilities, people with mental retardation, poor people, and homeless people. In contrast, NFC showed no associations for stereotypically incompetent groups that are less often the targets of prejudice: the elderly, children, and housewives. As noted in the introduction, this finding is consistent with extant evidence that higher NFC predicts more socially desirable responding (for an overview, see Cacioppo et al., 1996) and greater avoidance of explicit prejudice (Waller, 1993). Overall, although people higher in NFC did show increased positive responses toward LW/HC groups, as expected, their potentially increased socially desirable responding for many groups that were classified as possessing low or moderate competence may have masked the expected pattern of associations with these groups.

Moreover, while NFA also showed no negative associations with the evaluation of the groups and positively predicted the evaluation of some socially sensitive groups (i.e., people with mental retardation, homeless people, Black people, Hispanic people), this pattern was not as clear as for NFC. Hence, although social desirability may also have affected the associations with NFA, the primary reason for the pattern of results for NFA may be different. For instance, it is conceivable that simply presenting names of groups does not evoke sufficient emotional reactions in participants. That is, the mere name of a real group might not be perceived vividly enough by participants higher in NFA, meaning that it is not experienced as an emotion-inducing stimulus. To be perceived with more emotional valence, the real groups may need to be contemplated more deeply and vividly.

Study 5

In Study 5, I attempted to address the limitations of Study 4 in several ways. As discussed above, the participants may have responded in a socially desirable manner for some of the groups that are well-known targets of prejudice. Moreover, I considered that including these frequent targets of prejudice may have affected participants' attitudes toward the entire assortment of groups because participants possibly became more conscious of the societal norm to be egalitarian. Consequently, I shrunk the design to focus on only two clusters of groups and presented less socially sensitive groups. Specifically, this study examined the associations between NFA and NFC and the evaluation of children, the elderly, housewives, Italian people, South American people, and Irish people (HW/LC groups) and of professionals, feminists, rich people, Asian people, Jewish people, and German people (LW/HC groups). I decided to focus on the ambivalent groups, because according to the SCM, most groups are perceived ambivalently (Cuddy et al., 2008). In addition, the pattern of associations with NFA and NFC would be most interesting for these ambivalent groups, because the two types of groups should show a directly opposing pattern. That is, people higher in NFA should prefer HW/LC groups to LW/HC groups, whereas people higher in NFC should prefer LW/HC groups to HW/LC groups. Finally, to make the groups more emotionally evocative and concrete, participants were asked to describe the groups before evaluating them. This descriptive task also made it possible to test directly whether the groups were indeed perceived in an ambivalent way.

Overall, then, Study 5 tested whether people higher in NFA evaluate real HW/LC groups more favorably than real LW/HC groups and whether people higher in NFC evaluate real LW/HC groups more favorably than real HW/LC groups. At the same time, this study tested whether the results are qualified by participants' age, gender, ethnicity, and the source of recruitment.

Method

Participants. In Study 5, two samples were selected (see the Procedure and Measures sections below for details). The first sample consisted of 120 American participants (68 men, 48 women, 4 did not report; 22 – 67 years of age, $M_{age} = 36.13$) who were recruited online via Amazon’s Mechanical Turk. All participants successfully completed the IMC (Oppenheimer et al., 2009) within the two attempts. One hundred participants were European American, six African American, six Hispanic American, five Asian American, one Middle Easterner, and two indicated ‘Other’ as their ethnicity. Participants received 1.60 US Dollars for their participation in a 15-minute survey. The second sample consisted of 135 American participants who were recruited online via Prolific Academic (prolificacademic.co.uk). Twelve participants failed the IMC (Oppenheimer et al., 2009) twice and were excluded from further participation. From the remaining 123 participants (61 men, 59 women, 3 did not report; 18 – 69 years of age, $M_{age} = 28.20$), 80 participants were European American, 19 were Asian American, seven were African American, five were Hispanic American, one was Middle Eastern, and 11 participants indicated ‘Other’. Participants received 1.90 US Dollars for their participation in a 15-minute survey. These two samples were selected from different online recruitment websites to achieve a higher generalizability of the results. Moreover, I refined the design in the second sample by applying small changes to the measures. However, as will be described below, the two samples did not differ from each other and were hence combined in the analyses.

Procedure. As in the previous study, all participants were first presented with the IMC. Subsequently, the participants in the first sample completed a series of items assessing stereotypes and attitudes for each of six groups, presented in an order that intermixed three HW/LC (children, the elderly, and housewives) and LW/HC groups (Asian people, Jewish people, and German people). The participants in the second

sample completed similar stereotypes and attitudes items for six different groups, again in an order that intermixed three HW/LC (Italian people, South American people, and Irish people) and LW/HC groups (professionals, feminists, and rich people). Finally, all participants completed the NFA and NFC questionnaires (internal reliabilities: $\alpha = .86$ and $\alpha = .94$, respectively) and were debriefed.

Measures. For the first sample, the stereotype and attitude measures were identical for each of the six target groups. Here, I describe their application to children as the target group. Participants were asked to indicate what a typical child is like. Specifically, they were presented with 37 attributes and they indicated for each attribute how characteristic it is of a typical child on a 5-point scale from *very uncharacteristic* to *very characteristic*. The 37 attributes were the same attributes as used in Study 3 with the addition of the warm attribute *popular*, which was also taken from Rosenberg et al.'s (1968) study. I included this attribute in Study 5 because of its high relatedness to the warmth dimension and because in Study 5 it was more important to achieve a comprehensive selection than to have an equal number of attributes. Thus, in total, the attributes were composed of 10 warm attributes, nine competent attributes, nine cold attributes, and nine incompetent attributes, all presented in random order. Subsequently, participants completed a thermometer measure of their attitude toward children. The same procedure was applied for the other five target groups.

For the second sample, I made a few minor changes to the stereotype content measure. First, the number of attributes presented was reduced from 37 to 24 items by selecting those six items for each of the four trait groups that showed the highest inter-correlations across groups in the first sample. Second, these 24 attributes were presented in the following single-random order: humorless, affectionate, determined, naïve, boring, skillful, incompetent, persistent, sociable, unfriendly, lazy, aimless, cold, helpful, happy, inefficient, warm, dismissive, wasteful, intelligent, unpopular,

competent, good-natured, and ambitious. Apart from these changes, the stereotype content task and the thermometer measure were the same as for the first sample of participants, and they were identical for each of the six target groups.⁵

Power analysis. After the unexpected results in Study 3 and 4, it was conceivable that the hypothesized associations with NFA and NFC are lower for groups than for individual targets. Hence, I adjusted the expected effect size to $\beta = .20$ for the stereotypically ambivalent real groups presented in this study. In regression analyses, with a recommended power of .80 and two predictors, the required sample size is 191 participants. Hence, the present sample size of 243 participants was sufficiently large. These calculations were obtained using *g*power* (Faul et al., 2007).

Results

Data preparation. Nine participants were excluded because they gave the same response on all thermometer ratings, thereby not providing sufficient variability. Moreover, two Italian participants, one Asian participant, one German participant, and one Irish participant were excluded because they had the same nationality as one of the target groups.^{6,7} Hence, 229 participants were retained for further analysis. Table 7 shows the descriptive statistics of the favorability ratings toward the groups.

As described below, the two samples did not differ from each other in terms of the associations between NFA and NFC and the favorability ratings toward the groups. Therefore, the two samples were combined. First, I computed an average of favorability ratings across HW/LC groups (sample 1: $\alpha = .60$; sample 2: $\alpha = .77$) and across LW/HC

⁵ After the attributes-rating task, both samples were presented with 24 attributes and asked to select and rank the five most important attributes to understand what a typical target (e.g., child) is like. These 24 attributes were a subset of the 37 attributes from the rating task. Aggregating across groups revealed low reliabilities (α 's = .07 - .71). Consequently, this measure is not discussed further.

⁶ The main conclusions were the same when these participants were retained.

⁷ Participants of Asian American and Hispanic American ethnicity were left in the analyses because they indicated their nationality in an open-ended question as 'American', instead of referring to their ethnic backgrounds. I considered participants' self-identified nationality of greater importance for knowledge and endorsement of stereotypes than their ethnicity.

groups (sample 1: $\alpha = .70$; sample 2: $\alpha = .13$).⁸ I then subtracted the average favorability ratings toward LW/HC groups from the average favorability ratings toward HW/LC groups so that higher difference scores reflect more favorability toward HW/LC groups than toward LW/HC groups.

For the responses on the stereotype content measure, I averaged across attributes for each trait and for each type of group. Next, the ratings on the coldness traits were subtracted from the ratings on the warmth traits and the ratings on the incompetence traits were subtracted from the ratings on the competence traits. This resulted in two dimension scores per type of group: HW/LC competence, HW/LC warmth, LW/HC competence, and LW/HC warmth (all α 's > .83). Hence, higher positive scores on these dimensions indicate that warmth or competence was seen as more characteristic of these groups and coldness or incompetence as less characteristic, whereas, conversely, higher negative dimension scores indicate that incompetence or coldness was seen as more characteristic of these groups and competence or warmth as less characteristic.⁹

Manipulation check. Repeated measures t-tests comparing the dimension scores between the two types of groups revealed that HW/LC groups were perceived as higher on the warmth dimension ($M = 1.57$, $SE = .06$) and lower on the competence dimension ($M = 0.74$, $SE = .06$) than LW/HC groups ($M = 0.22$, $SE = .06$; $M = 1.92$, $SE = .06$, respectively), $t(228) = 16.06$, $p < .001$, Cohen's $d = 1.06$, $t(228) = -17.76$, $p < .001$, Cohen's $d = -1.17$. Table 8 shows the stereotype ratings for every group on these

⁸ When the group feminists was excluded in sample 2, the alpha for the remaining LW/HC groups (i.e., professionals, rich people) increased to .56. Examining this restricted dataset showed that the associations between NFA and NFC and the evaluation of groups were stronger than in the full dataset. Hence, this provides support that the reported results are robust despite a low alpha for LW/HC groups in sample 2.

⁹ These perceived warmth and competence scores were computed across all available attributes. That is, in the first sample the warmth dimension score was based on 19 rated attributes and the competence dimension score was based on 18 rated attributes, whereas in the second sample the warmth and competence dimension scores were each based on 12 rated attributes. When excluding the additional attributes in the first sample, the main conclusions remained the same. The only difference was that children were not seen as more competent than incompetent, ($M=0.13$, $SE=0.12$), $t(108)=1.08$, $p=.28$, Cohen's $d=0.10$. In the main text, the stereotype content measure included the additional items for the first sample in order to be more comprehensive and to use all the available data.

dimensions and whether these ratings differ significantly from zero. As shown in the table, feminists and rich people were seen as more cold than warm and as more competent than incompetent. There was a tendency to perceive children as more incompetent than competent, whereas they were seen as more warm than cold. All the other groups were perceived positively on both dimensions. Hence, because negative impressions appear to be suppressed in most cases, these results may suggest that social desirability had an impact on the results.

Thermometer ratings. First, the difference in favorability toward HW/LC groups and LW/HC groups was regressed on NFA and NFC as simultaneously entered predictors. As expected, participants higher in NFA were more likely to evaluate HW/LC groups more positively than LW/HC groups, $\beta = .13$, $t(226) = 1.99$, $p = .048$, whereas participants higher in NFC were more likely to evaluate LW/HC groups more favorably than HW/LC groups, $\beta = -.20$, $t(226) = -3.00$, $p = .003$ (see Figure 2).

HW/LC groups. To look at the results in more detail, the thermometer rating across HW/LC groups was regressed on NFA and NFC. As expected, participants who scored higher in NFA showed more favorability toward these groups, $\beta = .22$, $t(226) = 3.43$, $p = .001$. When examining the individual HW/LC groups, this effect was most pronounced for housewives and the elderly (see Table 9). In contrast, NFC did not predict favorability toward HW/LC groups on aggregate, $\beta = .04$, $t(226) = 0.55$, $p = .58$.

LW/HC groups. In a regression analysis with the thermometer ratings across LW/HC groups and NFA and NFC as simultaneously entered predictors, participants higher in NFC showed more favorability toward these groups, $\beta = .24$, $t(226) = 3.63$, $p < .001$. In particular, the associations were most pronounced for Asian people and German people (see Table 9). On the other hand, NFA did not predict favorability ratings of LW/HC groups, $\beta = .08$, $t(226) = 1.24$, $p = .22$. Interestingly, however, participants higher in NFA evaluated rich people more negatively.

