Don’t Be Afraid!
Competent Women Are Great.

Implicit Gender Attitudes and Stereotypes of Today

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1 Introduction

Gender equality is more than a goal in itself. It is a precondition for meeting the challenge of reducing poverty, promoting sustainable development and building good governance.

—KOFI ANNAN

When Angela Merkel ran for German chancellorship in 2005, passionate debates arose. All of a sudden, both her rivals and conservatively-minded colleagues had to grapple with the fact that for the first time, a woman reached for the country’s most powerful position. Accordingly, most diverse criticism was raised: Some complained Merkel was not enough of a woman and that she would not be able to understand the problems faced by working mothers due to her own childlessness (Spiegel Online, 09/07/05), others accused her of predicking too much on a traditional female role because she had repeatedly emphasized her wish to serve Germany (Hamburger Abendblatt, 09/20/05). Notwithstanding all attempts to cast a slur at her, on September 18th, 2005, Angela Merkel became the first female chancellor of Germany. A few weeks before Germany’s next federal election in September 2009, the ZDF “Politbarometer” (Forschungsgruppe Wahlen e.V., CW 30/09) reported a new record-value of popularity: 79% of the Germans reported to be satisfied with Angela Merkel’s work. Also recently, the U.S. business magazine “Forbes” named her the world’s most powerful woman for the fourth time (Forbes, 08/19/09).

Just before elections, opinion polls of any kind gain tremendous interest. By assessing voters’ current preferences, experts infer first indicators for the election result, and they commonly do so with a considerable degree of accuracy. That is, people’s evaluation of different candidates and election programs often turn out to be valid predictors of their subsequent voting behavior. Put differently, given democratic systems, people’s attitudes ultimately play an essential role in the allocation of political power within their countries. But what are the bases of these attitudes? One of many different factors certainly are the attributes which are ascribed to the candidates. Coming back to Angela Merkel, interestingly, people assign both feminine and masculine attributes to her, that is, she is perceived as both the “mother of the nation” and the “rational scientist”. Possibly, integrating both sides is part of her recipe for success. More generally, people’s attitudes and the application of stereotypic attributes appear to be highly important factors on the most different areas of life (of course, the political sector is only one of innumerable examples). Thus, it seems worthwhile to
examine these constructs scientifically. The present research aims at making a contribution to this goal.

1.1 Gender Attitudes and Gender Stereotypes

Without doubt, gender is one of the most fundamental and salient social categories (A. P. Fiske, Haslam, & Fiske, 1991; Kurzban, Tooby, & Cosmides, 2001; Stangor, Lynch, Duan, & Glass, 1992). Hence, it is not surprising that researchers in social cognition have had much interest in the investigation of gender attitudes and gender stereotypes. One of the most well-known findings initially reported by Eagly and Mladinic (1989) refers to the generally more positive evaluation of women compared to men. This so-called *women-are-wonderful* effect has not only been observed on the explicit level but also when employing implicit attitude measures (Rudman & Goodwin, 2004). Considering that discrimination of women is still an issue of contemporary Western societies, this pattern of gender attitudes appears to be highly surprising and is not yet fully understood. The present research aims at shedding further light on some of the open questions: For example, it is still unexplained how general the female preference is at all, and, rather mixed findings do not yet allow for finally concluding how far the preference for females relates to the attributes stereotypically ascribed to women and men. The latter question appears to be particularly justified when thinking of the *tripartide model* (Katz & Stotland, 1959), suggesting that evaluative responses can be grouped into three different classes: affect, cognition, and behavior. Correspondingly, some researchers conceptualized stereotypes to be the cognitive components of attitudes towards social groups (e.g., Eagly & Mladinic, 1989; for an overview on different perspectives on the attitude-stereotype relationship, see Nesdale & Durkin, 1998). According to the *stereotype content model* (Fiske, Cuddy, Glick, & Xu, 2002) stereotypes of social groups vary along two core dimensions, *warmth* and *competence*. Women and men, given their traditional social roles as breadwinners versus homemakers, are two exemplary groups to which these stereotypes have been applied to: Men are characterized as high in competence but low in warmth, whereas women are characterized as high in warmth but low in competence, or as stated by Wharton (2008, p. 57): “Women are expected to be less competent than men and their contributions are expected to be less valuable.” According to *social role theory* (Eagly, 1987; Eagly, Wood, & Diekmann, 2000) gender stereotypic contents emerge from the distribution of women and men into certain social roles and should adapt to changes of these roles. Such a change in gender roles can currently be observed in the way that women, next to

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1 When we use the term “female preference” we refer to the more positive evaluation of women compared to men on average, not to the fact that women are preferred to men by both women and men.
their responsibility of domestic duties, increasingly take part in the labor force, whereas an equivalent increase in men taking over the role of the homemaker cannot be recorded. In line with social role theory, studies in the U.S. and Germany revealed that women are increasingly associated with stereotypically male attributes, such as competitive and dominant, while still (although in part decreasingly) being perceived as stereotypically female, such as sensitive and supportive (Diekman & Eagly, 2000; Wilde & Diekman, 2005). With respect to the stereotypes of men, however, no substantial changes were observed. The consideration of attributes that spontaneously come to mind when thinking of women and men appears to be a meaningful avenue to a deeper understanding of gender attitudes. This is why the first part of this work addresses the investigation of contemporary gender stereotypes, whereas the second part concerns concrete aspects of gender attitudes, among them the interplay of gender attitudes and gender stereotypes.

1.2 Basic Principles of the Present Research

The current work is characterized by a series of main features which will be introduced in the following section together with explanations why we regarded them as vital to consider.

1.2.1 Implicit Measurement

In recent years, social psychology has witnessed a tremendous interest in automatic processes and implicit cognition (e.g., Greenwald & Banaji, 1995). One field of research considerably affected by this development has been the study of attitudes. Implicit attitudes are referred to as evaluations that are triggered automatically by the mere presence of the attitude object, often without a person’s awareness and control (e.g., Bargh, 1994; Devine, 2001; Rydell, McConnell, Mackie, & Strain, 2006). Whereas previous models conceptualize implicit and explicit attitudes as a dichotomy (e.g., Wilson, Lindsey, & Schooler, 2000), other approaches assume only one cognitive representation that can be tapped either implicitly or explicitly (e.g., Fazio, 1990). More recently, Cunningham, Zelazo, Packer, and Van Bavel (2007) introduced an iterative reprocessing model assuming that evaluative processing occurs on a continuum from relatively automatic to relatively reflective processing. The debate on whether implicit and explicit attitudes (stereotypes) are distinct constructs has not been settled yet and is beyond the scope of the current work. When we use the term implicit attitudes (implicit stereotypes) in the following, we refer to automatic evaluative (semantic) processes that tap associative rather than reflective bases of information processing (cf. Gawronski & Bodenhausen, 2006; Strack & Deutsch, 2004).
Two major reasons argue for the complementary use of implicit measures. Other than direct measures (e.g., self-reports), they rely neither on participants’ willingness to report private knowledge nor to their ability to report this knowledge accurately (Greenwald et al., 2002). The first aspect is crucial whenever socially delicate topics are addressed. In such situations, people typically prefer not to unveil their personal beliefs due to social desirability. Gender attitudes and stereotypes belong to those topics which are particularly prone to intentional distortion: After all, who is willing to overtly admit that he or she judges women the incompetent sex while knowing that equal rights represent a salient societal goal? To give an example, Rudman and Kiliasnski (2000) examined implicit and explicit attitudes towards female and male authorities by using a priming task as well as self-report measures. Their results revealed that women showed less explicit prejudice against female authorities than men did, but on the implicit level, women’s attitudes were similarly negative. Next to deliberate deception, however, it could be that the female participants themselves were agnostic of their automatic prejudice explained by the fact that people’s ability to introspect is limited (Nisbett & Wilson, 1977). This points to the second benefit of implicit measures. As shown in numerous studies, attitudes and stereotypes can be automatically activated, even in the absence of people’s awareness (e.g., Devine, 1989; Fazio, Sanbonmatsu, Powell, & Kardes, 1986). For example, Banaji and Hardin (1996) demonstrated the automatic activation of gender stereotypes, which in turn might be applied to judgments of female and male individuals (Banaji, Hardin, & Rothman, 1993). In other words, it could be that a manager automatically ascribes more competence to her male rather than female employees, without being aware of it, and that this implicit stereotype finally influences her behavior (e.g., Rudman & Glick, 2001). Observing effects of automatic gender knowledge seems to be meaningful because gender attitudes and stereotypes are expected to be shaped by early experiences and culturally held appraisals which belong to the main sources of implicit cognition (Rudman, 2004).

Taken together, previous considerations illustrate the importance of implicit measures, especially when addressing issues prone to social desirability or inaccessibility, as it must be expected for the study of gender attitudes and stereotypes. For these reasons, an implicit approach was chosen for the current research.

1.2.1.1 The Implicit Association Test

In the first place, the present work is based on Implicit Association Tests (IATs, Greenwald, McGhee, & Schwartz, 1998; for a review, see Lane, Banaji, Nosek, & Greenwald,
which presumably constitute today’s most crucial class of implicit measures. IATs seek to assess the relative strength of implicit associations between concepts and evaluations (attitude IATs), or concepts and a given set of semantic attributes (stereotype IATs). Inferring a person’s underlying attitude from her associative strength between a concept and its valence should be permissible because an attitude is assumed to be the association of an attitude object and its evaluation (Fazio et al., 1986; Judd, Drake, Downing, & Krosnick, 1991). The same rationale holds true for the measurement of stereotypes where associations between social groups and semantic attributes are assessed.

The experimental procedure of an IAT is simple. It comprises two binary classification tasks, one that requires the assignment of so-called target stimuli to either one of two target concepts (e.g., women vs. men), and another in which so-called attribute stimuli have to be allocated to either one of two attribute concepts (e.g., positive vs. negative). In two combined categorization tasks participants have to classify stimuli on both the target and attribute dimension during the same task with only two response options. Faster responses should be observed for category combinations that are associatively related than for those that are inconsistent with the respondent’s underlying associations. For example, if someone has a more positive attitude towards women than towards men, faster reactions should be observed during the task where women and positive/men and negative have to be grouped together. The difference in reaction time between the two tasks, namely the IAT effect, is taken as an indicator for attitude strength.