Ancillary analyses. I examined the moderating role of participants' age, gender, ethnicity (European American vs. other), and source of recruitment (mTurk vs. Prolific Academic) on the associations between NFA and NFC and the evaluation of the groups. The difference in favorability ratings between HW/LC groups and LW/HC groups was regressed onto NFA, NFC, the respective moderator, and its interaction terms with NFA and NFC. These analyses revealed no significant interactions. Given that the results were not moderated by source of recruitment, the two samples were combined in the analyses above.

One final ancillary analysis tested whether NFA and NFC predicted differences in attunement to warmth and competence information about the groups. That is, it was conceivable that NFA would relate to accentuating stereotype content along the warmth dimension such that people higher in NFA would perceive HW/LC groups and LW/HC groups as differing primarily on warmth. Conversely, NFC may relate to accentuating stereotype content along the competence dimension such that people higher in NFC would perceive these groups as differing primarily on competence.

To test this notion, the LW/HC warmth scores were subtracted from the HW/LC warmth scores and the HW/LC competence scores were subtracted from the LW/HC competence scores. Subsequently, this relative competence score was subtracted from the relative warmth score. Hence, higher positive scores on this relative stereotype content score indicate a stronger accentuation along the warmth dimension than along the competence dimension whereas higher negative scores indicate a stronger accentuation along the competence dimension than along the warmth dimension. In a regression analysis using this relative stereotype content score, and NFA and NFC as simultaneously entered predictors, the association between NFA and the relative stereotype content score was non-significant, $\beta = .05$, $t(226) = 0.78$, $p = .43$. In contrast,

participants higher in NFC showed a stronger accentuation along the competence dimension than along the warmth dimension, $\beta = -.18$, $t(226) = 2.64$, $p = .009$.

I explored whether relative stereotype content could function as a mediator between NFC and the difference in evaluation of HW/LC groups and LW/HC groups. The 95% confidence intervals for the attribute ratings [-3.35, -0.55] did not include zero, indicating a significant indirect effect. In particular, NFC was associated with accentuating the competence dimension more than the warmth dimension (a path; see analysis above), which in turn was associated with higher favorability toward LW/HC groups than toward HW/LC groups (b path), $\beta = .51$, $t(225) = 9.08$, $p < .001$. When the relative stereotype content score was included in the main analysis, the association between NFC and the difference in favorability became less strong (c' path), $\beta = -.11$, $t(225) = -1.98$, $p = .049$. Hence, this suggests that stereotype content may be a mediator in the association between NFC and attitudes. However, this ancillary analysis was only exploratory. The question of potential mediators will be addressed in more detail in Study 6, where I test three potential mechanisms underlying the associations between NFA and NFC and attitudes.

Discussion

Study 5 showed that people with a higher level of NFA gave a more favorable evaluation of real HW/LC groups than of real LW/HC groups. On the other hand, people with a higher level of NFC gave a more favorable evaluation of real LW/HC groups than of real HW/LC groups. These findings are in line with the expectations.

Moreover, the groups were perceived as expected on the warmth and the competence dimension, such that the HW/LC groups were perceived as warmer than LW/HC groups and LW/HC groups were perceived as more competent than HW/LC groups. However, the data again showed evidence of potential social desirability effects because almost all groups were perceived positively on both dimensions and negative

associations between NFA and NFC and the evaluation of groups also appeared to be largely suppressed. Nevertheless, despite this lack of negative associations, the present study showed the expected pattern of results for NFA and NFC and the evaluation of the groups.

Study 6

Study 6 aimed to replicate the findings of Study 5. That is, I examined the associations between NFA and NFC and the evaluations of housewives, the elderly, and South American people (HW/LC groups) and of Asian people, German people, and rich people (LW/HC groups). Moreover, I investigated three mechanisms underlying these associations. First, as discussed at the outset of this chapter, it was assumed that NFA predicts more positive evaluations of warmth, because warm attributes would imply more emotional stimulation than cold attributes. Similarly, NFC should predict more positive evaluations of competence, because competent attributes would imply more cognitive stimulation than incompetent attributes. In turn, these evaluations of warmth and competence should lead to more positive attitudes toward warm or competent groups. Hence, I assessed whether NFA predicts more positivity toward warm versus cold traits and whether this in turn explains the preference for HW/LC groups over LW/HC groups. Conversely, I tested whether NFC predicts more positivity toward competent versus incompetent traits and whether this in turn explains the preference for LW/HC groups over HW/LC groups.

The second potential mechanism pertained to differences in stereotype perception. It was conceivable that NFA and NFC predict differences in attunement to warmth and competence information about the groups such that NFA relates to accentuating stereotype content along the warmth dimensions, whereas NFC relates to accentuating stereotype content along the competence dimension. Support for the latter (NFC), but not the former (NFA), association was obtained in the prior study. To

examine this potential mechanism once again, I assessed whether NFA was associated with differentiating HW/LC groups and LW/HC groups more along the warmth dimension than along the competence dimension, which in turn could explain the higher favorability toward HW/LC groups versus LW/HC groups. Conversely, NFC may be associated with differentiating the groups more along the competence dimension than along the warmth dimension, which in turn could account for the higher favorability toward LW/HC groups versus HW/LC groups. Hence, I tested whether NFA and NFC are associated with a different perception of the groups' stereotype content, which could explain their attitude toward the groups.

Finally, I tested whether NFA and NFC predicted perceiving the HW/LC groups or the LW/HC groups as more similar to oneself. It was plausible that people higher in NFA perceive themselves as warmer, such that they perceive themselves as more similar to HW/LC groups than to LW/HC groups. Conversely, people higher in NFC may perceive themselves as more competent and hence may perceive more similarity between themselves and LW/HC groups than between themselves and HW/LC groups. This perceived similarity could in turn account for the differential evaluation of these types of groups that people higher in NFA and NFC display. Specifically, people higher in NFA could perceive themselves to be more similar to HW/LC groups, leading to higher favorability toward these groups, whereas people higher in NFC could perceive themselves as more similar to LW/HC groups, leading to higher favorability toward these groups.

Overall, then, this study tested the reliability of the associations obtained in the previous study, while testing three potential explanations of the associations between NFA and NFC and the attitudes toward the groups. These explanations entailed mediation by (1) the evaluation of attributes per se, (2) perceptions of stereotype content of the groups, or (3) perceived similarity of the groups to the self.

Method

Participants. For Study 6, I selected 138 American participants who were recruited online via Prolific Academic (prolificacademic.co.uk). Thirteen participants failed the IMC (Oppenheimer et al., 2009) twice and were excluded from further participation. From the remaining 125 participants (73 men, 52 women; 18 – 66 years of age, $M_{\text{age}} = 27.46$), 94 participants indicated their ethnicity as European American, 12 as Asian American, four as African American, three as Hispanic American, two as Middle Eastern, and 10 participants as ‘Other’. Participants received 1.96 US Dollars for their participation in a 15-minute survey.

Procedure. Study 6 presented six groups in an order that intermixed three HW/LC (housewives, the elderly, and South American people) and LW/HC groups (Asian people, German people, and rich people). After passing the IMC, participants evaluated warmth and competence attributes. Subsequently, participants indicated their attitude on thermometer measures toward the six groups, completed the NFA and NFC questionnaires (internal reliabilities: $\alpha = .84$ and $\alpha = .94$, respectively), and then filled in similar stereotype content measures as in Study 5 for the six groups. Finally, the participants indicated the extent to which they perceived themselves as similar to the six groups.

Measures. For the attribute evaluation task, I used the same 24 attributes as for the stereotype content measure in the second sample of Study 5 and presented these attributes in the same single-random order. Participants were asked to imagine that they were meeting different persons, each of whom possessed one of these attributes. Subsequently, they were asked to evaluate these attributes on a 7-point scale from *very negative* to *very positive*. Moreover, to assess participants’ perceived stereotype content, I used the same measure as in the second sample of Study 5. Finally,

participants indicated their perceived similarity toward the groups on a slider from 0 to 100.

Power analysis. Study 6 attempted to replicate the findings of Study 5 and presented groups from Study 4 and Study 5. For these groups, the median effect size of the relevant associations with NFA and NFC in the previous studies was $\beta = .23$, with values up to $\beta = .31$ for German people in Study 4. Hence, I adjusted the expected effect size to $\beta = .25$ for this study. In regression analyses, with a recommended power of .80 and two predictors, the required sample size is 120 participants. Thus, the present sample size of 125 participants was sufficiently large. These calculations were obtained using g*power (Faul et al., 2007).

Results

Data preparation. I employed the same exclusion criteria as in Study 5. Six participants were excluded because they gave the same response on all thermometer ratings, thereby not providing sufficient variability. Moreover, three Asian participants and one German participant were excluded because they had the same nationality as one of the target groups.^{10,11} Hence, 115 participants were retained for further analysis. Table 10 shows the descriptive statistics of the favorability ratings toward the groups.

First, I averaged the favorability ratings across HW/LC groups ($\alpha = .68$) and across LW/HC groups ($\alpha = .69$). Subsequently, the average favorability ratings toward LW/HC groups were subtracted from the average favorability ratings toward HW/LC groups as in Study 5. For the attribute ratings, I computed an average across warmth traits ($\alpha = .82$) and an average across competence traits ($\alpha = .83$). The responses on the stereotype content measures were processed in a similar way as in Study 5, resulting in two dimension scores per type of group: HW/LC competence, HW/LC warmth, LW/HC

¹⁰ The main conclusions were the same when these participants remained in the analyses.

¹¹ Participants of Asian American and Hispanic American ethnicity were left in the analyses because they indicated their nationality in an open-ended question as 'American', instead of referring to their ethnic backgrounds. I considered participants' self-identified nationality of greater importance for knowledge and endorsement of stereotypes than their ethnicity.

competence, and LW/HC warmth (all α 's > .88). Finally, the similarity ratings were averaged across HW/LC groups ($\alpha = .66$) and across LW/HC groups ($\alpha = .53$).

Manipulation check. Repeated measures t-tests comparing the dimension scores between the two types of groups revealed that HW/LC groups were perceived as higher on the warmth dimension ($M = 1.26, SE = .08$) and lower on the competence dimension ($M = 0.60, SE = .09$) than LW/HC groups ($M = -0.02, SE = .08; M = 1.85, SE = .10$, respectively), $t(112) = 14.10, p < .001$, Cohen's $d = 1.31$, $t(112) = -10.68, p < .001$, Cohen's $d = -1.00$. Table 11 shows the attribute-ratings for every group on these dimensions and whether these ratings differed significantly from zero. As shown in the table, rich people were perceived as more cold than warm and Asians were perceived as neutral on the warmth dimension. Apart from these findings, the groups were perceived positively on both dimensions. Hence, because negative impressions appear to be suppressed in most cases, these results may suggest that social desirability had an impact on the results.

Thermometer ratings. The difference in favorability toward HW/LC groups and LW/HC groups was regressed on NFA and NFC as simultaneously entered predictors. As expected, participants higher in NFA were more likely to evaluate HW/LC groups more positively than LW/HC groups, $\beta = .24, t(112) = 2.52, p = .013$, whereas participants higher in NFC tended to evaluate LW/HC groups more favorably than HW/LC groups, $\beta = -.17, t(112) = -1.79, p = .077$ (see Figure 3).

HW/LC groups. To look at the results in more detail, the thermometer rating across HW/LC groups was regressed on NFA and NFC. As expected, participants who scored higher in NFA showed more favorability toward these groups, $\beta = .22, t(112) = 2.26, p = .026$. When examining the individual HW/LC groups, this effect was most pronounced for the elderly and South American people (see Table 12). In contrast,

NFC did not predict favorability toward HW/LC groups on aggregate, $\beta = -.09$, $t(112) = -0.94$, $p = .35$.

LW/HC groups. In a regression analysis with the thermometer ratings across LW/HC groups and NFA and NFC as simultaneously entered predictors, NFC was not associated with favorability ratings toward these groups, $\beta = .05$, $t(112) = 0.47$, $p = .64$. However, participants higher in NFC evaluated German people more positively (see Table 12). NFA did not predict favorability ratings of LW/HC groups, $\beta = .04$, $t(112) = 0.36$, $p = .72$.

Attribute ratings. The attribute ratings across the warmth dimension were regressed on the simultaneously entered predictors NFA and NFC. Participants higher in NFA tended to evaluate warm traits more positively than cold traits, $\beta = .18$, $t(112) = 1.78$, $p = .078$. In contrast, NFC showed no significant associations with the evaluation of warmth attributes, $\beta = -.02$, $t(112) = -0.22$, $p = .83$. In a second regression analysis on the average competence ratings with the simultaneously entered predictors NFA and NFC, participants higher in NFC evaluated competent traits more positively than incompetent traits, $\beta = .25$, $t(112) = 2.57$, $p = .011$. In contrast, NFA showed no significant association with the evaluation of competence attributes, $\beta = -.05$, $t(112) = -0.56$, $p = .57$.

Mediation analyses. I tested the mediational roles of attribute ratings, stereotype content, and perceived similarity in the associations between NFA and NFC and attitudes. First, for the attribute ratings, participants' scores on the competence dimension were subtracted from their scores on the warmth dimension such that higher positive values reflect a more positive evaluation of warmth than of competence whereas higher negative values reflect a more positive evaluation of competence than of warmth. For the stereotype content ratings, as in Study 5, participants' warmth score for LW/HC groups was subtracted from their warmth score for HW/LC groups, and the

competence score for HW/LC groups was subtracted from the competence score for LW/HC groups. Subsequently, the relative competence score was subtracted from the relative warmth score. Hence, higher positive values on this relative stereotype content score indicate a stronger accentuation along the warmth dimension than along the competence dimension, whereas higher negative values indicate a stronger accentuation along the competence dimension than along the warmth dimension. Similarity ratings for LW/HC groups were subtracted from similarity ratings for HW/LC groups. The dependent variable was the difference in favorability ratings toward HW/LC groups and LW/HC groups. Thus, for the similarity ratings and for the favorability ratings, higher scores indicate higher ratings for HW/LC groups than for LW/HC groups. The mediational effects were tested using bootstrapping analyses with 5000 iterations (Preacher & Hayes, 2008).

The first analysis tested whether the association between NFA and relative favorability ratings was mediated by the simultaneously entered attribute ratings, stereotype content ratings, and similarity ratings, controlling for NFC (see Figure 4 for the mediational models and full results). This analysis revealed that participants higher in NFA evaluated the HW/LC groups more positively than the LW/HC groups (c path; see main analysis above). The 95% confidence intervals for the attribute ratings [0.01, 0.65] and for the stereotype content ratings [0.04, 1.14] did not include zero, indicating significant indirect effects. That is, NFA was associated with evaluating warmth more positively than competence (a path), which in turn predicted marginally higher favorability toward HW/LC groups than toward LW/HC groups (b path). The direct effect became marginally significant when individually controlling for attribute ratings (c' path). Moreover, NFA was associated with accentuating the stereotype content of groups more along the warmth dimension than along the competence dimension (a path), which in turn predicted more positive attitudes toward HW/LC groups than

toward LW/HC groups (b path). The direct effect became non-significant when individually controlling for stereotype content ratings (c' path). In contrast, the 95% confidence intervals for similarity ratings [-0.07, 1.21] included zero, indicating a non-significant indirect effect. Specifically, NFA was marginally associated with perceiving HW/LC groups as more similar to the self than LW/HC groups (a path), which in turn was associated with a more positive evaluation (b path). The direct effect became marginally significant when controlling for similarity ratings (c' path). Thus, the association between NFA and attitudes toward the groups was mediated by attribute ratings and stereotype content, but not by perceived similarity.

In a similar analysis, with NFC as the predictor and NFA as the covariate (see Figure 5 for the mediational models and full results), the total effect of NFC on relative favorability was marginally significant (c path; see main analysis above). The 95% confidence intervals for the attribute ratings [-1.93, -0.03], for the stereotype content ratings [-2.74, -0.09], and for the similarity ratings [-3.42, -0.15] showed significant indirect effects. In particular, NFC was associated with evaluating competence more positively than warmth, with accentuating the stereotype content of groups more along the competence dimension than along the warmth dimension, and with perceiving LW/HC groups as more similar to the self than HW/LC groups (a paths). In turn, attribute ratings, stereotype content ratings, and similarity ratings predicted higher favorability toward LW/HC groups than toward HW/LC groups (b paths). The direct effect became non-significant when individually controlling for attribute ratings, for stereotype competence ratings, and for similarity ratings (c' paths). Thus, the association between NFC and attitudes toward the groups was mediated by attribute ratings, stereotype content, and perceived similarity.

Discussion

Study 6 successfully replicated the findings of Study 5. Hence, overall, this research program provided consistent evidence that people with a higher level of NFA give a more favorable evaluation of real HW/LC groups than of real LW/HC groups. Conversely, people with a higher level of NFC give a more favorable evaluation of real LW/HC groups than of real HW/LC groups.

In addition, Study 6 provided evidence for the underlying mechanisms. All three mechanisms that were examined received at least partial support. First, the evaluation of attributes emerged as a consistent mediator in the associations between NFA and NFC and attitudes toward the groups. In particular, people higher in NFA evaluate warmth more positively than competence, which in turn is associated with higher favorability toward HW/LC groups than toward LW/HC groups. On the other hand, people higher in NFC evaluate competence more positively than warmth, which in turn is associated with more favorability toward LW/HC groups than toward HW/LC groups.

Second, in Study 6, the stereotype content of the groups mediated the associations between NFA and NFC and attitudes toward the groups. In combination with the findings of Study 5, which also explored this variable as a potential mediator, stereotype content emerged as a consistent mediator in the associations between NFC and attitudes. This indicates that people higher in NFC accentuate differences in stereotype content of the groups more along the competence dimension than along the warmth dimension, and this in turn is associated with a more positive evaluation of LW/HC groups than of HW/LC groups. In contrast, for NFA, stereotype content only functioned as a mediator in Study 6, but not in Study 5. Hence, there is only mixed evidence for stereotype content as a mediator of the association between NFA and attitudes toward the groups.

Third, the perceived similarity of the groups to the self played a role in the liking of the groups. That is, people higher in NFC see themselves more similar to LW/HC groups than to HW/LC groups, and this in turn is associated with a more positive attitude toward LW/HC groups than toward HW/LC groups. In contrast, perceived similarity did not play a role for the association between NFA and the evaluation of the groups.

Overall, the evidence suggests that for the relationship between NFA and people's attitudes toward the groups, only the evaluation of attributes emerges as a consistent mediator. On the other hand, for the relationship between NFC and people's attitudes toward the groups, all three tested mediators (i.e., the evaluation of attributes, stereotype content, and perceived similarity) consistently mediate the associations with the attitudes toward the groups.

Study 6 showed again that HW/LC groups were perceived as warmer and as less competent than LW/HC groups, consistent with previous research on the SCM. Interestingly, although the stereotype content measure again revealed a lack of negative perceptions of the groups, some of the associations between NFA and NFC and the attitudes toward the groups were negative, contrary to Study 5. It is noteworthy that these negative associations emerged mainly for non-racial groups (i.e., elderly, housewives, and rich people) and not for racial groups. This again suggests that the role of social desirability should be taken into account with regard to the present findings. Finally, contrary to the speculation in Study 4 that the mere name of a group may not be emotionally evocative enough for people higher in NFA, Study 6 revealed the expected associations even when the evaluation of groups was not preceded by a stereotype content measure (but by an attribute evaluation measure). It may be possible that these associations emerged because the attribute evaluation measure made the groups'

relevance to warmth more salient. Alternatively, the associations may have emerged in Study 6 because less socially sensitive groups were selected than in Study 4.

Chapter Discussion

Research Findings

The research presented in this chapter investigated the role of NFA and NFC in intergroup perception. In line with the expectations, Study 5 and Study 6 showed consistently that people with a higher level of NFA are more favorable toward real groups that are stereotyped as high in warmth and low in competence than toward real groups that are stereotyped as low in warmth and high in competence. Conversely, people with a higher level of NFC are more favorable toward real groups that are stereotyped as high in competence and low in warmth than toward real groups that are stereotyped as low in competence and high in warmth.

Study 3 and Study 4 illustrated some boundary conditions of the obtained findings. That is, Study 3 showed that for fictitious groups, people higher in NFA are more favorable toward warm group members than toward cold group members, whereas people higher in NFC are more favorable toward competent group members than toward incompetent group members. However, unexpectedly, this pattern of results was not obtained for the fictitious groups themselves. Given that groups are more abstract and less coherent than individuals (Hamilton & Sherman, 1996), people may perceive fictitious groups less concretely and vividly. As a result, fictitious groups may not be perceived as emotionally or cognitively stimulating. I dealt with this issue by presenting real groups in Study 5 and Study 6 because real groups may be based on rich underlying stereotypes and may hence be perceived emotionally or cognitively stimulating.

In addition, the findings of Study 4 suggested that social desirability may play an important role in the evaluation of various groups such that it may have masked or

weakened the expected pattern of associations with NFA and NFC. That is, social desirability has been linked to NFC (Cacioppo et al., 1996; Waller, 1993), and accordingly, especially NFC showed strong unexpected associations with socially sensitive groups. I dealt with this issue in Study 5 and Study 6 by selecting less socially sensitive groups. However, in addition, across Studies 4, 5, and 6, negative stereotype content and negative associations between NFA and NFC and attitudes toward the groups appeared to be suppressed, thereby still showing signs of socially desirable responding. Hence, future research could benefit from including a measure of the social sensitivity of each group or to utilize implicit measures of attitudes. In the present studies, I chose not to include a measure of social sensitivity or to measure attitudes implicitly because the focus of this second research program was on consciously endorsed intergroup attitudes and their potential practical relevance. As discussed earlier, people's consciously endorsed attitudes are important because they predict more deliberative behavior (Dovidio et al., 2002) which may be similarly detrimental to targets of prejudice as more spontaneous prejudice. Hence, instead of controlling for social desirability, the present studies assessed people's attitudes in the presence of social sensitivity pressures which may correspond more to everyday life situations and hence increase the practical relevance of the findings. Nevertheless, it would be fruitful to extend the present findings in future research and utilize implicit measures of attitudes toward the various groups and examine their associations with NFA and NFC.

Study 6 also provided evidence for the mechanism underlying these associations. That is, consistent with previous research by Aquino et al. (2015), people higher in NFA evaluated warmth more positively than competence, whereas people higher in NFC evaluated competence more positively than warmth. Importantly, Study 6 provided evidence that this differential evaluation of attributes mediates the associations between NFA and NFC and attitudes toward the groups. Specifically, people higher in NFA

evaluate warmth more positively than competence, which in turn relates to their preference for stereotypically warm and incompetent groups over stereotypically cold and competent groups. On the other hand, people higher in NFC evaluate competence more positively than warmth, which in turn relates to their preference for stereotypically competent and cold groups over stereotypically incompetent and warm groups. Additionally, the results indicated that stereotype content and the perceived similarity of the group to the self also play a consistent mediating role for people higher in NFC, but not for people higher in NFA. That is, people higher in NFC differentiate stereotypically ambivalent groups more along the competence dimension than along the warmth dimension, which in turn explains their preference for stereotypically cold and competent groups over stereotypically warm and incompetent groups. Moreover, people higher in NFC perceive themselves as more similar to stereotypically cold and competent groups than to stereotypically warm and incompetent groups, which in turn is associated with their preference for the former type of groups over the latter.

However, it is important to dissociate these mechanisms that entail a higher sensitivity to presented warmth and competence information from a mechanism that involves a spontaneous accentuation of warmth and competence in groups. That is, additional data suggests that people differing in NFA and NFC do not spontaneously perceive the warmth or the competence dimension in groups, respectively. In particular, in an additional study, 79 students from Cardiff University were asked to describe five different groups by providing attributes in a sentence-completion task. The five presented groups were British people and students (i.e., HW/HC groups), Dutch people and gay men (i.e., moderately perceived groups), and homeless people (i.e., LW/LC group). I selected exclusively univalent groups based on the notion that participants may be more likely to spontaneously accentuate the warmth or the competence dimension, depending on their level of NFA and NFC. For each group, participants

were asked to provide eight characteristics that they would use to describe the group. They were also asked to rate the positivity of each characteristic they provided. The results indicated that NFA and NFC did not predict the proportion of the provided warmth attributes to competence attributes, $\beta = -.06$, $t(76) = -0.50$, $p = .62$; $\beta = -.13$, $t(76) = -1.11$, $p = .27$, a combined measure of proportion and order of listed warmth attributes compared to competence attributes, $\beta = -.21$, $t(76) = -1.87$, $p = .066$; $\beta = -.08$, $t(76) = -0.69$, $p = .49$, or the positivity of the provided warmth and competence attributes, $\beta = -.08$, $t(76) = -0.73$, $p = .47$; $\beta = -.13$, $t(76) = -1.14$, $p = .26$. (For all three measures, a higher positive beta weight indicates a stronger accentuation of warmth compared to competence and a higher negative beta weight indicates a stronger accentuation of competence compared to warmth.) Overall, this may suggest that, although people differing in NFA and NFC are more sensitive toward presented warmth or competence information, they do not show an accentuation in their spontaneous perception of warmth or competence traits in different groups – what differs is the degree to which these traits are important to the people differing in NFA and NFC. However, it is noteworthy that the differences of the sample in this additional study to the samples in the present research program (e.g., differences in culture, socioeconomic status, and political orientation) may have had an impact on the results. This is discussed in more detail in the following section in the context of another additional study. Hence, future research could test the spontaneous perception of warmth and competence information more thoroughly.