Concerning IATs’ psychometric properties, their reliability estimates are comparatively satisfactory, with high internal consistencies ranging from .70 to .90 (Nosek, Greenwald, & Banaji, 2007), but lower test-retest reliabilities ranging from .25 to .69, with mean and median test-retest reliabilities of .50 (Lane et al., 2007; also see Steffens & Buchner, 2003). IATs’ validity has been numerous demonstrated by known-groups approaches (e.g., Banse, Seise, & Zerbes, 2001; Greenwald et al., 1998; Rudman, Greenwald, Mellott, & Schwartz, 1999; Steffens, 2005; Teachman, Gregg, & Woody, 2001), moreover, some studies have found that IATs predict behavior (e.g., Rudman & Glick, 2001; Steffens & Schulze-König, 2006) and often show at least moderate correlations with related explicit measures (e.g., Steffens & Buchner, 2003; Steffens & Plewe, 2001; but also see Bosson, Swann, & Pennebaker, 2000). On the other hand, different researchers have argued for alternative explanations of IAT effects, as for example by referring to cognitive abilities (e.g., task-switching, Mierke & Klauer, 2003), or figure-ground compatibilities (Rothermund & Wentura, 2001, 2004). Furthermore, it was shown that IAT effects are not only driven by
associations between superordinate categories (e.g., women and pleasant) but also by cross-category associations of the stimuli used for representing the categories (e.g., pretty, touchy, Steffens & Plewe, 2001). In order to circumvent such additional influences of stimuli, Steffens, Kirschbaum and Glados (2008) proposed to merely use the concepts themselves along with their synonyms as stimuli. They demonstrated that such a Concept Association Task (CAT) revealed similar effect sizes as IATs, and even showed somewhat higher correlations with other implicit measures and self-reports.

Altogether, there has been an enormous amount of research providing a deeper understanding of IATs’ properties and their underlying processes, albeit a number of questions are not fully answered yet. What can be concluded so far, however, is that IATs constitute a worthwhile contribution to the tools of implicit measurement, and, given the knowledge and consideration of their potential shortcomings, the measure’s assignment in studies on implicit cognition seems to be definitely advisable (also see Kite, Deaux, & Haines, 2008).

1.2.2 Diversity of Measures

Much of the research on implicit gender attitudes and stereotypes was conducted by using IATs. However, as already mentioned in the foregoing paragraph, a number of confounding factors of IAT effects have been reported in the literature (for an overview, see Teige-Mocigemba, Klauer, & Sherman, in press). For instance, Rothermund and Wentura (2001; 2004) proposed salience asymmetries within the target and attribute categories to produce compatibility effects in IATs. As another example, Karpinski and Hilton (2001) argued that IAT effects rather reflect culturally shared instead of personal knowledge. Chapter 3.1 exemplifies how such potential factors could alternatively evoke the common pattern of implicit gender attitudes. In order to rule out IAT-specific artifacts, the current research complemented IAT findings with other measures of implicit cognition (Go/No-go Association Tasks, GNATs, Nosek & Banaji, 2001; Response Window Priming, RWP, Greenwald, Draine, & Abrams, 1996).

1.2.3 Diversity of Samples

A remarkable amount of research on gender attitudes and stereotypes has been based on student samples, as it is common practice in social psychological studies. However, this appears to be a serious grievance, in particular when studying gender-related issues: Students should be characterized by an over-average egalitarian approach which is reasonable facing both their daily exposure to counter-stereotypic women (be it in the form of female fellow
students or female professors, cf. Dasgupta & Asgari, 2004) and their level of education (Wagner & Zick, 1995). Besides, student samples are restricted to a relatively narrow range of age, thus disallowing to infer generality of given findings to other age groups. Furthermore, young adulthood is characterized by certain aspects that should exert a specific impact on gender attitudes, for example when thinking of dating as one typical feature of this lifespan (cf. Havighurst, 1948). Based on these considerations, the current research included samples heterogeneous in age and occupational background.

1.3 Outline of the Dissertation

Starting point of the present research was the well-known finding that females are preferred to males on a general evaluative dimension. Although a number of valuable contributions have been made that helped to gain a deeper understanding of the women-are-wonderful effect (e.g., Rudman & Goodwin, 2004), it has not been fully understood with regard to its correlates, range and limits, yet. The current work was conducted in order to shed further light on some of the open questions. However, when approaching the study of gender attitudes, or more specifically, when asking for possible reasons why one social group is generally preferred to another, as a preceding step, it appears to be meaningful to first concern with the attributes that are typically ascribed to the groups of interest (i.e., stereotypes).

Following to this introduction, Chapter 2 presents our first line of research which aimed at investigating contemporary contents of implicit gender stereotypes. For this purpose, five studies were conducted where gender-competence (Studies 1a–2) and gender-warmth associations (Studies 3 & 4) were assessed, based on different implicit measures and diverse samples.

Chapter 3 addresses implicit gender attitudes that were examined in five additional studies. Study 1 served for ruling out that the implicit preference is an artifact of measurement method. Studies 2–4 investigated the interplay of gender attitudes and gender stereotypes (Studies 2 & 4), and gender roles, respectively (Study 3). Study 5 tested whether females’ evaluative advantage is also obtainable when the general evaluative dimension is replaced by a dimension of respect (*highly considered vs. inconsiderable*, instead of *positive vs. negative*) in an IAT.

In a final discussion (Chapter 4), several issues related to the present findings will be considered. For example, we will seize on the question whether evaluatively unbalanced stereotype IATs capture self-favorability processes instead of stereotypic associations
(Rudman, Greenwald, & McGhee, 2001), and how far this might affect the interpretation of current findings.
2 Competent and Cold Men–Competent and Warm Women: Implicit Gender Stereotypes Correspond to Changes in Gender-Role Allocation

The following chapter focuses on contemporary implicit gender stereotypes. First, stereotypes on men and women will be considered from a social structural perspective. Varying and consistent aspects of today’s gender roles and gender stereotypes will be illuminated, and past and present research will be related to each other. Second, a series of studies will be presented, each followed by a brief discussion. Third, findings will be discussed in detail.

2.1 Gender Stereotypes: A Social Structural Perspective

Based on considerations with regard to interpersonal and intergroup interactions, Fiske and colleagues (2002) proposed a stereotype content model predicting two core dimensions of stereotypes: warmth and competence. The authors argued that in interpersonal and intergroup situations, people are primarily interested in other people’s goals or intent (positive or negative) that might affect the self or the ingroup, as well as the counterpart’s capability to pursue those goals. These characteristics correspond to perceptions of warmth and competence: Positive goals relate to warmth, high capability relates to competence. With respect to the sex groups, the authors found that given the traditional distribution of women into the role of the homemaker and men into the role of the breadwinner, women are generally seen as high in warmth but low in competence, whereas men are generally seen as high in competence but low in warmth. Similarly, Glick and Fiske (1996) differentiated between benevolent attitudes towards traditional women, who are viewed as warm but not competent outside the home, and hostile attitudes towards non-traditional women, who are viewed as competent but not warm. Bakan (1966) suggested two dimensions of stereotypes closely related to the competence-warmth distinction: Agency refers to “a concern for one’s self-interests” (Matlin, 1993, p. 252), and comprises characteristics that are judged as typically male such as self-assertion, ambition and independence, whereas communion refers to “a concern for one’s relationship with other people” (p. 253) and comprises characteristics that are judged as typically female such as selflessness, sensitivity, and care. Competence is regarded as one core aspect of agency, whereas warmth and communion are seen as essentially identical (cf. Abele & Wojciszke, 2007). The cardinal differentiation of masculine and feminine attributes along these concepts is reflected by a range of psychological findings,
such as the women-are-wonderful effect (Eagly & Mladinic, 1989), referring to the ascription of features such as nice and attentive to females, or the think manager-think male phenomenon, referring to the association of men and leadership qualities (see Schein, 2001, for a review). Social role theory (Eagly, 1987; Eagly et al., 2000) offers a social structural account on such pervasive stereotypic contents by postulating that perceived sex differences in social behavior can be traced back to different social roles that are sex-typically assigned to women and men. More concretely, women are more frequently encountered in the role of the homemaker or in occupations similar to the domestic role (such as kindergarten teacher or nurse; also see Cejka & Eagly, 1999), whereas men typically take over the role of the breadwinner and are more often located at higher levels within the occupational hierarchy. Social role theory argues that women and men adjust to their sex-typical roles by acquiring the specific skills and resources linked to successful role performance and by adapting their social behavior to role requirements (Eagly et al., 2000). As demonstrated by Eagly and Steffen (1984), the attributes that are perceived as typical for the role of the (female) homemaker correspond to communion, whereas the attributes that are perceived as typical for the role of the (male) breadwinner correspond to agency. Consequently, women have gradually become associated with communion and men with agency.

2.2 Contemporary Gender Roles

Although the traditional allocation of gender roles generally appears to be deeply embedded in a culture, remarkable changes have been observed recently. That is, the roles of men and women have become more similar over the last decades, primarily accounted for by women’s increased entry into the employee role. Specifically, there was an increase in labor force participation among women from 43% to 59% between 1970 and 2004 in the U.S., whereas the participation among men decreased from 80% to 73% (U.S. Department of Labor, 2005). A micro-census of the German Federal Office of Statistics draws a similar picture, albeit on a smaller time scale, indicating progressive convergence in employment figures of men and women living in Germany. Referring to the labor population the percentage of women increased from 42% in 1996 to 45% in 2004, whereas the percentage of men decreased from 58% to 55%. Moreover, an increase in women taking over leadership positions was reported, from 10% in 1996 to 21% in 2004 (German Federal Office of Statistics, 2006).

Opposed to these movements within the occupational domain, comparable changes respecting the domestic role have not taken place. A large-scale study on contemporary
gender division of labor in Germany (Kuenzler, Walter, Reichart, & Pfister, 2001) revealed that women still spend nearly twice as much time on household chores and child care as men. Similarly, the German micro-census of 2005 showed that 56% of working mothers having a child younger than three years of age have taken parental leave, whereas only 3% of the working fathers have made use of this opportunity (German Federal Office of Statistics, 2006). Likewise, in a Gallup Poll in 2008 addressing the division of household chores within married couples living in the U.S. 54% of the married respondents reported that the wife cared of the children on a daily basis, whereas only 9% reported that this duty was attended by the husband. A comparable distribution was found for chores such as “prepare meals” (58% vs. 14%), “do laundry” (68% vs. 10%), and “clean the house” (61% to 6%, Newport, 2008). In short, whereas women have substantially increased their occupancy of the employee role, men have not comparably increased their occupancy of the domestic role (Shelton, 1992). A similar asymmetry can be observed within the occupational domain, in that men have not entered female-dominated occupations to the same extent as women have entered male-dominated occupations (England, 2003).