Finally, it is worth noting that this set of studies considered the contributions of NFA and NFC to the evaluation of groups independently from each other, that is, the analyses did not include the interaction between NFA and NFC. This was the case because no clear predictions were made for the interaction term. In all of the studies described in this chapter, I also examined an alternative model including the interaction

term. This model consistently produced non-significant findings for the interaction between NFA and NFC, whereas the principal conclusions for the separate associations with NFA and NFC across all four studies remained the same and even became stronger in many cases. Hence, the obtained findings persist irrespective of whether the interaction is included in the analysis or not.

Attempt at Replication

An additional study was conducted that attempted to replicate Study 5 in a European context with target groups from the four SCM clusters. This study was not discussed in the main body of the text because it differed in several ways from the methodology of Study 5. As a result, differences in outcomes between this additional study and Study 5 could not be clearly attributed to a single factor (e.g., culture) and were hence difficult to explain. Nevertheless, this additional study is reported here for completeness and because it highlights a need for future research.

For this study, 94 students (84 women, 10 men; 17 – 47 years of age, $M_{age} = 19.22$; 80 White European descent, 7 Asian descent, 7 ‘Other’) were recruited at Cardiff University and participated in return for course credits. The participants were presented with HW/LC groups (i.e., housewives, Portuguese people), LW/HC groups (i.e., feminists, German people), HW/HC groups (students, middle-class people), and LW/LC groups (homeless people, welfare recipients). Except for these differences, the study followed the design of Study 5 such that participants completed similar stereotype content measures and thermometer measures. Although the groups were perceived as expected along the warmth and competence dimension, NFA did not predict the difference in evaluation of warm groups (i.e., HW/HC and HW/LC groups) and cold groups (i.e., LW/HC and LW/LC groups), $\beta = -.06$, $t(91) = -0.57$, $p = .57$. Conversely, NFC did not predict the difference in evaluation of competent groups (i.e., HW/HC and LW/HC groups) and incompetent groups (i.e., HW/LC and LW/LC groups), $\beta = -.02$,

$t(91) = -0.14, p = .89$. However, when the analysis was restricted to the ambivalent groups, participants higher in NFC tended to evaluate LW/HC groups more positively than HW/LC groups, $\beta = -.20, t(91) = -1.90, p = .060$. In contrast, NFA was not associated with the difference in evaluation of ambivalent groups, $\beta = -.02, t(91) = -0.23, p = .82$.

There may be several reasons for this lack of associations. One possible reason is that the findings of this research program do not generalize to other cultures, given that the associations were consistently obtained for US American participants but did not replicate with a British sample. Moreover, another reason may be that the participants in this additional study were exclusively students and hence the unexpected lack of associations may be attributed to such factors as socio-economic status (i.e., students may be of higher socio-economic status than a more random sample) or political orientation (i.e., students may be more liberal than a more random sample). It is also conceivable that compensating participants with course credits in this additional study, compared to the monetary compensation in the previous studies, may have an impact on the results. Nevertheless, this study highlights a need for future research that tests to what extent the present findings can be generalized (e.g., to other cultures and other socio-economic groups). Although the samples in the present research program were gender-balanced and reflected a wide age range, there may be other boundary conditions to consider.

Moreover, this additional study shows again that the expected associations may be more likely for the ambivalent groups than for groups that are high or low in both warmth and competence, given that NFC tended to predict attitudes for ambivalent groups but not across the four SCM clusters. It would be useful to learn more about individual differences in the evaluation of groups that are high or low in both warmth and competence. If, for example, research finds that individual differences are more

relevant to understanding attitudes toward ambivalently stereotyped groups than toward non-ambivalently stereotyped groups, this finding would provide an important caveat to the range of influence for NFA and NFC. Nevertheless, as discussed before, the reason for the lack of associations for univalent groups may be socially desirable responding such that evaluations of LW/LC groups are likely to be masked.

Conclusions

In sum, the studies in this series provide novel evidence that NFA and NFC predict attitudes in an intergroup context. Although the findings suggest that groups are inherently more abstract and less vivid than individual targets, the rich underlying stereotypes of real groups may compensate for this and trigger the expected associations with NFA and NFC. Notwithstanding the single failed replication noted above, the results showed that people higher in NFA are sensitive to warmth information about real groups and people higher in NFC are sensitive to competence information about real groups. This finding is further substantiated by the underlying mechanism. That is, this series of studies provided evidence that NFA entails a more positive evaluation of warmth than of competence, presumably because warmth signals emotional stimulation. On the other hand, NFC entails a more positive evaluation of competence than of warmth, presumably because competence signals cognitive stimulation. In addition, NFC involves a stronger accentuation of stereotype content along the competence dimension than along the warmth dimension. These differential evaluations and accentuations in turn lead to more positive attitudes toward groups, depending on the groups' stereotypical warmth and competence.

This research program helps to integrate past evidence on attitude-relevant individual differences with research on intergroup attitudes, extending past evidence of how individual differences in NFA and NFC relate to attitudes (Aquino et al., 2015; Haddock et al., 2008). While previous research linked NFA and NFC to outcomes such

as differing susceptibilities to persuasive messages and the favorability of interpersonal attitudes, the present set of studies expand this line of research to the domain of prejudice and intergroup perception, providing first evidence that NFA and NFC predict *which* groups people like. Thereby, this research program contributes to a better understanding of the effects of NFA and NFC and reveals a provocative link to intergroup attitudes. Furthermore, the present set of studies builds upon the SCM and its claim that the focus on prejudice as a univalent negative attitude has obscured the finding that attitudes toward groups are often ambivalent by showing that the evaluation of this ambivalence depends on individual differences. Depending on people's level of NFA and NFC, people may evaluate the warmth or the competence dimension more positively, resulting in a more positive attitude toward particular groups. Thus, the present research indicates that the common ambivalence in attitudes toward groups is at least somewhat reduced on an individual level. Finally, the present findings could also be of more practical use in interventions. For instance, by emphasizing the warm characteristics or the competent characteristics of a group for people higher in NFA or NFC, people's intergroup attitudes could be improved. Thus, after pre-screening people for their level of NFA and NFC, campaigns and interventions could be adjusted accordingly to reduce intergroup conflict, which may be especially easy to implement online.

Overall, Chapter 3 presented evidence that NFA and NFC are important individual difference variables in the context of groups that are perceived as warm or cold. That is, people higher in NFA show more positive attitudes toward stereotypically warm and incompetent groups, whereas people higher in NFC show more positive attitudes toward stereotypically cold and competent groups. Moreover, this second research program provided first evidence for the relevance of another aspect of warmth – emotional stimulation – in the improvement of intergroup attitudes.

Chapter 4

General Discussion

Aims

This dissertation presented two sets of studies that investigated two novel sources of warmth in improving intergroup attitudes. The central idea was that some types of targets are automatically associated with interpersonal warmth, and that this higher perceived warmth can improve attitudes toward them. One research program tested whether the warmth of a group can improve racial attitudes on implicit measures, while the other research program tested whether the warmth of groups can improve attitudes toward them on explicit measures. This second program investigated whether individual differences moderate the potential role of warmth.

Based on previous research, the first portion of the present dissertation focused on child targets, who are a stereotypically warm target group. Specifically, the first series of studies presented faces of racial out-group children, based on findings that children's facial features elicit perceptions of warmth (Alley, 1983; Berry & McArthur, 1985; Glocker et al., 2009; McArthur & Apatow, 1984; Oosterhof & Todorov, 2008). I tested whether racial prejudice would be reduced for child targets as compared to adult targets on an implicit measure. An implicit measure was chosen because it was deemed unlikely that an explicit measure would show sufficient variability, due to the potentially high social undesirability for disliking out-group children. In contrast, the second series of studies examined the evaluation of groups varying in stereotypical warmth and competence using explicit measures. Past research on the stereotype content model (SCM; Cuddy et al., 2008) had shown that explicit measures pick up differences in stereotypic warmth and competence between these groups (Fiske et al., 2002). Hence, I used explicit measures to test whether people higher in NFA show more positive attitudes toward stereotypically warm groups in the SCM. For completeness, I also included need for cognition (NFC) and tested its relevance to the

evaluation of stereotypically competent groups. This series of studies also provided more direct evidence for the role of warmth.

These research programs were designed in parallel. In both series of studies, I expected that perceiving a target as warmer rather than colder would be associated with more positive intergroup attitudes. In the first research program, warmth was assumed to improve intergroup attitudes because a warm target group could be seen as less harming and threatening and instead as more supportive and approachable (Fiske et al., 2007). This hypothesis is based on findings that perceived threat and interpersonal distance play an important role in prejudice (Dotsch & Wigboldus, 2008; Quillian, 1995; Velasco González et al., 2008; Zaraté et al., 2004), and hence decreasing perceived threat and distance may be vital to improve intergroup attitudes (Mikulincer & Shaver, 2001). The second series of studies extended this prediction to different target groups (other than children) and examined an individual difference in the role of warmth, by testing whether people higher in NFA evaluate warmth more positively, which in turn could relate to their reduced prejudice toward warm groups. This hypothesis was based on evidence that people higher in NFA value emotional stimulation (Bartsch et al., 2010; Maio & Esses, 2001), which individuals who are higher in interpersonal warmth can provide (Hill, 1991). Hence, the second research program examined a previously untested aspect of warmth – emotional stimulation - in the reduction of prejudice.

Research Findings

Racial Prejudice Against Infants

Chapter 2 presented research comparing spontaneous racial prejudice toward infants and adults. Three studies showed that prejudice persisted even for very young child targets. Hence, despite the substantial evidence that children are associated with warmth, and contrary to the notion that this higher perceived warmth would improve

racial attitudes due to lower perceived threat and distance to the out-group, the spontaneous racial bias persisted. This finding held true across different sets of verbal and pictorial stimuli. Moreover, the results indicated that racial bias stems from a robust in-group favoritism instead of from an out-group derogation effect.

Additional data presented in the Chapter Discussion in Chapter 2 suggested that racial prejudice toward both child and adult targets may not be elicited through cartoon stimuli differing in skin tone. In addition, although the findings of this research program were consistent across the Implicit Association Test (Greenwald et al., 1998) and the Single-Target Implicit Association Test (Bluemke & Friese, 2008; Dotsch & Wigboldus, 2008), racial prejudice toward both adult and child targets did not register on the Affect Misattribution Procedure (Payne et al., 2005). Notwithstanding these unexpected null-findings even for adult targets, the findings cumulatively challenge the notion that racial prejudice against children is lower than prejudice against adults. In each case where spontaneous racial in-group bias against adults was detected, it was equally evident even when a prototypically warm group, children, was considered.

This prevalence of a spontaneous race bias even when warm groups are considered could indicate that people pay chronically more attention to race than to other categories as a consequence of lifetime experiences with these categories (Smith & Zaraté, 1992). Together with the suggestion that more attention to one category tends to decrease attention to another (Turner et al., 1987), this may suggest that spontaneous evaluations of racial out-groups will be dominated by a race bias, irrespective of any signs that the out-group may be low in threat, high in trustworthiness, or generally high in warmth. The reason for this dominance of a racial bias on a spontaneous level may be that humans are predisposed to categorize social targets in terms of coalitional allegiances, for which race has been perceived as a primary indicator throughout our evolutionary past (Kurzman et al., 2001). Hence, for warmth to improve intergroup

attitudes on a spontaneous level, long-term interventions or conscious goals may need to be employed, as discussed further below.

The question remains to what extent these findings can be expected to generalize to other in-groups and out-groups. In Chapter 2, I selected the racial majority group in the United Kingdom as the in-group (White Europeans) and the most prominent racial minority group as the out-group (South Asians). Given that the results indicated that in-group favorability and not out-group derogation was responsible for the racial bias, it could be speculated that the findings may differ for negatively perceived out-groups (e.g., Black Americans or Russian immigrants who have been directly linked to higher perceived threat; Mikulincer & Shaver, 2001; Riek et al., 2010). However, although the selected out-group in Chapter 2 was only seen as neutral on an implicit measure, spontaneous racial attitudes did not become more positive when child targets were considered. Hence, it may be expected that such an improvement of racial attitudes would be even less likely for a more negative out-group. Instead, although the studies showed a substantial spontaneous preference for the in-group over the out-group, the extent of racial prejudice may be even higher for these more negative groups, and hence conceivably even for child targets. In contrast, selecting less negative groups may provide more opportunity for warmth to reduce spontaneous prejudice and would be theoretically and practically meaningful. For instance, future research could test whether spontaneous prejudice toward newly formed arbitrary groups is reduced for child targets as compared to adult targets. Moreover, as discussed in Chapter 2, it would be interesting to examine whether minority group members would show a different pattern, based on the finding that minority group members can spontaneously prefer the majority group. That is, future research could test whether minority group members would show a spontaneous preference for the majority group even when child targets are presented.

One limitation of this research program is that the presented targets were only assumed to be high in warmth, without a direct assessment. To address this issue, the next research program examined the role of warmth more directly, providing stronger evidence for the effectiveness of warmth in improving intergroup attitudes. Moreover, given that this research program casted doubt on the notion that warmth can improve intergroup attitudes on an implicit level, the studies in Chapter 3 employed explicit measures. Finally, another difference to Chapter 2 is that warmth is assumed to improve attitudes through higher perceived emotional stimulation instead of through lower perceived threat, as explained above.

Need for Affect and Need for Cognition

Chapter 3 featured four studies that investigated the role of need for affect (NFA), and for completeness, the role of need for cognition (NFC), in intergroup perception. Specifically, people higher in NFA have been shown to actively seek out and enjoy emotionally evocative stimuli and events (Appel & Richter, 2010; Bartsch et al., 2010; Maio & Esses, 2001), whereas people higher in NFC have been shown to actively seek out and enjoy cognitively challenging stimuli and situations (Cacioppo & Petty, 1982; Cacioppo et al., 1983). This empirical chapter examined how NFA and NFC predict the evaluation of groups in the stereotype content model (SCM; Cuddy et al., 2008). These groups vary along the dimensions warmth and competence. As explained further below, I expected that people higher in NFA would show more positive attitudes on an explicit measure toward warm groups than toward cold groups, and that people higher in NFC would show more positive attitudes toward competent groups than toward incompetent groups. Study 5 and Study 6 provided consistent evidence in line with these expectations. That is, individuals with a higher level of NFA showed more favorability toward real groups that are stereotypically high in warmth and low in competence than toward real groups that are stereotypically low in warmth

and high in competence. Conversely, individuals with a higher level of NFC were more favorable toward real groups that are stereotyped as high in competence and low in warmth than toward real groups that are stereotyped as high in warmth and low in competence. These studies also showed that the groups were perceived as assumed on the warmth and the competence dimension. It is important to note that this analysis provided support for the notion advanced in Chapter 2 that children are seen as warm and incompetent.

Moreover, Study 6 provided support for the expected mechanism behind these associations. That is, I expected that warmth, compared to coldness, would be perceived as more emotionally stimulating and hence more positively by people higher in NFA. Similarly, competence, compared to incompetence, would be perceived as more cognitively stimulating and hence more positively by people higher in NFC. In turn, these differential evaluations of warmth and competence should relate to attitudes toward the groups that are perceived as varying in warmth and competence. In line with these expectations, the results showed that people higher in NFA evaluated warmth-related attributes more positively than competence-related attributes, and this difference in evaluation in turn explained their higher preference for stereotypically warm and incompetent groups over stereotypically cold and competent groups. On the other hand, people higher in NFC evaluated competence-related attributes more positively than warmth-related attributes, and this in turn explained their higher preference for stereotypically cold and competent groups over stereotypically warm and incompetent groups.

Additionally, the results indicated that stereotype content and the perceived similarity of the group to the self also played a consistent mediating role for people higher in NFC, but not for people higher in NFA. That is, people higher in NFC differentiated stereotypically ambivalent groups more along the competence dimension

than along the warmth dimension, which in turn explained their preference for stereotypically cold and competent groups over stereotypically warm and incompetent groups. Moreover, people higher in NFC perceived themselves as more similar to stereotypically cold and competent groups than to stereotypically warm and incompetent groups, which in turn was associated with their preference for the former type of groups over the latter.

Furthermore, the findings from Study 3 suggested that this pattern of results for real groups does not extend to fictitious groups varying in warmth and competence. In particular, the findings revealed the expected pattern of associations with NFA and NFC only for individual targets belonging to these fictitious groups. I speculated that fictitious groups may not be concrete enough to be perceived as emotionally or cognitively stimulating. Study 4 addressed this issue by testing real groups that may be based on rich stereotypes. In addition, although Study 4 did not show the expected pattern of results for real groups varying in warmth and competence, the results strongly suggested that the pattern may have been masked by social desirability effects. That is, in accordance with evidence that linked NFC to social desirability (Cacioppo et al., 1996; Waller, 1993), NFC showed strong unexpected associations with many socially sensitive groups. I addressed this issue by selecting less socially sensitive groups in the following studies. The results of those studies were in line with the predictions, as described above.

Additional data presented in the Chapter Discussion of Chapter 3 showed that people differing in NFA and NFC did not spontaneously accentuate the warmth or competence dimension in their description of the groups. Hence, although people are sensitive to warmth or competence information when they are presented with it, they may not spontaneously perceive warmth or competence in groups. Moreover, another additional study showed that the findings of the present research program may not

generalize to a British student sample. That is, NFA and NFC did not predict the evaluation of groups varying on the warmth and competence dimensions. However, this unexpected result could not be attributed to a single factor because this additional study differed not only in cultural context (i.e., American vs. British) from the studies in this research program, but also in other factors. Hence, it is not clear what led to these unexpected findings, indicating a need for future research.

On balance, the studies in this second series provided novel provocative evidence that people higher in NFA and NFC show more positive attitudes toward some groups, depending on the groups' level of perceived warmth and competence. This evidence indicates that a hitherto untested aspect of warmth can be linked to more positive intergroup attitudes. In particular, the findings show that people higher in NFA evaluate warmth more positively, presumably because of its relevance to emotional stimulation, and this in turn leads to more positive attitudes toward stereotypically warm and incompetent groups. Hence, the findings provide direct evidence that warmth plays a crucial role in improving intergroup attitudes for people higher in NFA. Conversely, people higher in NFC evaluate competence more positively, potentially because of its relevance to cognitive stimulation, and this in turn leads to more positive attitudes toward stereotypically cold and competent groups.

This empirical chapter presented evidence that NFA is an important individual difference variable in the context of groups that are perceived as warm. People may express negativity toward many groups by stereotyping them as warm but also as incompetent. However, the present research indicates that this common ambivalence in attitudes toward groups is at least somewhat reduced among people higher in NFA, who are sensitive to warmth, and consequently evaluate the group more positively. Metaphorically speaking, higher NFA is associated with a tendency to evaluate people

more on perceptions of the strength of their heart than perceptions of the capacity of their brains.

Explaining the Role of Warmth

The research reported here suggests that warmth is one means to improve intergroup attitudes. In particular, the second research program showed that people higher in NFA express more positive attitudes toward stereotypically warm and incompetent groups than toward stereotypically cold and competent groups. This series of studies also revealed that the groups were perceived as assumed along the warmth and competence dimension, and that the evaluation of warmth mediated the association between NFA and attitudes toward the groups, providing direct evidence that warmth played a crucial role in improving intergroup attitudes. The findings in the second research program indicate that NFA and NFC are important individual difference variables in intergroup perception that should be considered alongside right-wing authoritarianism (RWA) and social dominance orientation (SDO). That is, whereas people high in RWA and SDO express higher levels of prejudice, people high in NFA and NFC show lower prejudice toward certain types of groups.

These results, in combination with the discussed findings that the warmth of significant others can improve explicitly measured attitudes toward out-group members (Mikulincer & Shaver, 2001; Wolf, Karremans, et al., 2015), support the notion that warmth can improve attitudes toward out-groups and out-group members, especially for people higher in NFA. This occurred consistently not only across different sources of warmth and different paradigms, but also across different measures of explicit prejudice, different out-groups, different recruitment methods, and different nations. Moreover, it is noteworthy that the proposed processes underlying these effects of warmth to improve intergroup attitudes are assumed to be different for the two sets of studies. That is, whereas the warmth of a significant other may improve racial attitudes

by decreasing the perceived threat and distance to the out-group (Dotsch & Wigboldus, 2008; Mikulincer & Shaver, 2001; Quillian, 1995; Velasco González et al., 2008; Zarate et al., 2004), Chapter 3 builds on the assumption that warm groups are evaluated more positively by people higher in NFA because they perceive warmth as more emotionally stimulating. Hence, this indicates that two different aspects of warmth may result in the improvement of intergroup attitudes, illustrating the potential for broad applicability of warmth.

However, unexpectedly, the first research program provided evidence across three studies that spontaneous racial prejudice was not reduced for child targets compared to adult targets. Importantly, the second research program supported the assumption that children are seen as warm targets. Together with the evidence discussed in the general introduction that the warmth of a significant other may not extend to some behavioral measures, these findings may indicate that the beneficial effect of warmth does not extend to more indirect measures of racial bias. This conclusion stands in contrast to evidence reviewed in the general introduction that indirectly supports the effectiveness of warmth in improving spontaneous racial attitudes. One reported study by Dasgupta and Greenwald (2001) seems to be most similar to the approach of Chapter 2. In particular, the authors found that presenting admired Black people and disliked White people resulted in a subsequent reduction of spontaneous racial prejudice. Hence, this may imply that, although Black people are spontaneously seen negatively, admired Black people form a positive sub-group, and this positivity can improve attitudes toward Black people. If this is the case, it could be expected similarly that out-group children form a positive sub-group of the negative out-group, resulting in more positive attitudes toward this sub-group. However, a study by Joy-Gaba and Nosek (2015) casted doubt on the robustness of Dasgupta and Greenwald's (2001) finding, showing that the effect across four studies was only weak.

Importantly, Joy-Gaba and Nosek also found that the effect necessitated other factors such as including disliked White people, suggesting that the effect may not be driven by an admired, and hence positive, sub-group of the racial out-group. This may indicate that the negativity associated with a racial out-group is too robust to be counteracted by presenting a positive, or interpersonally warm, sub-group. Instead, it may be the case that even positive exemplars of a negative out-group are spontaneously construed as members of the out-group and therefore evaluated negatively. This is consistent with the speculation above that humans are predisposed to pay more attention to a target's race and less attention to other characteristics of the target.

The findings in the present dissertation can be integrated with previous research relating warmth-related factors to intergroup attitudes. As discussed in Chapter 1, approach and avoidance have been linked to warmth and coldness because warmth may signal that a target is approachable (Fiske et al., 2007) and there is substantial evidence that approaching targets, compared to avoiding them, leads to reduced spontaneous prejudice (Kawakami et al., 2007; Phills, Kawakami, Tabi, Nadolny, & Inzlicht, 2011).¹² Similarly, other warmth-related factors such as cooperation (Gaertner et al., 1993; Sherif et al., 1961) and intergroup contact (Allport, 1954; Pettigrew & Tropp, 2006; Shook & Fazio, 2008; Turner & Crisp, 2010) can be related to warmth and have been shown to improve intergroup attitudes. However, some mechanisms may be less effective in reducing prejudice, such as presenting a warm sub-group of the out-group, as discussed in the previous paragraph. The present dissertation highlights the importance of integrating research that examines warmth and warmth-related factors in the context of intergroup attitudes. Ultimately, this may yield a clearer picture of the effectiveness of mechanisms relying on warmth to improve intergroup attitudes.

¹² It is noteworthy that although approach and avoidance are seen as important and fundamental tendencies (Elliot & Covington, 2001), the present dissertation focused on warmth because the emphasis of the research reported here was on the perception of targets and less on behavioral tendencies. However, warmth and approach-avoidance tendencies are regarded as closely related and complementary in this dissertation.

Limitations and Future Research

General Effects of Warmth

The first research program provided a first indication that warmth may not reduce *spontaneous* racial prejudice, insofar as children are perceived as being warm. However, future research should examine in more detail whether spontaneous racial attitudes are indeed more resistant to change through warmth. For instance, in light of the evidence discussed in Chapter 1, it is conceivable that warmth can improve spontaneous intergroup attitudes, but more so by employing long-term interventions (e.g., approach-avoidance training, Kawakami et al., 2007; intergroup contact, Shook & Fazio, 2008) or when participants form a conscious goal (e.g., social goal to individuate, Wheeler & Fiske, 2005; imagined intergroup contact; Turner & Crisp, 2010). In contrast, simply presenting participants with a warm sub-group, such as children, may not be effective in improving spontaneous intergroup attitudes.