2.3 Contemporary Gender Stereotypes

As previously mentioned, the research by Eagly and Steffen (1984; for similar findings, see Pratto & Bargh, 1991) revealed associations of sex-typical roles and gender-stereotypic traits, irrespective of the stimulus person’s sex, that is, male and female employees were perceived as high in agency, but low in communion, whereas female and male homemakers were perceived as high in communion, but low in agency (but also see Bosak, Sczesny, & Eagly, 2008, who pointed to response format as additional factor next to role information in communion and agency judgments). Considering these findings, the question arises whether the observed changes in gender roles might be accompanied by systematic changes in stereotypic perceptions of women and men, as social role theory would suggest. Diekman and Eagly (2000; also see Diekman, Eagly, Mladinic, & Ferreira, 2005; Wilde & Diekman, 2005) examined perceivers’ beliefs about the typical attributes of women and men over a time span of 100 years (starting in the past and projected onto the future) and their relationship with estimates of role non-traditionalism. Results revealed perceptions of increasing role equality over time and a corresponding convergence in the perceived characteristics of men and women. This convergence was primarily accounted for by an increase in ascribing masculine personality characteristics (e.g., competitive and dominant) to women, which is in line with the authors’ reasoning that the greatest change in gender roles is
due to women’s entry into male-dominated occupations (but also see Lueptow, Garovich-Szabo, & Lueptow, 2001). Furthermore, there was only a modest increase in ascribing feminine personality characteristics (e.g., sensitive and supportive) to men, interpreted as a reflection of the very limited movement of men into female-dominated roles. Diekman and Eagly’s findings are in line with work on sex differences in self-reported personality traits (Twenge, 1997). A meta-analysis of 63 studies showed an increase in women’s endorsement of masculine personality traits and men’s continued nonendorsement of feminine personality traits over 20 years. In further meta-analyses covering a time period from 1931 to 1993, Twenge (2001) showed that women’s self-reported assertiveness closely follows trends in their social status and roles (for an overview on studies examining the dynamics of gender beliefs and sex-stereotyped personality traits, see Sczesny, Bosak, Diekman, & Twenge, 2007).

### 2.4 Past and Present Research

However promising the changes in stereotypes on women may be, the question arises how far they actually correspond to people’s internalized or private beliefs (cf. Rudman et al., 2001). Could it be that the changes observed reflect the degree of egalitarian beliefs prescribed by contemporary society? As outlined in the introduction of this work, equalization of men and women represents a salient societal goal, thus making it quite probable that self-monitoring processes exert a substantial influence when assessing people’s gender stereotypes. This is why we regarded it as meaningful to test whether the pattern of explicit gender stereotypes reported recently (e.g., Diekman & Eagly, 2000; Diekman et al., 2005; Wilde & Diekman, 2005) is also observable when choosing an implicit approach. Indeed, a good deal of past work addressed the study of implicit gender stereotypes. The majority of these studies is based on Implicit Association Tests (IAT, Greenwald et al., 1998) and focuses on the dimensions of communion and agency, or warmth and potency. For example, Rudman and Kilianski (2000) showed gender stereotypic associations in an IAT tapping communal and agency, for both male and female participants (also see Rudman & Glick, 2001). Similarly, students and male managers in Germany showed gender stereotypic associations in an IAT tapping communion and assertiveness (Steffens & Mehl, 2003). A common feature of these and many other IAT studies on gender stereotypes refers to the fact that two stereotypic dimensions (e.g., communion and agency) are considered simultaneously. However, such an arrangement does not allow for concluding whether females and males are stereotypically associated with communion and agency or whether only one of these dimensions drives the
overall IAT effect. For instance, an implicit gender stereotype with regard to communion would suffice to produce an IAT effect, in the absence of differences in agency associations (e.g., Blanton, Jaccard, Gonzales, & Christie, 2006). One of few exceptions was provided by Rudman and colleagues (2001; also see Carpenter, 2000; Richeson & Ambady, 2001) who examined gender-warmth and gender-potency associations based on separate IATs (notice that findings turned out to be highly depend on whether stereotypic contents were in accord with people’s self-concepts, as amplified later in this work). In order to disentangle the partial impact of different stereotypic contents, in the present research, each IAT assesses only one stereotype dimension. Furthermore, for the sake of ensuring generality and in order to gain a deeper understanding of IAT findings (see 2.5–2.7, and 3.1, for a detailed discussion), our studies were complemented by further implicit measures (Go/No-go Association Tasks, GNATs, Nosek & Banaji, 2001, and a Response Window Priming, RWP, Draine & Greenwald, 1998; Greenwald et al., 1996).

One crucial difference between our work and the vast majority of previous studies on implicit gender stereotypes is that we focus on the dimensions postulated by the stereotype content model (Fiske et al., 2002), warmth and competence. From an evaluation-based point of view, competence is the most interesting aspect of differences in the ascription of agency to different social groups. Words such as capable are much more positively evaluated than ambitious or goal-oriented (Hager & Hasselhorn, 1994). Implicit ascriptions of incompetence to a social group are much more problematic than implicit ascriptions of a lack of other aspects of agency. As early as the 1960s, it was shown that the work of allegedly male authors was judged as significantly higher in quality compared to identical essays that were allegedly written by females (Goldberg, 1968). The fact that this study was exclusively based on female participants emphasizes the prevalence of a male-competence stereotype at that time (but also see Kasof, 1993; Swim, Borgida, Maruyama, & Myers, 1989, for critical aspects of this research). Williams and Best (1982; 1990) investigated gender stereotypes in a large-scale multination study. Participants were asked to rate adjectives as characteristic rather of men or of women. One of these adjectives close to competence – capability – was judged as highly characteristic of men across 25 nations, thus showing the strength and prevalence of male-competence associations at that time. Considering the substantial increase of women who have taken over competence-associated roles over the last decades the question is whether men and women are currently associated with competence more equally, and whether this also affects the automatic level of cognition. The notion that implicit gender stereotypes are susceptible to gender roles prevalent in a given social environment received first empirical
evidence by Dasgupta and Asgari (2004): Frequently observing women in agentic roles led to a mitigation of implicit gender stereotypes over one year.

Based on the preceding considerations, we expected no substantial departure from the gender-warmth stereotype, that is, women were assumed to be more strongly associated with warmth compared to men, on the automatic level. With respect to the competence dimension, we assumed that traditional gender stereotypes no longer constitute the primary source of gender-competence associations. Instead, there should be more balanced ascriptions of competence to both sex groups. One finding previously reported in the literature which points towards a departure from general men-competence/women-incompetence associations was reported by Richeson and Ambady (2001). Using a gender competence IAT, they found an association of own group with competence for both male and female participants. The authors argued that this unexpected pattern of data might reflect the fact that their female participants were “highly motivated, competent women attending an exclusive, competitive university” (p. 504). We suggest that this finding is not due to a highly selective sample but might rather be explained by a general departure from ascribing competence exclusively to men. Possibly, when using stereotype IATs, which are based on the direct comparison of two social groups (in this case men versus women), alternative processes might be triggered. One such process could be ingroup enhancement\(^2\), as suggested by social identity theory (Tajfel & Turner, 1986): In order to establish a positive social identity, people generally tend to perceive their ingroup in a more positive light compared to a given outgroup. Conceivably, ingroup enhancement is one factor that contributed to the pattern found by Richeson and Ambady (2001).

In Studies 1a and 1b, we considered samples heterogeneous in age and occupational background to test contemporary gender-competence associations by using IATs. Findings were supplemented by Study 2 where gender-competence GNATs were employed. In Studies 3 and 4, gender-warmth associations were examined using different implicit measures. Put shortly, a multi-measure (IAT, GNATs, RWP) multi-group (samples of varying age and occupational background) approach was chosen in order to investigate implicit gender stereotypes regarding warmth and competence. In the following section, our studies will be reported in detail, along with brief discussions of the findings obtained.

2.5 Study 1a

The objective of Study 1a was to test contemporary implicit gender stereotypes with

\(^2\) The terms ingroup enhancement and self-favoritism are used interchangeably in the following because their differential impact is not of interest here. Strictly speaking, these concepts are of course not identical.
respect to competence by using a gender competence IAT. For the sake of generalizability, five different groups were taken into consideration: male managers, female managers, male students, female students, and female women’s representatives. Departing from predictions based on traditional gender stereotypes we did not expect to find implicit associations of men and competence across all participants. Possibly, corresponding to what was found by Richeson and Ambady (2001), we might instead observe general associations of own sex and competence.

2.5.1 Method

2.5.1.1 Participants

Participants were 89 men and women of varying age and different occupational background. There were five groups of participants: male managers \((N = 16; \text{mean age} = 50, SD = 10)\), female managers \((N = 16; \text{mean age} = 47, SD = 11)\), male students \((N = 20; \text{mean age} = 23, SD = 3)\), female students \((N = 21; \text{mean age} = 23, SD = 2)\), and female women’s representatives \((N = 16; \text{mean age} = 43, SD = 9)\). Data were collected in a town and the surrounding rural area in the west of Germany. Students received candy and course credit for participating.

2.5.1.2 Materials

A gender competence IAT was applied. Translations of the German stimuli used for the IAT were as follows: Man and woman served as both target concepts and target stimuli, the sex symbols ♂ and ♀ were used as additional target stimuli. Competent and incompetent served as attribute concepts and attribute stimuli. As further attribute stimuli capable and incapable were used. There were two blocks of trials where the concepts men and competent, and women and incompetent were combined (henceforth, the congruent task), and two blocks with reversed combinations (henceforth, the incongruent task). Block comprised 40 trials each. Two response keys on the keyboards that should be used for reacting were marked with colored dots.

2.5.1.3 Procedure

Managers and women’s representatives were visited at their workplace. The IAT program was run on an iBook. Students participated at an iMac in a cubicle. All instructions and tasks were presented and performed on the computer. Before the study started, participants were asked for demographic data (sex and age). Stimuli of the concept dimension
(e.g., ♂ and ♀) and the attribute dimension (e.g., capable and incapable), presented in a constant random order, were shown in the middle of the computer screen and had to be assigned via key-pressing to the four super-ordinate concepts displayed in the upper left and right corner of the screen. Upon a key press, the stimulus disappeared, and 200 ms later, the next stimulus was shown. After an incorrect response, the letter “F” appeared. After each block a feedback was given informing participants on their mean error rate and mean reaction time. If the error rate exceeded 10% they were asked to react more slowly and more accurately in the following. Task order was constant, with all participants beginning with woman and competent/man and incompetent (i.e., the incongruent task).

### 2.5.2 Results

All analyses reported in the following were conducted with \( \alpha < .05 \). As an indicator of the effect size, \( \eta^2_p \) is reported (Cohen, 1977). For all IAT studies reported in the present chapter an effect similar to the IAT D effect was computed (Greenwald, Nosek, & Banaji, 2003). Specifically, no reaction times were excluded from analyses, and for each participant the difference between the mean reaction times in the congruent and the incongruent IAT task was divided by their overall standard deviation. There was no error penalty. All gender competence IAT effects reported in the present chapter were coded such that positive values indicate a stronger association of men and competence (and women and incompetence). The internal consistency of the IAT effect was Cronbach’s \( \alpha = .87 \) (cf. Steffens & Buchner, 2003).

The upper part of Figure 1 shows IAT effects separately for each group. As expected, male participants showed an association of men and competence, \( t(35) = 5.03, \eta^2_p = .42 \), interestingly, female participants showed an association of women and competence, \( t(52) = -2.89, \eta^2_p = .14 \). Accordingly, there was a significant effect of participant sex, \( t(87) = -5.62, \eta^2_p = .27 \). Explorative analyses revealed stronger associations of own sex and competence for male compared to female participants, \( t(87) = -4.33, \eta^2_p = .18 \). A 5-level univariate ANOVA with participant group as between-subjects factor showed a significant effect of participant group, \( F(4, 84) = 10.32, \eta^2_p = .33 \). According to LSD Post Hoc Tests, male managers showed a larger association of men and competence than all other groups, and their association was significantly different from zero, \( t(15) = 7.01, \eta^2_p = .77 \). Male students showed a smaller, but still significant men-competence association, \( t(19) = 2.03, \eta^2_p = .18 \). Interestingly, the group of the women’s representatives showed no significant gender-competence association, \( t(15) < 1, \eta^2_p = .02 \). An association of women and competence was descriptively found for female managers, \( t(15) = -1.46, \eta^2_p = .12, p = .17 \), and was significant for female students, \( t(20) = \)
−2.79, $\eta^2_p = .28$ (one-tailed). Before turning to a discussion of these results, a replication and extension study is reported.

![Study 1a](image1.png)

![Study 1b](image2.png)

Figure 1. Associations of competence and sex group obtained by a gender competence IAT applied in Studies 1a, 1b, and 2. IAT effects are displayed separately for each participant group. A positive effect indicates an association of men and competence, whereas a negative effect indicates an association of women and competence. Error bars reflect standard errors.
2.6 Study 1b

The aim of Study 1b was to extend our findings to a sample of a broader age range. Next to checking for the generality of the previously obtained own-sex-competence associations, we were interested in whether there was an effect of age. Gender stereotypes could be more deeply embedded in older than younger people because the former have been exposed to the traditional structure of gender roles over a considerably longer period of time. Thus, the process of adjusting one’s gender stereotypes to the changed pattern of gender roles might happen more slowly for older than younger people, possibly reflected in stronger traditional gender-competence associations with increasing age. Because IATs do not allow for disentangling traditional gender-competence stereotypes from ingroup enhancement in case of male participants such an age-related effect should be observable especially for female participants, reflected in an interaction of sex and age on gender-competence associations.

2.6.1 Method

2.6.1.1 Participants

Participants were 94 visitors of the open house at a university in the east of Germany. They were offered to take part in psychological studies that would reveal automatic cognitions, 57% were female. Their age ranged from 11 to 69 (M = 28, SD = 11).

2.6.1.2 Materials & Procedure

The stimuli in the gender competence IAT were those used in Study 1a with the exception that instead of the sex symbols ♂ and ♀ the German words for male and female were used as target stimuli. The procedure followed that of Study 1a, but this time task order was counterbalanced and there were two congruent and two incongruent blocks of 22 trials each.

2.6.2 Results

Since results of all studies reported in this chapter were unaffected by task order, all data were collapsed across the two task-order conditions. Again, as can be seen in Figure 1, male participants showed an association of men and competence, t(39) = 4.99, $\eta^2_p = .39$, whereas female participants showed an association of women and competence, t(53) = -1.94, $\eta^2_p = .07$ (one-tailed). Analogously to Study 1a, men showed a stronger association of own sex and competence compared to women, t(92) = -2.44, $\eta^2_p = .06$. 
So far, results again revealed automatic associations of own sex and competence, clearly pronounced for male and somewhat weaker for female participants. In order to check for an effect of age a stepwise regression was conducted on the IAT effect. The first step showed the same participant sex effect as above, $R^2 = .21$, $F(1, 92) = 24.99$. Neither participant age nor the interaction of sex and age entered in the second step could explain a significant additional portion of the variance, $R^2_{\text{change}} = .001$, $F_{\text{change}}(2, 90) = .06$. Thus, our findings on automatic associations of own sex and competence seem to generalize across different age groups.

### 2.6.3 Discussion of Studies 1a and 1b

In contrast to traditional gender stereotypes characterizing men as high and women low in competence, we observed a deviating pattern of automatic gender-competence associations. Instead of general men-competence associations, Study 1a revealed associations of own sex and competence for both male and female participants. Exploratory analyses showed that the male managers revealed the strongest men-competence associations. We will come back to this finding in the General Discussion of this chapter. Automatic associations of own sex and competence were also found when drawing on a broader age range (Study 1b). Thus, even higher age groups who should have been exposed to traditional gender roles considerably longer compared to young people did not show a traditional gender-competence stereotype. Possibly, even well-established implicit stereotypes can be changed more easily than it had been expected (see Blair, 2002, for a review on the malleability of implicit cognition).

In summary, findings of Studies 1a and 1b revealed that people heterogeneous in age and occupational background do no longer show general associations of men and competence/women and incompetence which is in line with changes in gender roles, primarily accounted for by women’s increasing participation in competence-associated domains. Interestingly, stronger associations of own sex and competence were found for men compared to women, which is in line with the still existing (though declining) majority of males in competence-associated roles in contemporary society.

What we do not know so far, is whether the observed associations of own sex and competence are basically driven by a process of ingroup enhancement or whether they actually reflect a profound change in gender-competence perceptions. As Rudman and colleagues (2001) showed, underlying stereotypes can be veiled by self-favoring processes, which particularly holds true for such stereotype measures that yield evaluatively unbalanced
attribute stimuli (e.g., positive attributes representing competence, and negative attributes representing incompetence), as it was the case in both the work of Richeson and Ambady and in our Studies 1a and 1b. This is why we cannot preclude the possibility that an underlying men-competence/women-incompetence stereotype was simply overlaid by self-favoritism (we come back to the work of Rudman and colleagues, 2001, in more detail later in this work). In order to gain further insight into the underlying processes, we decided to employ gender competence GNATs in a further study. GNATs allow for considering both target groups, men and women, separately (see 2.7). That means, it is possible to assess associations between the other sex and competence, without relating it to the ingroup. This way, we should be able to determine whether still existing men-competence/women-incompetence perceptions were merely veiled by ingroup enhancement in Studies 1a and 1b, or whether these findings actually point to a change of stereotypic associations. This question should be clarified especially when considering male participants’ responding in a women competence GNAT: Finding a women-competence association for men would further indicate that nowadays also women are perceived as competent. Furthermore, using an additional measure of implicit cognition would allow for a test of generality of our previous findings.

2.7 Study 2

In Study 2 the GNAT, a derivative of the IAT, was applied. It allows for separately assessing associations of women or men and competence. If a still existing stereotype of men and competence/women and incompetence was veiled by ingroup enhancement in Studies 1a and 1b, we would expect women-incompetence associations especially for male participants in a women competence GNAT. If there has been a general change in gender-competence perceptions instead, with more balanced ascriptions of competence to both sex groups, women-competence associations should be revealed. Furthermore, due to the continuous presence of men in competence-related roles it is assumed that both men and women show men-competence associations in a men competence GNAT. Next to the GNATs a gender competence IAT served as control condition in Study 2.

2.7.1 Method

2.7.1.1 Participants

Participants were 199 students at a university in the east of Germany, 69% were female. Their age ranged from 18 to 39 years ($M = 22, SD = 3$). They were compensated with course credit and candy.
2.7.1.2 Materials

*Gender competence IAT.* The same gender competence IAT was used as in Study 1b, with two blocks of 40 trials each in the congruent and incongruent task.

*Gender competence GNATs.* The GNAT works according to the same principles as the IAT, with the difference that automatic associations are assessed with respect to a *single* target concept (only *man* or *woman*). For example, participants react to *woman* and *competent* in one task and to *woman* and *incompetent* in another task, without including the target concept *man* at all (although this is also a possible option). Different from the IAT, in a GNAT only one response key is used (the space bar). If a stimulus, appearing in the middle of the screen, belongs to one of the two categories displayed on the top, the participants are asked to press the space bar ("go response"). If the stimulus does not belong to any of the two categories, the participant is asked not to react ("no-go response").

Two different GNATs were administered within subjects: a men competence GNAT and a women competence GNAT. Stimuli were chosen in analogy to those used in the gender competence IAT. Each GNAT consisted of two tasks (e.g., men and competent vs. men and incompetent in the men competence GNAT), each comprising 32 trials. Practice blocks of 8 trials each were included: In the first one, participants practiced reacting to stimuli of the attribute dimension, in the second one, participants practiced simultaneous reacting to stimuli of both the target and attribute dimension. After the first task within a GNAT, a further practice block followed where the reversed reaction towards stimuli of the attribute dimension was practiced. Finally, before the second GNAT started, participants practiced reacting to the new target dimension (e.g., women, when the women competence GNAT was administered second) and the attribute dimension, simultaneously.

2.7.1.3 Procedure

Participants were randomly assigned either to the gender competence IAT or to the gender competence GNATs. The procedural parameters of the gender competence IAT were the same as in the IAT used in Study 1b. Participants in the GNAT condition were informed that subsequently category labels would appear in the upper middle of the screen. Every time a stimulus appeared that belonged to one of the two categories presented on the top, participants should react by pressing the space bar; whenever a stimulus did not belong to the categories participants should not react at all. The category labels (e.g., *men* and *competent* in the congruent task of the men competence GNAT) remained visible throughout each block. Each stimulus appeared in the middle of the computer screen 200 ms after the last response
had been given. Participants had to react within 1000 ms, and reaction times were measured. Order of GNATs (women competence GNAT first vs. men competence GNAT first) was counterbalanced, and so was the order of GNAT tasks (e.g., women and competent first vs. women and incompetent first) in the first GNAT. Participants always responded to the same attribute concept (e.g., competent) in the first task of the second GNAT as in the second task of the first GNAT.