It would be useful to test this speculation by examining whether spontaneous racial bias persists toward other groups that are perceived as warm, such as the elderly, housewives, or pre-school teachers. Pre-school teachers may be a particularly interesting target group because previous research has shown that this group is also perceived as warm on an implicit level (Carlsson & Björklund, 2010). Moreover, face perception provides the possibility to test whether spontaneous racial bias persists toward out-group members with warm facial characteristics. This idea is based on research using computer-generated faces that vary along a trustworthiness dimension, from untrustworthy faces to trustworthy faces (Oosterhof & Todorov, 2008). Presenting these faces varying in trustworthiness with either racial in-group or racial out-group

characteristics could provide a more detailed test of the circumstances under which warmth can improve intergroup attitudes on an implicit (and explicit) measure. At the same time, such studies would extend the additional study that used cartoon characters as stimuli in the Implicit Association Test (see Chapter Discussion in Chapter 2). That is, it could be tested more extensively which out-group facial characteristics elicit (spontaneous) racial prejudice and under which circumstances perceived trustworthiness can reduce such racial bias.

Moreover, future research should consider different implicit measures of prejudice. In particular, although this research program showed consistently that spontaneous racial prejudice is not reduced for child targets, prejudice was exclusively measured with one type of implicit measures, the (Single-Target) Implicit Association Test. This implicit measure assesses the relative ease of associating different categories and has been claimed to be driven by abstract representations (Froni & Semin, 2012). Hence, it may be contended that this research program did not find an influence of warmth on prejudice, because warmth is expected to reduce prejudice by decreasing threat and avoidance, which may be more affective in nature, whereas the Implicit Association Tests rely on cognitive representations. That is, the affective influence of warmth may not have registered on the cognitively driven Implicit Association Test. Although an additional study attempted to address this limitation by using the affect-based Affect Misattribution Procedure (Payne et al., 2005), this implicit measure surprisingly did not reveal spontaneous racial prejudice for either child or adult targets. Hence, future research may examine this possibility in more detail by employing affect-based implicit measures to test the effect of warmth on spontaneous prejudice.

In addition, future research could test more directly whether intergroup attitudes can indeed be improved through interventions that target warmth or through conscious goals to perceive a group as warmer. For instance, participants could be trained to

associate a group with warm aspects before assessing their spontaneous prejudice toward the group. Moreover, participants could be asked to think about, imagine, or remember warm aspects of a group while completing an implicit measure of prejudice. Such studies could provide more insight about the boundary conditions of when warmth does improve spontaneous intergroup attitudes and when it does not.

Effects of NFA

Alongside such tests of when warmth improves intergroup attitudes and when it does not, future studies could include NFA to examine whether it moderates the impact of warmth in a manner congruent with the present findings. To elaborate, the second research program showed that people higher in NFA express more positive attitudes toward warm groups. It would be interesting to test whether NFA is associated with more positivity when images of warm groups and warm group members are presented. For instance, participants could be presented with images of housewives or the elderly, or the images could show computer-generated faces varying on trustworthiness while manipulating in-group and out-group characteristics as described above (Oosterhof & Todorov, 2008). Moreover, if NFA is indeed relevant in the perception of faces, it may be the case that it is also associated with more rapid and automatic evaluations of out-groups. Hence, NFA may be associated with spontaneous attitudes toward groups and individuals, and it may therefore be associated with more positivity on an implicit level.

Testing these research questions could advance this line of research by showing the breadth of the theoretical and practical implications. That is, if NFA plays a role in the perception and evaluation of faces, this could give more insight into people's first impressions. Similarly, if NFA plays a role in spontaneous evaluations, it could be important for people's nonverbal behavior toward various groups and individuals. Moreover, such research could advance our understanding of the effects of NFA, indicating when it is of relevance in the evaluation of individuals and groups. Given

that the evidence presented in this dissertation indicates that the effects of warmth are stronger for people higher in NFA, future research may benefit from including NFA (and perhaps NFC) while examining different inductions of warmth and different measures of its impact on prejudice and discrimination.

Finally, it may be interesting for future research to link NFA and NFC to the dehumanization literature. In particular, Haslam (2006) distinguishes between two types of dehumanization: mechanistic dehumanization, which involves denying human nature to targets, and animalistic dehumanization, which involves denying human uniqueness to targets. Importantly, affective traits, emotionality, and warmth were linked to human nature, whereas rationality and higher cognition were linked to unique humanness (Haslam, Bain, Douge, Lee, & Bastian, 2005). Hence, for instance, it would be fruitful to test whether NFA and NFC predict to what extent people deny unique humanness and human nature to targets and how this translates into attitudes toward the targets. Testing these ideas would advance the field by integrating NFA and NFC with the dehumanization literature.

Different Measures of Behavior

More research is needed to conclude whether and when warmth can improve responses toward racial out-groups on a behavioral measure. In everyday life, it would be important to know which types of behavior toward out-groups are likely to improve as a result of higher perceived warmth and which types of behavior are likely to show signs of a racial bias despite efforts to increase perceived warmth. This issue is relevant to the inconsistent behavioral effects of warmth in transference effects discussed in Chapter 1 (Kraus et al., 2010; Wolf, Karremans, et al., 2015). Recall that transference means that the positivity (warmth) of a significant other is transferred onto a target person when that target person resembles the significant other. Wolf, Karremans, and colleagues (2015) found that participants did not allocate more resources to the racial

out-group targets when they resembled participants' significant other than when they did not resemble their significant other. In contrast, Kraus et al. (2010) showed that participants sat closer to racial out-group targets when the targets resembled their significant other than when they did not resemble their significant other. I speculated in Chapter 1 that the nature of the measure may have been responsible for this inconsistency. That is, Wolf, Karremans, et al's (2015) measure of behavior required self-sacrifice to benefit the out-group target, whereas Kraus et al.'s (2010) behavioral measure involved interpersonal distance. Hence, the inconsistency between these findings may indicate that transference can lead to more positive intergroup behavior, but when self-sacrifice is required, perceptions of economic threat may increase and consequently reinstate intergroup boundaries. Future research could test the role of the type of behavioral measures more thoroughly, both in the transference effect onto racial out-group targets in particular and in attenuating racial discrimination in general.

Mechanisms

The research programs presented in this dissertation tested different assumptions about the mechanism in effects of warmth, but these tests were not comprehensive and not included in the first program of studies. That is, the first series of studies assumed that people would perceive out-group children as less threatening and as more supportive and approachable, due to the association between children and warmth. Because the prediction was not supported, a test of the assumed mechanism was not carried out.

In contrast, the second series of studies found that people higher in NFA evaluate warmth more positively than competence and that this difference mediates the relations between NFA and evaluations of groups. However, this research did not test the assumption that people higher in NFA evaluate warmth more positively because warmth signals emotional stimulation. Further studies could test whether the perception

of emotional stimulation mediates the associations between NFA and the evaluation of groups, alongside the mediator of evaluated warmth and competence, as demonstrated in this research program.

Conclusions

Together, the research reported here suggests that target warmth may be one important factor for improving intergroup attitudes. The evidence presented in this dissertation is promising and highlights the importance of integrating research examining warmth and warmth-related factors with research examining intergroup attitudes. The reported studies may help to direct future research to arrive at a more coherent view of when warmth and warmth-related factors are effective in helping to improve intergroup attitudes and when they are not. In addition, warmth-related factors could have broad practical implications for interventions to improve intergroup attitudes. That is, applied to everyday situations, describing a group in warm terms could alleviate prejudice on an explicit level, especially for people higher in need for affect. This strategy may be particularly beneficial for anti-racism campaigns. Similarly, accentuating the warmth of out-group individuals, for instance in a job application or in a description of a prospective co-worker, could make a positive first impression. Moreover, it is conceivable that a favorable first impression paves the way for a positive long-term interracial relationship, thereby also facilitating positive intergroup behavior and, eventually, spontaneous reactions toward out-group individuals. Such implications are among many reasons to further examine the role of warmth in the improvement of intergroup attitudes.

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Appendix
Stimulus words used in Study 3.

Warm Attributes	Rosenberg et al. (1968)	helpful	sentimental	humorous	happy	sociable	good-natured	warm
	Abele & Bruckmüller (2011)	empathetic	affectionate					
Cold Attributes	Rosenberg et al. (1968)	vain	finicky	unpopular	boring	humorless	cold	
	Abele & Bruckmüller (2011)	unfriendly	dismissive	reserved				
Competent Attributes	Rosenberg et al. (1968)	scientific	determined	persistent	skillful	industrious	intelligent	
	Abele & Bruckmüller (2011)	independent	ambitious	competent				
Incompetent Attributes	Rosenberg et al. (1968)	wasteful	naïve	submissive	impulsive			
	Abele & Bruckmüller (2011)	lazy	insecure	inefficient	aimless	incompetent		

Table 1

Mechanisms for explicit measures	Relations to warmth	
Robbers Cave experiment	Based on cooperation and forming a common group	Sherif et al., 1961; Gaertner et al., 2000
Common In-group Identity model	Based on cooperation and forming a common group	Gaertner & Dovidio, 2005; Gaertner, Dovidio, Anastasio, Bachman, & Rust, 1993
Intergroup contact	Based on intergroup contact, common goals, cooperation, decreased anxiety about intergroup contact, increased empathy and perspective taking; stronger effects for more intimate relationships, which may be based on increased trust; increased empathy may related to lower perceived threat	Allport, 1954; Pettigrew & Tropp, 2006, 2008; Paolini, Hewstone, & Cairns, 2007; Turner, Hewstone, Voci, Paolini, & Christ, 2007; Stephan & Finlay, 1999
Individuation	May lead to lower perceived threat	Wilder, 1978
RWA, SDO	Related to feeling warmth when thinking about the out-group	Altemeyer, 1981; Ekehammer, 2004
Mechanisms for implicit measures		
Categorization of coalitional allegiances		
Social goals modify amygdala activation	Social goal to individuate may lead to lower perceived threat	Kurzban, Tooby, & Cosmides, 2001
		Wheeler & Fiske, 2005
Saliency of multiple categories		Mitchell, Nosek, & Banaji, 2003
Accessibility of liked and disliked exemplars	Admiration may be related to warmth	Dasgupta & Greenwald, 2001; Cuddy, Fiske, & Glick, 2007
Evaluative conditioning		Olson & Fazio, 2006; Lai et al., 2014
Approach-avoidance training	Approach and avoidance may relate to warmth and coldness; participants sat closer and faced an out-group target more	Kawakami, Phills, Steele, & Dovidio, 2007; Fiske, Cuddy, & Glick, 2007
Long-term intergroup contact	Based on cooperation, common goals, forming friendships, intimacy, reduced intergroup anxiety	Shook & Fazio, 2008
Imagined intergroup contact	May be based on cooperation, common goals, reduced perceived threat, intimacy; target was evaluated as warmer after imagined contact	Turner & Crisp, 2010
Cooperating in a team	May be based on cooperation and forming a common group	Lai et al., 2014

Note. Mechanisms to reduce explicitly and implicitly measured prejudice and their relevance to warmth.

Table 2

Descriptive statistics for attitudes toward the groups and group members in Study 3.

Groups	<i>M</i>	<i>SD</i>
HW/HC	82.55	11.16
HW/LC	66.15	12.36
LW/HC	47.80	16.85
LW/LC	20.60	11.69
Group Members	<i>M</i>	<i>SD</i>
HW/HC	5.39	0.84
HW/LC	4.70	0.75
LW/HC	3.78	0.88
LW/LC	2.63	0.97

Note. Possible scores for the favorability ratings toward groups range from 0 to 100. Possible scores for the favorability ratings toward group members range from 1 to 7.

Table 3

Beta values and p values for the associations between NFA and NFC as simultaneous predictors of favorability toward the groups and group members in Study 3.

Groups	NFA		NFC	
	β	<i>p</i>	β	<i>p</i>
HW/HC	.03	.81	.17	.11
HW/LC	-.01	.94	-.08	.42
LW/HC	-.14	.17	-.06	.53
LW/LC	-.06	.58	-.02	.84
Group Members	β	<i>p</i>	β	<i>p</i>
HW/HC	.18	.079	.14	.16
HW/LC	.04	.72	-.28	.007
LW/HC	-.14	.16	-.15	.14
LW/LC	-.10	.32	-.14	.18

Note. Positive beta-values indicate that participants high in NFA or NFC rated the group and the group members more favorably.

Table 4

Descriptive statistics of the favorability ratings and desired social closeness toward the groups in Study 4.