### 2.7.2 Results

The GNAT-men effect was coded such that a positive effect indicates an association of men and competence, and the GNAT-women effect was coded such that a positive effect indicates an association of women and competence. As in the IAT, mean reaction time differences were divided by the overall standard deviation. As the attribute stimuli to which participants are supposed to react vary per GNAT task, Cronbach’s α was computed for the target stimuli only and found to be .63 in the men competence GNAT and .70 in the women competence GNAT. Since all factors regarding order of GNATs and GNAT tasks did not exert any substantial influence (all Fs < 1), they were not considered in the following analyses.

**Gender competence IAT.** As Figure 1 shows, the gender competence IAT replicated associations of own sex and competence, both for male, \( t(18) = 3.72, \eta_p^2 = .43 \), and female, \( t(63) = -5.38, \eta_p^2 = .31 \), participants, reflected in an effect of participant sex, \( t(81) = -5.92, \eta_p^2 = .30 \). No difference in own-sex competence associations between male and female participants was found, \( t(81) < 1 \).

**Gender competence GNATs.** As Figure 2 shows, stronger associations between own sex and competence were replicated with the GNATs. An ANOVA with type of GNAT as repeated measurement factor and participant sex as between-subjects factor revealed a significant interaction of participant sex and GNAT effect, \( F(1, 114) = 18.36, \eta_p^2 = .14 \). Men associated men more strongly than women with competence (simple main effect: \( F(1, 114) = 8.03, \eta_p^2 = .07 \)), and women associated women more strongly than men with competence (simple main effect: \( F(1, 114) = 11.27, \eta_p^2 = .09 \)). Moreover, we found associations of men and competence for both male, \( t(41) = 8.25, \eta_p^2 = .62 \), and female, \( t(73) = 9.38, \eta_p^2 = .55 \), participants. More interestingly, both female, \( t(73) = 11.16, \eta_p^2 = .63 \), and male, \( t(41) = 6.38, \eta_p^2 = .50 \), participants showed associations of women and competence.
2.7.3 Discussion

Study 2, using an additional measure of implicit cognition, replicated that both sex groups have stronger associations of competence and own sex compared to their associations of competence and opposite sex, pointing to ingroup enhancement as one relevant factor for explaining the present findings. Nonetheless, data also showed significant associations of men and competence for female participants, and, even more interestingly, significant associations of women and competence for male participants. The latter finding argues against the possibility that a traditional gender-competence stereotype was veiled by ingroup enhancement in Studies 1a and 1b. Instead, it points to a clear departure from traditional gender stereotypes with respect to the competence dimension.

2.8 Study 3

The aim of Study 3 was to approach the second dimension of gender stereotypes: warmth. Due to the fact that roles in warmth-associated domains are still predominantly held by women we expected to find women-warmth associations for both female and male participants. We tested this hypothesis with a gender warmth IAT. Also this time, attribute stimuli were evaluatively unbalanced, that is, the positive concept of warmth was contrasted with the negative concept of cold. Consequently, if self-favoritism was the driving factor (cf.
Rudman et al., 2001), we should find similarly strong associations of own group and warmth for both sex groups.

2.8.1 Method

2.8.1.1 Participants

All participants in Study 2 subsequently participated in Study 3.

2.8.1.2 Materials & Procedure

*Gender warmth IAT*. In one task of the gender warmth IAT, participants reacted to woman and warm with one response key, and to man and cold with another (henceforth, the congruent task). In the other task participants reacted to man and warm/woman and cold (henceforth, the incongruent task). Stimuli of the target dimension were chosen in analogy to those of the gender competence IAT used in the previous studies. Translations of the stimuli used for the attribute dimension are *warm* and *cold* for the attribute concepts, and *warm-hearted, lovingly, offish*, and *frigid* for the attribute stimuli. There were two congruent and two incongruent blocks with 40 trials each, stimuli were presented in random order, and practice blocks of 8 trials were included. Two practice blocks (a first in which participants reacted to attribute stimuli, and a second where they reacted to target stimuli) preceded the first task. In a third one, participants practiced reversed reacting to stimuli of the attribute concepts. The other procedural parameters of the gender-warmth IAT were the same as in the IATs used in Studies 1 and 2.

2.8.2 Results

In analogy to our previous IATs, a positive gender warmth IAT effect indicates an automatic association consistent with gender stereotypes (i.e., women and warm/men and cold; Cronbach’s $\alpha = .91$). As Figure 3 shows, we found an association of women and warmth across participants, $t(198) = 9.5$, $\eta^2_p = .31$. Women-warmth associations were significantly different from zero both for female, $t(137) = 12.32$, $\eta^2_p = .53$, and male, $t(60) = 1.67$, $\eta^2_p = .04$ (one-tailed) participants, and more pronounced for female participants, $t(197) = 3.98$, $\eta^2_p = .07$. 
Figure 3. Associations of women and warmth obtained by a gender warmth IAT (left part) and a semantic Response Window Priming measure (right part), for male versus female participants. A positive effect indicates an association of women and warmth. Error bars reflect standard errors.

2.8.3 Discussion

Facing the fact that warmth-related roles are still predominantly occupied by women in our society we postulated an association of women and warmth for both female and male participants. Indeed, we found a female-warmth association across participants that was more pronounced for females. Possibly, the two factors discussed above contributed to this finding: An underlying women-warmth stereotype might have caused the general association of women and warmth, a self-favorable mechanism might have led to a sex difference with females showing a stronger association of their ingroup and the positive trait warmth.

2.9 Study 4

Study 4 served for testing whether the findings obtained in Study 3 could be replicated by using an additional implicit measure. We developed a semantic Response Window Priming measure (Draine & Greenwald, 1998; Greenwald et al., 1996) for that purpose. In an RWP task, participants are instructed to react particularly fast within a very limited “response window”. Therefore, the number of errors sharply increases, and task difficulty is reflected in the error difference between trials with different primes. Thus, RWP might yield more reliable findings than regular priming tasks (cf. Wittenbrink, 2007). Stimuli representing men and women were used as primes and stimuli representing warmth as well as nonwords were used.
as targets. Furthermore, additional target dimensions were included for exploratory purposes. We expected lower error rates in detecting warm words as real words after women compared to men had been used as primes (thus indicating women-warmth associations).

2.9.1 Method

2.9.1.1 Participants

Participants were 177 students at a university in the east of Germany, 57% were female (age: \( M = 22, SD = 3 \)).

2.9.1.2 Materials

The primes used in the RWP task were women and men. The targets were warm, caring, and empathetic. The corresponding nonwords were pronounceable derivatives of the target words, modified to the extent that they could not be recognized as the original target words anymore. Next to the warmth dimension three further gender-stereotype related dimensions were included that might additionally be primed by our primes, namely: sexy, aggressive, and dominant. Corresponding to each stimulus of the additional target dimensions a nonword was created. The RWP comprised 4 blocks of 48 trials each. Order of stimuli was randomized in the first two blocks. Block 3 (Block 4) was identical with Block 1 (Block 2) with the difference that all female primes were replaced by male primes, and vice versa.

2.9.1.3 Procedure

Participants were led to an iMac in one cubicle. All instructions and tasks were presented and performed on the computer. After filling in demographic data, participants were informed that they should react as fast as possible to two different groups of words: real words and nonwords. Participants were instructed to react only to these two groups of words and to “ignore anything that flashes on the screen before an attribute appears” (i.e., the primes). Two response keys, marked with colored dots, should be used for reacting. Real words required a left reaction, nonwords a right reaction. The procedure was modelled after the affective priming procedure described by Musch (2000). The first five trials served to practice reacting to the gender stereotypic related adjectives and nonwords without a response window. During the following three trials, participants learned that they should react during the short time interval when the normally black target word was red, and that it would turn yellow in case they succeeded. These three trials demonstrated the interval duration, and no reactions were necessary. The prime was presented for 60 ms and there was a 10-ms interval
between prime and target. No effort to mask the prime was undertaken. The response window opened 330 ms after the target had appeared. The duration of the response window was 135 ms. After participants had reacted, the target remained on the screen for 500 ms. There was a 1-s interval between trials. In the course of the experiment the onset time of the response window was individually adjusted after each block, depending on average speed and accuracy in the preceding block. Given fast and correct responding, the response window was shortened, given slow incorrect responding, it was delayed (see Steffens et al., 2008, for details).

2.9.2 Results

Since no statistically significant results were obtained for the target dimensions sexy, aggressive and dominant (all $F$s < 3.47) only findings concerning the target dimension warmth are reported. Stronger associations of women and warmth compared to men and warmth should result in lower error rates in women-warm versus men-warm trials. The RWP effect was coded such that more positive values indicate a stronger association of women and warmth. In order to arrive at a measure of internal consistency of the RWP effect, we computed the RWP effect for each of the four blocks. This four-item scale possessed good internal consistency ($\alpha = .79$). Figure 3 shows the expected association of women and warmth across participants, $t(176) = 4.09, \eta^2_p = .09$. If analyzed separately, only women-warmth associations for female participants were significantly different from zero, $t(100) = 4.31, \eta^2_p = .16$, and not those for males, $t(75) < 1.18$, reflected in an effect of participant sex, $t(175) = 2.13, \eta^2_p = .03$.

2.9.3 Discussion

Using a semantic RWP task, we replicated the association of women and warmth across female and male participants. Different to the change in implicit gender-competence associations, no such change seems to take place with respect to the warmth dimension. This is in line with the idea that gender stereotypes correspond to gender roles: Since changes in gender roles can be predominantly observed in competence-related domains, it seems to be conclusive that the results reveal a departure from traditional gender stereotypes on the competence, but not on the warmth dimension.

2.10 General Discussion

Contemporary Western societies appear to be characterized by a change in the distribution of the sexes in the labor market, with an ever-growing proportion of women being
part of it. At the same time, no comparable change has been observed with regard to traditionally female tasks, for instance, parental ones, where the main burden still rests on women. Explicit gender stereotypes appear to mirror these changes (Diekman & Eagly, 2000; Diekman et al., 2005; Wilde & Diekman, 2005). The main aim of the present set of studies was testing contemporary implicit gender stereotypes by using different implicit measures, separating the competence from the warmth dimension. In Study 1a, using a heterogeneous sample of participants (men and women in leadership positions and students), a gender competence IAT revealed general associations of own sex and competence, for both male and female participants. This finding was replicated with a sample of a broader age range (Study 1b) and by using a further implicit measure, the GNAT (Study 2). Moreover, GNAT-findings revealed associations of men and competence also for female participants and, even more interestingly, of women and competence also for male participants. The GNAT findings are important out of several reasons. First, they demonstrate the generality of automatic own-sex-competence associations. Second, they shed further light on our IAT findings: Observing women-competence associations for male participants and a women-competence GNAT contradicts the idea that our IATs did not reveal a traditional gender-competence stereotype just because it was veiled by ingroup enhancement. It seems that next to self-favoring processes, which certainly constitute one important determinant for explaining our findings, traditional gender-competence associations have indeed given way to more balanced ascriptions of competence to men and women. Interestingly, Studies 1a and 1b (however not Study 2) revealed stronger associations of own sex and competence for male compared to female participants, which might reflect a still existing (though decreasing) majority of males in competence-associated roles in contemporary society.

A further mechanism that might have contributed to our gender competence IAT effects is social projection, a mechanism where the self-concept affects judgments about others (see Alicke, Dunning, & Krueger, 2005). Social projection appears to be moderated by social categorization: The positive relation between self and others judgments depends on whether the others represent an ingroup instead of an outgroup (Robbins & Krueger, 2005). In our case, women would ascribe competence to other women (their ingroup) because they judge themselves competent, and similarly for men. Along these lines, Rudman and colleagues (2001) showed that sex differences in gender stereotype IATs are related to people’s implicit self-concept such that the self and ingroup share desirable traits.

Two additional findings of Study 1a obtained in exploratory analyses deserve mention. For one thing, we found the strongest men-competence associations for the group of male
managers. This could be due to several causes: First, in line with social role theory (Eagly, 1987; Eagly et al., 2000) their daily exposure to a male-dominated business world could give rise to a particularly strong stereotype of men as being the competent sex. Second, according to social identity theory (Tajfel & Turner, 1986) high-status group members generally show stronger ingroup enhancement compared to low-status group members (cf. Sidanius & Pratto, 1999). Since male managers belong to a high-status group within the professional domain, they should exhibit pronounced ingroup enhancement, accordingly. Third, male managers should possess strong self-competence associations related to their prominent position within the occupational hierarchy, which might additionally bolster associations of own sex and competence via social projection (Alicke et al., 2005). Further clarifying these factors’ interplay should yield a deeper understanding of gender beliefs and should be addressed in future research.

Another interesting finding of Study 1a to be considered refers to equally strong associations of competence with women and men in case of the women’s representatives. Possibly, this group is characterized by chronic egalitarian goals which might have gradually led to equal perceptions of men and women on the automatic level (Moskowitz, Gollwitzer, Wasel, & Schaal, 1999).

In line with the observation that warmth-related roles are still predominantly occupied by women, Study 3 revealed automatic women-warmth associations both for female and male participants, although smaller in magnitude for males, using an IAT. Study 4 replicated women-warmth associations across participants, using a novel semantic Response Window Priming procedure. When considering female and male participants separately, the women-warmth association was significant only for females, which was reflected in a participant sex effect. Whereas it appears from this participant sex effect as if an ingroup enhancing mechanism was involved in implicit gender-warmth associations also, the pattern of findings for warmth is clearly different from that obtained for competence. In none of the gender-competence IAT replications did any of the groups of women tested show male-competence associations. However, with respect to warmth associations, an other-sex association was (descriptively) observed for male participants (for a more pronounced women-warmth association for male participants found with a gender warmth IAT, see Study 2 of Chapter 3). This pattern seems to contradict the findings of Rudman and colleagues (2001) who reported associations of own sex and warmth for female and male participants (Study 1). The authors showed that such sex differences in gender stereotypes were due to people’s tendency to ascribe positive traits to the ingroup. When they replaced their evaluatively unbalanced
attribute stimuli by such that were evaluatively balanced (e.g., mighty vs. gentle, instead of strong vs. weak, in a gender-potency IAT), general gender stereotypes could be restored. In our study, the stimuli representing the concept cold were not as negatively connotated as in Study 1 of Rudman and colleagues (where attributes such as cruel, selfish, and rude were used). That is, in our case approving a still existing women-warmth association appeared not to counteract a positive self-concept to the extent as it should have been for male participants in their work, thus possibly explaining the difference in findings. Still, our stimuli representing the concept cold were certainly more negative than those representing the concept warm, and despite of that, there was a general association of women and warmth. Thus, it seems that we did capture people’s underlying stereotypes, instead of primarily showing a process of self-favoritism.

Could it be that own-sex competence associations were fostered over own-sex warmth associations because competence is an inherently more positive feature? This is unlikely because trait ratings (Hager & Hasselhorn, 1994) show the converse, with the stimuli we used on the warmth dimension rated much more positively than those we used on the competence dimension. One factor might be that competence is assumed to be a self-profitable trait, whereas morality (which is conceptually close to warmth) is assumed to be an other-profitable trait (Wojciszke, 2005). Conceivably, self-profitable traits are just more prone to self-favoring processes. This would be an interesting aspect to be addressed by future research.

The pervasive association of women and competence that our female participants displayed is reassuring for every feminist who has secretly questioned, when reading the social cognition literature (e.g., Banaji et al., 1993), whether it could be that she, unknowingly, ascribes more competence to men than women. Our data clearly show that contemporarily for women, competence is not automatically male-associated (also see Steffens, Schult, & Ebert, 2009). Moreover, when assessing women-competence associations separately (i.e., not relative to men-competence associations), automatic women-competence associations for both women and men were found. These findings clearly indicate an absence of general men-competence/women-incompetence perceptions. Obtaining this pattern with implicit measures is all the more persuading because particularly implicit measurement tools seem to be adequate for unveiling underlying remains of sexist beliefs that might otherwise be concealed by correction processes.

An interesting secondary finding pertains to the fact that we did not observe task-order effects in any of the IATs. Task-order effects in IATs refer to the frequent finding of larger IAT effects when the attitude-congruent task is performed first. Ebert, Steffens, von
Stülpnagel, and Jelenec (2009) suggested that this effect is due to associative learning processes, which, similarly to evaluative conditioning (EC), should be caused by the spatio-temporal contiguity of an attitude object (e.g., the target concept women) and an affective stimulus (e.g., the attribute concept positive) within an IAT task. The authors showed that performing one IAT task led to changes in attitudes as subsequently measured by different implicit measures. The learning advantage of the first task was explained by proactive interference, suggesting that the learning of new information is impaired by the former learning of similar but different information (Schneider & Shiffrin, 1977; Underwood, 1957; also see Greenwald et al., 2003). An interesting and still open question refers to the generality of the findings with regard to stereotype IATs. As to our knowledge, evaluative conditioning procedures could not yet be successfully applied to semantic learning, suggesting that this learning principle is restricted to the learning of likes and dislikes. Considering the data presented in the current chapter, in none of our gender warmth and gender competence IATs, task-order effects emerged. This would argue for the hypothesis that semantic learning is not as easily triggered by basic associative learning principles as it holds for the learning of attitudes. Future research is needed which should address the systematic comparison between task-order effects within attitude and stereotype IATs. This could help to further clarify possible processes underlying IATs and might shed further light on the range and limits of associative learning processes.

The reported studies are also of interest when looking at the data from an intergroup perspective. As it has been numerously shown, high-status compared to low-status groups typically exhibit stronger ingroup favoritism (cf. Sidanius & Pratto, 1999). We found a departure from this general pattern, with the lower-status group of women showing strong associations of ingroup and the two positive dimensions under investigation, whereas for the higher-status group of men positive ascriptions to the ingroup were confined to only one of the two dimensions. This pattern is in line with research on gender attitudes, showing that women are perceived more positively than men, on the explicit (e.g., Eagly & Mladinic, 1989), as well as on the implicit level (e.g., Rudman & Goodwin, 2004). The following chapter addresses the generality and correlates of this so-called women-are-wonderful effect. Of particular interest will be the interplay between implicit gender-warmth/gender-competence associations (as studied in the current chapter) and the implicit preference for women.
3 Generality and Correlates of the Implicit Preference for Females

The following chapter focuses on the implicit women-are-wonderful effect. First, an overview on the study of gender attitudes will be given. Following, the research questions which guided the present work will be elucidated. Second, a series of studies will be presented, each followed by a brief discussion. Third, findings will be discussed in detail.

3.1 Attitudes towards Men and Women

When looking back at early work on gender attitudes and gender stereotypes one finds considerable consensus on a widely reported pattern of findings: Attitudes and beliefs about men were found to be more positive compared to attitudes and beliefs about women (Broverman, Broverman, Clarkson, Rosenkrantz, & Vogel, 1970; Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972; Goldberg, 1968; McKee & Sherriffs, 1957; Rosenkrantz, Vogel, Bee, Broverman, & Broverman, 1968). As suggested by Eagly and Mladinic (1989), these findings might in part reflect a much more pronounced discrimination of women prevalent in those days. For example, in 1957, McKee and Sherriffs found that not only attitudes, but also stereotypes about men were more favorable than those about women (both when administering a checklist technique and an open-ended elicitation procedure). However, when the original study was replicated in 1978 by Werner and LaRussa (1985), findings revealed that stereotypes about women had become more favorable and those about men less favorable during the intervening two decades. Additionally, the methodology of some of the early studies has been criticized as inadequate (see Ashmore, Del Boca, & Wohlers, 1986, for a review). For example, the research by Broverman and colleagues (1972; Broverman et al., 1970; Rosenkrantz et al., 1968) has been widely cited as evidence of more favorably male than female stereotypes. However, these authors had drawn their conclusions based on an attribute list that contained a larger number of stereotypic traits favoring men (so-called male-valued items) and a smaller number of stereotypic traits favoring women (so-called female-valued items). Hence, it is not surprising that their studies revealed male characteristics to be perceived positively more often. Accordingly, Widiger and Settle (1987) demonstrated that when using a balanced ratio of male- and female-valued items, no gender bias against women emerged. The most significant challenge of the early literature, however, was made by Eagly and Mladinic (1989; also see Eagly, Mladinic, & Otto, 1991) who examined attitudes and beliefs about men and women by choosing carefully constructed
methods (semantic attitude scales, a free-response measure of gender stereotypes, and gender-stereotype trait-rating scales), which circumvented some of the major shortcomings of previous research. In contrast to former findings, results showed that both female and male participants expressed more favorable attitudes and beliefs towards women than towards men. This effect was especially pronounced for female participants and particularly large for the so-called feminine-positive traits (which the authors had lent from the Extended Personal Attributes Questionnaire by Spence, Helmreich, & Holahan, 1979). More concretely, the most important source of women’s stronger favorability was participants’ tendency to ascribe communal qualities to females. These communal qualities comprised attributes such as helpful, warm, kind, and understanding, thus leading future researchers to refer to this finding as the women-are-wonderful effect.