Group type	Groups	Favorability		Social Closeness	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
HW/HC	American people	77.02	20.80	5.93	1.15
	The elderly	69.50	20.14	5.07	1.30
HW/LC	Children	73.30	23.67	-	-
	Housewives	73.83	19.33	5.56	1.18
	People with mental retardation	62.08	21.54	4.27	1.48
	People with physical disabilities	69.79	20.38	5.11	1.29
	Jewish people	69.83	20.64	5.38	1.22
LW/HC	German people	70.29	18.94	5.28	1.22
	Chinese people	68.33	18.50	5.27	1.13
	Asian people	72.33	16.61	5.49	1.08
	Japanese people	73.35	18.32	5.65	1.09
	professionals	77.52	17.73	5.78	1.15
	Feminists	51.15	28.41	4.00	1.87
	British people	74.31	17.79	5.59	1.09
LW/LC	Rich people	57.54	22.65	4.91	1.46
	Homeless people	49.93	26.45	3.54	1.73
MW/MC	Poor people	61.12	22.10	4.75	1.45
	Black people	65.88	24.45	5.14	1.51
	Hispanic people	67.37	20.67	5.08	1.34
	Gay men	63.88	24.18	5.04	1.47

Note. Possible scores for the favorability ratings toward groups range from 0 to 100. Possible scores for the social closeness ratings toward group members range from 1 to 7.

Table 5

Beta values and p values for the associations between NFA and NFC as simultaneous predictors of favorability toward the groups in Study 4.

Group type	Groups	NFA		NFC	
		β	p	β	p
HW/HC	American people	.10	.35	.14	.15
	The elderly	.22	.028	.08	.40
HW/LC	Children	.10	.33	.13	.21
	Housewives	.16	.11	.03	.79
	People with mental retardation	.17	.093	.16	.10
	People with physical disabilities	.13	.19	.24	.015
	Jewish people	.10	.29	.32	.001
LW/HC	German people	.14	.15	.28	.004
	Chinese people	.16	.087	.26	.007
	Asian people	.20	.035	.25	.009
	Japanese people	.14	.15	.19	.052
	Professionals	.15	.12	.20	.039
	Feminists	.02	.82	.17	.095
	British people	.24	.016	.04	.66
	Rich people	.19	.054	.04	.71
LW/LC	Homeless people	.20	.048	.17	.087
	Poor people	.13	.19	.28	.004
MW/MC	Black people	.19	.056	.22	.026
	Hispanic people	.18	.064	.23	.019
	Gay men	.11	.27	.16	.12

Note. Positive beta-values indicate that participants high in NFA or NFC rated the group more favorably.

Table 6

Beta values and p values for the associations between NFA and NFC as simultaneous predictors of preferred social closeness toward the groups in Study 4.

Group type	Groups	NFA		NFC	
		β	p	β	p
HW/HC	American people	.12	.22	.14	.16
	The elderly	.16	.11	.13	.21
	Children	-	-	-	-
HW/LC	Housewives	.15	.14	-.02	.83
	People with mental retardation	.10	.29	.22	.029
	People with physical disabilities	.08	.38	.30	.002
LW/HC	Jewish people	.12	.23	.30	.002
	German people	.13	.19	.31	.002
	Chinese people	.17	.087	.24	.012
	Asian people	.15	.14	.22	.025
	Japanese people	.14	.15	.22	.022
	Professionals	.20	.037	.19	.053
	Feminists	.06	.53	.17	.092
	British people	.25	.012	.01	.93
LW/LC	Rich people	.06	.57	.08	.46
	Homeless people	.14	.18	.15	.13
MW/MC	Poor people	.11	.25	.20	.043
	Black people	.24	.014	.21	.025
	Hispanic people	.16	.089	.25	.011
	Gay men	.07	.51	.19	.060

Note. Positive beta-values indicate that participants high in NFA or NFC desired more social closeness to the group.

Table 7

Descriptive statistics for attitude toward the groups in Study 5.

HW/LC groups	<i>M</i>	<i>SD</i>
Children	76.18	24.91
Elderly	78.50	19.03
Housewives	79.86	21.41
Italian people	71.89	16.32
South American people	66.78	17.44
Irish people	71.26	17.81
LW/HC groups	<i>M</i>	<i>SD</i>
Asian people	73.53	17.69
Jewish people	72.05	21.80
German people	72.65	20.61
Professionals	72.28	16.43
Feminists	47.95	26.44
Rich people	49.80	21.02

Note. Possible scores for the favorability ratings toward groups range from 0 to 100.

Table 8

Trait ratings in Study 5 averaged for every dimension and for every group.

HW/LC groups		<i>M</i>	<i>SE</i>	<i>p</i>	<i>Cohen's d</i>
Children	Competence	-0.22	.11	.040	0.20
	Warmth	1.41	.08	<.001	1.61
Elderly	Competence	0.79	.11	<.001	0.70
	Warmth	1.13	.10	<.001	1.13
Housewives	Competence	1.09	.12	<.001	0.84
	Warmth	1.69	.10	<.001	1.63
Italian people	Competence	0.95	.11	<.001	0.82
	Warmth	1.86	.10	<.001	1.63
South American people	Competence	1.00	.11	<.001	0.83
	Warmth	1.63	.12	<.001	1.28
Irish people	Competence	0.78	.10	<.001	0.69
	Warmth	1.63	.11	<.001	1.32
LW/HC groups		<i>M</i>	<i>SE</i>	<i>p</i>	<i>Cohen's d</i>
Asian people	Competence	2.07	.10	<.001	2.02
	Warmth	0.46	.11	<.001	0.39
German people	Competence	1.95	.12	<.001	1.62
	Warmth	0.48	.13	<.001	0.35
Jewish people	Competence	1.87	.11	<.001	1.63
	Warmth	0.82	.12	<.001	0.66
Professionals	Competence	2.70	.10	<.001	2.46
	Warmth	0.78	.11	<.001	0.66
Feminists	Competence	1.43	.10	<.001	1.25
	Warmth	-0.78	.14	<.001	-0.52
Rich people	Competence	1.49	.12	<.001	1.09
	Warmth	-0.32	.09	.001	-0.31

Note. These dimension scores were computed by subtracting incompetence ratings from competence ratings and coldness ratings from warmth ratings. Hence, higher positive scores indicate that the groups are perceived as higher on competence and lower on incompetence or higher on warmth and lower on coldness, whereas higher negative scores indicate that the groups are perceived as higher on incompetence and lower on competence or higher on coldness and lower on warmth (possible scores range from -5 to +5).

Table 9

Associations between NFA and NFC and favorability ratings in Study 5 for every group.

	<i>NFA</i>		<i>NFC</i>	
	β	<i>p</i>	β	<i>p</i>
HW/LC groups				
Children	.14	.16	.01	.92
Elderly	.23	.018	.03	.76
Housewives	.24	.014	-.06	.50
Italian people	.13	.16	.01	.89
South American people	.16	.080	.06	.56
Irish people	.11	.26	-.02	.81
LW/HC groups				
Asian people	.12	.22	.23	.015
German people	.11	.25	.23	.017
Jewish people	.06	.55	.13	.19
Professionals	-.03	.74	.10	.29
Feminists	.16	.098	.02	.82
Rich people	-.19	.039	.13	.15

Note. These associations were obtained by regressing the favorability ratings of the groups on the simultaneously entered predictors NFA and NFC.

Table 10

Descriptive statistics for attitude toward the groups in Study 6.

HW/LC groups	<i>M</i>	<i>SD</i>
Elderly	65.73	21.01
Housewives	62.33	21.00
South Americans	64.77	18.92
LW/HC groups	<i>M</i>	<i>SD</i>
German people	68.88	15.86
Rich people	46.97	19.86
Asian people	69.92	18.31

Note. Possible scores for the favorability ratings toward groups range from 0 to 100.

Table 11

Trait ratings in Study 6 averaged for every dimension and for every group.

HW/LC groups		<i>M</i>	<i>SE</i>	<i>p</i>	<i>Cohen's d</i>
Elderly	Competence	0.31	.11	.007	0.26
	Warmth	0.83	.10	<.001	0.75
Housewives	Competence	0.67	.13	<.001	0.48
	Warmth	1.34	.10	<.001	1.24
South American people	Competence	0.83	.12	<.001	0.64
	Warmth	1.63	.12	<.001	1.24
LW/HC groups		<i>M</i>	<i>SE</i>	<i>p</i>	<i>Cohen's d</i>
Asian people	Competence	2.15	.11	<.001	1.86
	Warmth	0.17	.12	.18	0.13
German people	Competence	1.96	.11	<.001	1.60
	Warmth	0.25	.10	.017	0.23
Rich people	Competence	1.43	.13	<.001	1.04
	Warmth	-0.47	.11	.001	-0.40

Note. These dimension scores were computed by subtracting incompetence ratings from competence ratings and coldness ratings from warmth ratings. Hence, higher positive scores indicate that the groups are perceived as higher on competence and lower on incompetence or higher on warmth and lower on coldness, whereas higher negative scores indicate that the groups are perceived as higher on incompetence and lower on competence or higher on coldness and lower on warmth (possible scores range from -5 to +5).

Table 12

Associations between NFA and NFC and favorability ratings in Study 6 for every group.

	<i>NFA</i>		<i>NFC</i>	
	β	<i>p</i>	β	<i>p</i>
HW/LC groups				
Elderly	.24	.014	-.14	.16
Housewives	.06	.57	-.15	.12
South American	.22	.023	.10	.32
LW/HC groups				
Asian people	.12	.24	-.01	.96
German people	.04	.68	.19	.051
Rich people	-.06	.53	-.05	.63

Note. These associations were obtained by regressing the favorability ratings of the groups on the simultaneously entered predictors NFA and NFC.

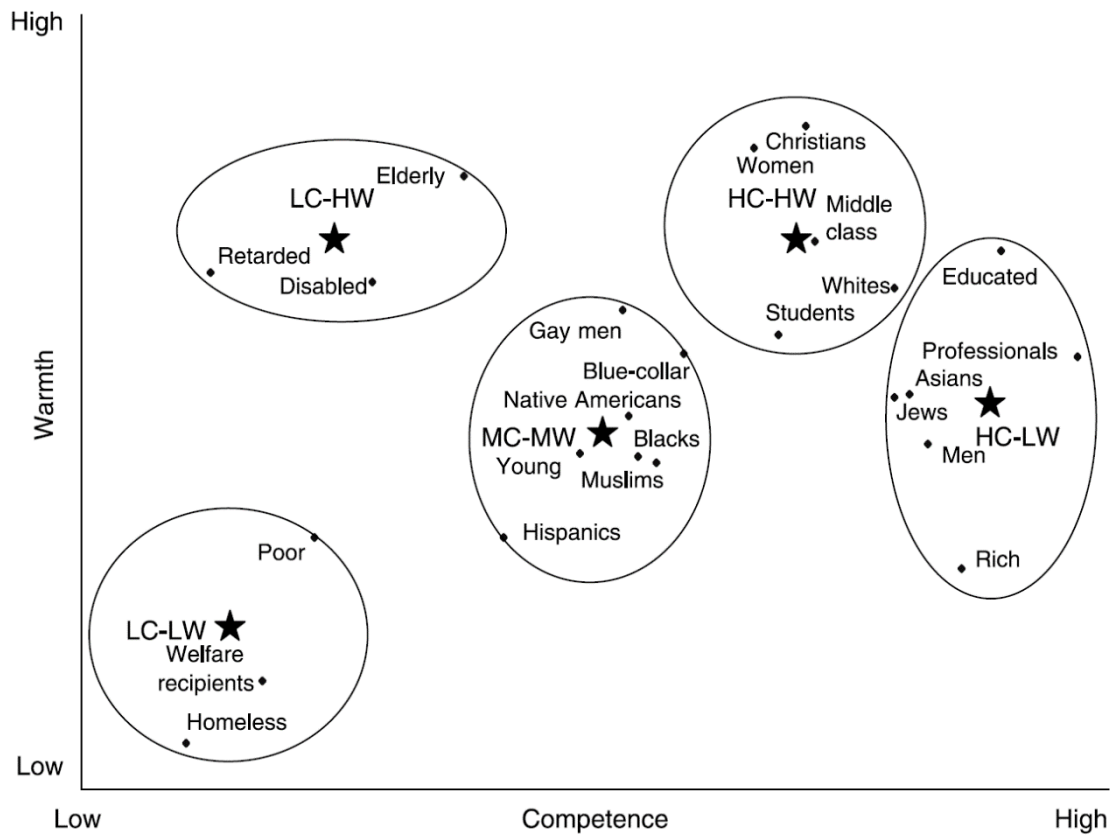


Figure 1. Organization of groups into five clusters along the warmth and competence dimensions (Fiske et al., 2002).