One factor discussed by Eagly and Mladinic pertains to social desirability: The stronger favorability of females might have reflected participants’ monitoring of their responses to avoid appearing prejudiced against women. Certainly, people’s motivation to appear in a socially acceptable way presents a common difficulty when approaching socially delicate topics (such as gender issues) by using self-report measures (see 1.2.1). Thus, the employment of implicit measures should help to further understand the women-are-wonderful effect. More precisely, if the female preference was predominantly attributable to self-presentational pressures, it should substantially diminish when using implicit measures.

During the last decade, several studies have examined implicit gender attitudes (e.g., Carpenter, 2000; Nosek & Banaji, 2001; Richeson & Ambady, 2001; Rudman & Goodwin, 2004; Skowronski & Lawrence, 2001), most of them using Implicit Association Tests (IATs, Greenwald et al., 1998). Interestingly, the vast majority of these studies mirror Eagly and colleagues’ findings, that is, they revealed a consistent pattern of stronger implicit favorability of women as opposed to men. In a further analogy to explicit gender attitudes, the implicit preference for women was found to be particularly pronounced for female participants. With regard to male participants, a rather inconsistent pattern was observed, with men sometimes showing a comparably small preference for men (e.g., Nosek & Banaji, 2001), or for women (e.g., Carpenter, 2000).

The convergence in findings on explicit and implicit gender attitudes are highly surprising when looking at common findings on intergroup relations and intergroup attitudes revealing that typically high-status groups exhibit strong ingroup favoritism, whereas low-status groups exhibit less ingroup favoritism or even an outgroup preference (e.g., Rudman, Feinberg, & Fairchild, 2002; Sidanius & Pratto, 1999). System justification theory (Jost &
Banaji, 1994) explains this pattern of findings: Attitudes towards social groups justify hierarchies by casting dominants in a more positive light than subordinates, implying that the dominants deserve their privileged position. Thus, when considering research on status and intergroup attitudes, one would expect exactly the reversed pattern of gender attitudes: Women, who still constitute the lower-status group in Western societies, should show a smaller ingroup preference compared to men, who themselves, as the higher-status group, should reveal a relatively strong ingroup preference. So why do attitudes towards men and women depart from these regularities commonly applicable to intergroup relations? As Rudman and Goodwin (2004) pointed out, gender relations represent a special case of intergroup relations. Different from common ingroup-outgroup situations, men and women are in permanent and close contact with each other, their relations are characterized by mutual dependency, and the aspect of heterosexual relationships creates an exceptional psychological and physical intimacy between men and women. Rudman and Goodwin (2004) examined several potential correlates of the implicit female preference. They could show that only women, not men, possessed a balanced gender identity, revealing that men lack a mechanism that promotes implicit preference for one’s own group. Furthermore, they found pro-female bias to the extent that participants automatically favored their mothers over their fathers, or associated male as opposed to female gender with violence. And finally, for sexually experienced men, more implicit liking of sex corresponded to implicitly preferring females. Surprisingly, the authors did not find the expected link between an automatic gender stereotype describing women as warm and men as powerful on the one hand, and implicit gender attitudes on the other hand.

The research presented in this chapter aims at illuminating two central issues not fully understood by previous literature: first, the generality of the implicit female preference, and second, the relationship between implicit gender attitudes and implicit gender stereotypes.

3.2 Is the Implicit Preference for Females Generalizable to Different Methods of Measurement?

The vast majority of studies on implicit gender attitudes is based on IATs (e.g., Carpenter, 2000; Richeson & Ambady, 2001; Rudman & Goodwin, 2004). However, there is a series of confounding factors of IAT effects (for an overview, see Teige-Mocigemba et al., in press) that might also cause the asymmetric pattern of gender attitudes. For example, Rothermund and Wentura (2001; 2004) showed that salience asymmetries within the target and attribute categories can produce compatibility effects in IATs, also when evaluative
associations between the target and attribute dimension are eliminated. For example, using an old-young IAT with words versus nonwords as evaluatively neutral attribute concepts, the authors found faster reactions when old names and nonwords were assigned to one response key, and young names and neutral words to another one, than vice versa. This was explained by figure-ground compatibilities in the way that old names and nonwords can be grouped to an unfamiliar figure category which should pop out against a background of the more familiar categories of young names and neutral words. Interestingly, in a male-female visual search task which was used to assess salience asymmetries between the categories male and female, female participants showed longer response latencies for trials with male distractors, whereas for male participants, no differences in response latencies emerged between trials with female versus male distractors (Rothermund & Wentura, 2004). Because it is assumed to be more difficult to disengage attention from a stimulus of a salient category, longer reactions should follow when distractors of a salient category are used. Accordingly, findings imply that in a female-male context male stimuli constitute the figure for women, whereas female stimuli do not constitute the figure for men. Whatever the reasons might be, this could lead to the pattern in gender attitude IATs commonly observed: Female participants show faster reaction times when the figure categories men and negative require one response, and the ground categories women and positive require another response, leading to a women-positive/men-negative IAT effect, whereas for men, the concepts men and women apparently do not entail a figure-ground relation, thus leading to rather small or no effects in gender attitude IATs. Another confounding factor should be taken into account: Karpinski and Hilton (2001) suggested that IATs do not necessarily assess people’s personal evaluations but instead so-called “environmental” associations. Environmental associations refer to those associations a person has been exposed to in his or her environment, or, putting it differently, to culturally shared knowledge (also see Olson & Fazio, 2004). Coming back to the gender attitude IAT, it could be that a general positive attitude towards females rather reflects societal values suggesting equal rights and promotion of females than a personally endorsed preference of women. Finally, it was shown that IAT effects can be strategically controlled, especially when participants had performed at least one IAT before (Fiedler & Bluemke, 2005; Steffens, 2004), which is commonly the case when drawing on student samples. Furthermore, Czellar (2006) demonstrated that participants who were highly motivated to appear in a favorable light showed faking of an IAT. Thus, it could be that in studies using gender attitude IATs, participants (probably particularly men) endeavour not to appear sexist that should contribute to a general preference for females across participants. Facing these potential confounding
factors of IAT effects and the fact that most of the studies examining implicit gender attitudes have used IATs, it seemed appropriate to begin our research with a study where we tested whether the implicit preference for females is also observable with different implicit measures. In Study 1, we therefore assessed gender attitudes by administering Go/No-go Association Tasks (GNATs, Nosek & Banaji, 2001) and a Response Window Priming (RWP, Draine & Greenwald, 1998; Greenwald et al., 1996), next to an IAT. One of the rare studies investigating implicit gender attitudes by using an alternative measure (the GNAT) indeed showed an implicit preference for females over males (Nosek and Banaji, 2001). However, this finding must be dealt with caution: The stimuli representing the evaluative concepts good and bad confounded valence and gender stereotypic associations. Concretely, when observing a general female preference in a GNAT where attributes such as friendly, loving, and wonderful are used for representing the concept good, and attributes such as angry, brutal, and destroy are used for representing the concept bad, one cannot be sure, whether the “female preference” reflects a female preference or gender stereotypes or both (see Steffens & Plewe, 2001, for research demonstrating the impact of stereotypic associations on gender attitude IATs, and Rudman et al., 2001, for studies showing the impact of evaluative confounds in gender stereotype IATs). In addition, due to the methodological similarity of IATs and GNATs, the use of an additional implicit measure, priming, seemed to be meaningful.

3.3 Contemporary Gender Stereotypes and Gender Roles

The second goal of the current research was to examine the relationship between implicit gender attitudes and implicit gender stereotypes. According to the stereotype content model (Fiske et al., 2002), there are two fundamental dimensions of stereotypes applicable to a wide range of social groups, for example the two gender groups. Given the traditional distribution of women into the role of the homemaker and men into the role of the breadwinner, the model posits that women are perceived as warmer than men, whereas men are assumed to be perceived as more competent than women, or to put in other words, “the typical woman is seen as nice but incompetent, the typical man as competent but maybe not so nice” (Fiske, 1998, p. 377).

In a previous set of studies (see Chapter 2), we determined the contents of contemporary implicit gender stereotypes by choosing a multi-measure (IAT, GNAT, RWP), multi-group (participant samples varying in age and occupational background) approach. According to the stereotype content model, women-warmth and men-competence associations
were expected. In keeping with social role theory (Eagly, 1987), however, we expected a different pattern of findings. Social role theory assumes that gender stereotypic contents adjust to changes in gender roles. Such changes have been observed for competence-related roles, whereas warmth-related roles have remained relatively stable over time. More specifically, as stated by Shelton (1992), women have substantially increased their occupancy of the employee role (which is typically associated with competence), whereas men have not comparably increased their occupancy of the domestic role (which is typically associated with warmth, cf. Eagly & Steffen, 1984). A similar asymmetry can be observed within the occupational domain, in that men have not entered female-dominated occupations to the same extent as women have entered male-dominated occupations (England, 2003). Thus, based on contemporary gender roles, social role theory would predict a departure from the traditional men-competence stereotype, whereas the women-warmth stereotype should have remained relatively unaltered. Exactly this pattern of automatic gender stereotypes emerged: We found associations of women and warmth in female and male participants which is consistent with the still-existing overlap of women in warmth-related roles (German Federal Office of Statistics, 2006; Kuenzler, Walter, Reichart, & Pfister, 2001; Newport, 2008). However, in departure from the traditional men-competence/women-incompetence stereotype, both men and women automatically associated their own gender group with competence in a gender-competence IAT (for similar findings, see Richeson & Ambady, 2001). Even more interestingly, when gender-competence associations were assessed separately for each target sex by using Go/No-go Associations Tasks, it was found that both men and women are associated with competence by both female and male participants. This balanced pattern of gender-competence perceptions is coherent with women’s progressive participation in the paid labor force and an increasingly even distribution of competence-related roles among men and women (German Federal Office of Statistics, 2006; U.S. Department of Labor, 2005; see 2.4-2.9 for a detailed description of this research and 2.1-2.3 for a more extensive overview of contemporary gender stereotypes and gender roles).