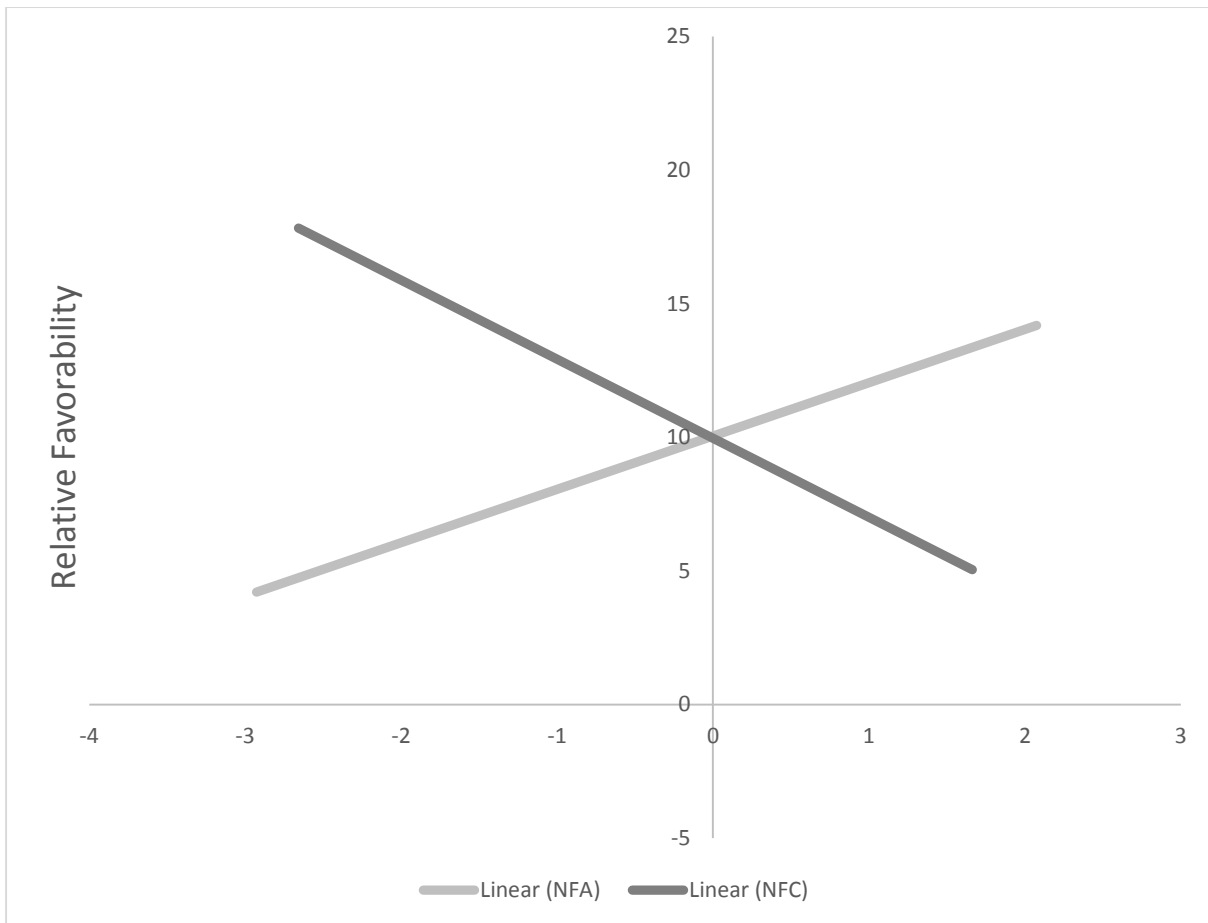


Figure 2. Relative favorability between HW/LC groups and LW/HC groups on standardized NFA and NFC scores in Study 5. Higher scores on relative favorability reflect more positivity toward HW/LC groups than toward LW/HC groups. Possible values on relative favorability range from -100 to +100.

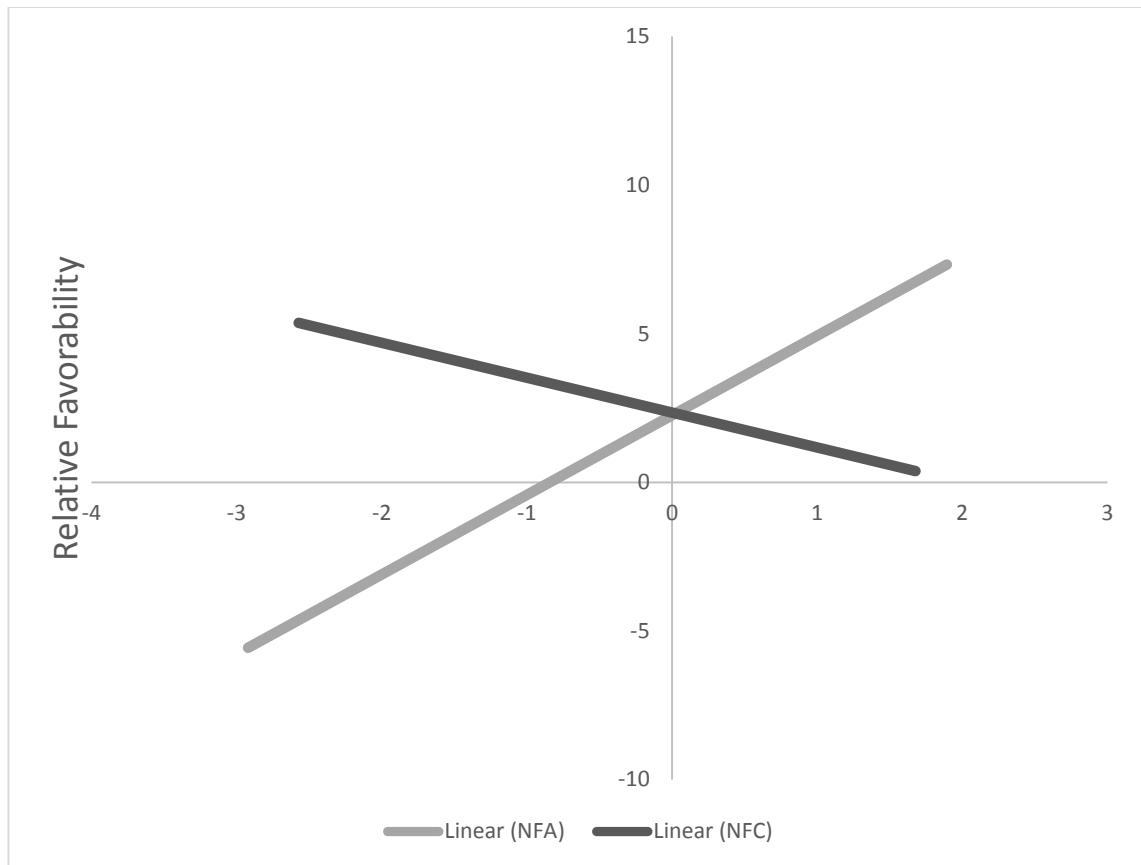


Figure 3. Relative favorability between HW/LC groups and LW/HC groups on standardized NFA and NFC scores in Study 6. Higher scores on relative favorability reflect more positivity toward HW/LC groups than toward LW/HC groups. Possible values on relative favorability range from -100 to +100.

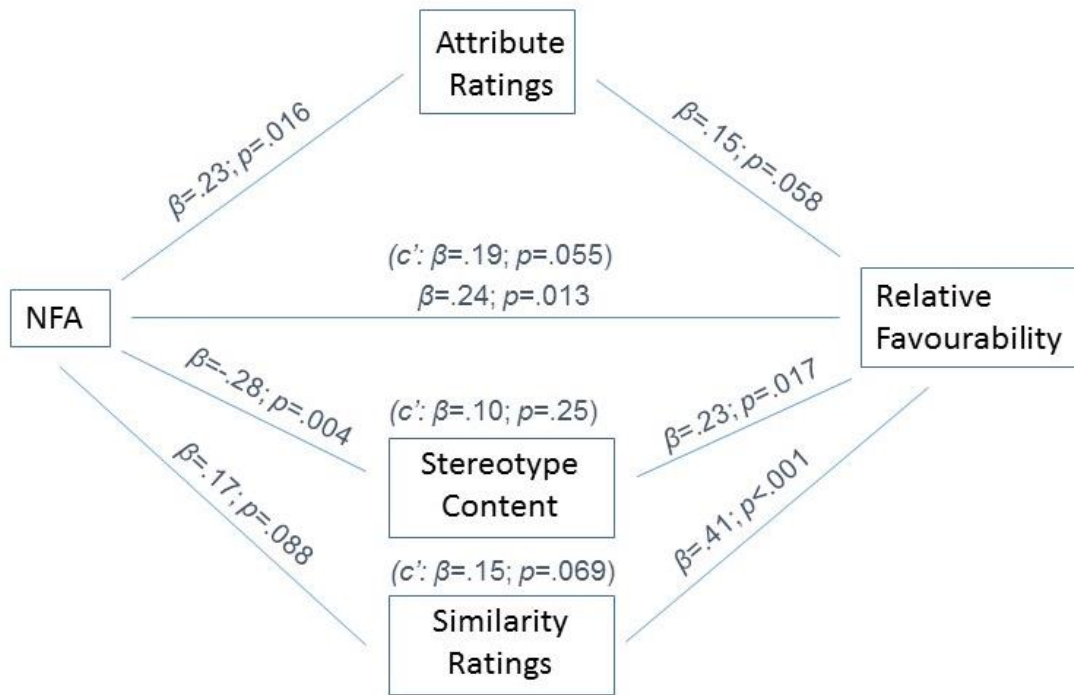


Figure 4. Mediation analyses in Study 6 for the association between NFA and favorability ratings toward the groups. Higher scores on relative favorability indicate that HW/LC groups were perceived more favorably than LW/HC groups. Higher attribute ratings indicate more positivity toward warmth traits than toward competence traits. Higher stereotype content ratings indicate more accentuation along the warmth dimension than along the competence dimension in the perception of groups. Higher similarity ratings indicate that HW/LC groups were perceived as more similar to the self than LW/HC groups.

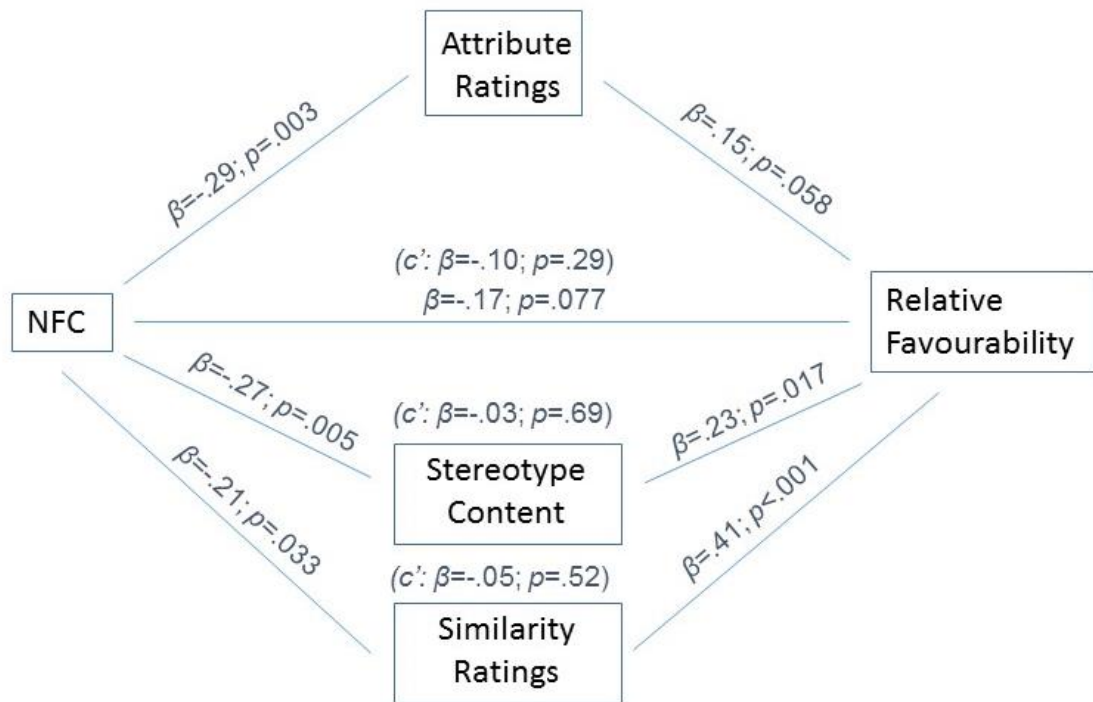


Figure 5. Mediation analyses in Study 6 for the association between NFC and favorability ratings toward the groups. Higher scores on relative favorability indicate that HW/LC groups were perceived more favorably than LW/HC groups. Higher attribute ratings indicate more positivity toward warmth traits than toward competence traits. Higher stereotype content ratings indicate more accentuation along the warmth dimension than along the competence dimension in the perception of groups. Higher similarity ratings indicate that HW/LC groups were perceived as more similar to the self than LW/HC groups.