### 3.4 Gender Stereotypes and Gender Roles: Do They Relate to the Female Preference?

In one of their studies, Rudman and Goodwin (2004) administered both a gender attitude IAT and a gender stereotype IAT, the latter tapping the dimensions of warmth and power. Unexpectedly, no relation between gender attitudes and gender stereotypes was found on the implicit level. However, a correlation of women-warmth associations and positive
attitudes towards females would have been conclusive for several reasons: First, as Eagly and Mladinic (1989) found, people favor women if they perceive women as warm and nice. This finding coheres with research on the stereotype content model and ambivalent sexism (Fiske et al., 2002; Glick & Fiske, 1996) predicting liking of those women who are seen as warm (but not competent outside the home). Second, Wojciszke (2005; also see Peeters, 1995) showed that morality (which is conceptually close to warmth) can be regarded as an other-profitable trait that primarily influences attitudes towards other persons, whereas competence can be regarded as a self-profitable trait that primarily influences attitudes towards the self. In short, previous findings imply that there should be a link between implicitly liking females and implicitly associating females with warmth. The reasons why this relationship was not found in the study by Rudman and Goodwin are not quite clear, however, one difficulty of interpreting their findings is one that is wide-spread in research using gender-stereotype IATs (cf. 2.4): Typically, these IATs simultaneously tap two dimensions of stereotypic contents (e.g., warmth and power). Consequently, when observing gender stereotypic associations, it cannot be disentangled whether females and males are stereotypically associated with warmth and power, or whether only one of these dimensions drives the overall IAT effect. In order to circumvent the simultaneous impact of two different stereotypic contents, also in the following set of studies, we used IATs that tapped stereotype dimensions separately. This was assumed to be a more appropriate way to examine possible attitude-stereotype relations (also see Rudman et al., 2001).

Based on the foregoing reasoning, we expected a positive correlation between automatic women-warmth associations and the implicit preference for females. This hypothesis was examined in Study 2. Study 3 was an extension of Study 2 serving to test whether the female preference might be tied to a certain female role, as suggested by former research. For example, Haddock and Zanna (1994) found more positive attitudes towards housewives compared to feminists. Similarly, ambivalent sexism proposes that subjectively positive attitudes towards women are constrained to those women who conform to the traditional role of women (Glick & Fiske, 1996), and, accordingly, the stereotype content model (Fiske et al., 2002) proposes that positive attitudes are typically directed to groups higher in warmth and lower in competence (e.g., housewives), whereas groups higher in competence and lower in warmth (e.g., feminists, cf. Eagly and Mladinic, 1989) are liked less. In order to examine whether implicit gender attitudes are linked to certain subgroups of females, in Study 3, two different roles of women were induced between subjects (i.e., the
role of the housewife versus the role of the career woman). Study 4 addressed the relationship between automatic gender-competence associations and implicit gender attitudes.

3.5 Women Are Wonderful, But Men Are Respected?

As our previous research (see Chapter 2) had shown, gender stereotypes concerning the competence dimension have become more balanced, that is, both men and women were found to be automatically associated with competence by both female and male participants. A subsequent question we raised was whether the increase in competence ascriptions to women might affect perceptions of respect. As former research consistently revealed, agentic competence corresponds to respect, whereas communal warmth corresponds to liking (Fiske et al., 2002; Wojciszke, 2005; cf. Rudman & Glick, 2008). Thus, in Study 5, we tested whether there are balanced ascriptions of respect to both gender groups, analogously to our findings on gender-competence associations. To examine this question, the general evaluative dimension of the gender attitude IAT was replaced by a dimension of respect (highly considered vs. inconsiderable). In the following section, our studies will be reported in detail, along with brief discussions of the findings obtained.

3.6 Study 1

In order to test whether the implicit female preference generalizes across different measures, in a first study, gender attitudes were assessed by GNATs and an RWP (Draine & Greenwald, 1998; Greenwald, Draine, & Abrams, 1996), next to an IAT (serving as a control condition).

3.6.1 Method

3.6.1.1 Participants

Participants were 187 students of a German university, 55% were female (age: $M = 22$, $SD = 3$). They were randomly assigned to one of three measures (IAT: $N = 66$; GNATs: $N = 58$; RWP: $N = 63$). Participants received course credit or candy for compensation.

3.6.1.2 Materials

IAT. Based on findings that IATs are sensitive not only to the implicit associations of the concepts that one intends to measure, but also to the associations of individual stimuli that are used for representing the concepts (e.g., Steffens et al., 2004), we avoided the use of connotative stimuli (such as first names) and instead applied only denotative stimuli (Steffens...
et al., 2008). The stimuli used for the gender attitude IAT were men and women, serving as target concepts, and man, male, woman, and female, serving as target stimuli. Positive and negative were used as attribute concepts, attribute stimuli were good, pleasant, bad, and unpleasant. There were three practice blocks consisting of four trials each: two at the beginning where participants practiced reacting to stimuli belonging to the target concepts (first practice block) and to the attribute concepts (second practice block), and a third one preceding the second combined task where the reversed reaction to stimuli of the target concepts was practiced. There were two congruent (women and positive, and men and negative, henceforth, women+/men–) and two incongruent blocks (men and positive, and women and negative, henceforth, men+/women–) of 64 trials each. Two response keys on the keyboard that should be used for reacting were marked with colored dots.

**GNATs.** The GNAT works according to the same principles as an IAT, with the difference that automatic associations are assessed with respect to a single target concept (e.g., men or women). As an example, participants react to women and positive in one task and to women and negative in another task, without including the target concept men at all (although this is also a possible option). That is, different to an IAT, in a GNAT, only one response key is needed (the space bar). If a stimulus, appearing in the middle of the screen, belongs to one of the two categories displayed on the top, participants are asked to press the space bar (“go response”). If the stimulus does not belong to any of the two categories, participants are asked not to react (“no-go response”).

Two different GNATs were administered, a GNAT assessing attitudes towards women (henceforth, the women-attitude GNAT), and a GNAT assessing attitudes towards men (henceforth, the men-attitude GNAT). Stimuli were the same as in the gender attitude IAT. Each GNAT consisted of two tasks (e.g., women and positive, henceforth, women+, vs. women and negative, henceforth, women–, in the women-attitude GNAT), each comprising two blocks of 48 trials each. Practice blocks, analogous to those used in the gender attitude IAT, of 4 trials each, were included. Stimuli were the same as those used in the IAT.

**RWP.** Stimuli were chosen according to those used in the IAT and the GNATs: Primes were women and men, targets were positive, good, and pleasant, versus negative, bad, and unpleasant. The RWP comprised 4 blocks of 48 trials each. Two response keys on the keyboard that should be used for reacting were marked with colored dots.

### 3.6.1.3 Procedure

Participants were randomly assigned to one of the three conditions of measurement
and led to separate cubicles. All programs (IAT, GNATs, RWP) were run on iBooks. Instructions and tasks were completely presented and performed on the computer. Before the study started, participants were asked for demographic data (sex and age).

**IAT.** Stimuli of the concept dimension (e.g., *male* and *female*) and the attribute dimension (e.g., *good* and *bad*), presented in random order, were shown in the middle of the computer screen and had to be assigned via key-pressing to the four super-ordinate concepts displayed in the upper left and right corner of the screen. Upon a key press, the stimulus disappeared, and 200 ms later, the next stimulus was shown. After an incorrect response, the letter “F” appeared. After each block a feedback was given informing participants on their mean error rate and mean reaction time. If the error rate exceeded 10% they were asked to react more slowly and more accurately in the following. Task order was counterbalanced.

**GNATs.** Stimuli were presented in random order and appeared in the middle of the screen. Every time a stimulus would appear that belonged to one of the two categories presented on the top, participants were asked to react by pressing the space bar; whenever a stimulus would not belong to the categories they were told not to react. The category labels (e.g., *women* and *positive* in the congruent task of the women-attitude GNAT) remained visible throughout each block. Each stimulus appeared in the middle of the computer screen 200 ms after the last response had been given. Participants had to react within 1000 ms, and reaction times were measured. Order of GNATs (women-attitude GNAT first vs. men-attitude GNAT first) was counterbalanced, and so was the order of GNAT tasks within both GNATs (e.g., women+ first vs. women– first within the women-attitude GNAT).

**RWP.** Participants were asked to react to the adjectives (i.e., the targets) presented in the following and to “ignore anything that flashes on the screen before an adjective appears” (i.e., the primes). Positive adjectives required pressing a right key, and negative adjectives required pressing a left key. Order of stimuli was randomized in the first two blocks. Block 3 (Block 4) was identical with Block 1 (Block 2) with the difference that all female primes were replaced by male primes, and vice versa. The procedure was modelled after the affective priming procedure described by Musch (2000). The first five trials served to practice reacting to the adjectives without a response window. During the following three trials, participants learned that they should react during the short time interval when the normally black target word was red, and that it would turn yellow in case they succeeded. These three trials demonstrated the interval duration, and no reactions were necessary. The prime was presented for 60 ms and there was a 10-ms interval between prime and target. No effort to mask the prime was undertaken. The response window opened 330 ms after the target had appeared.
The duration of the response window was 135 ms. After participants had reacted, the target remained on the screen for 500 ms. There was a 1-s interval between trials. In the course of the experiment, the onset time of the response window was individually adjusted after each block, depending on average speed and accuracy in the preceding block. Given fast and correct responding, the response window was shortened, given slow incorrect responding, it was delayed (see Steffens et al., 2008, for details).

### 3.6.2 Results

All analyses described in the following were conducted with $\alpha < .05$. As an indicator of the effect size, $\eta^2_p$ is reported (Cohen, 1977).

**IAT.** For all IAT studies reported in the present chapter an effect similar to the IAT D effect was computed (Greenwald et al., 2003). Specifically, no reaction times were excluded from analyses, and for each participant the difference between the mean reaction times in the congruent and the incongruent IAT task was divided by their overall standard deviation. There was no error penalty. All gender attitude IAT effects reported in the following were coded such that positive values indicate a stronger association of women and positive (and men and negative). The internal consistency of the IAT effect was Cronbach’s $\alpha = .95$ (cf. Steffens & Buchner, 2003). The left part of Figure 1 depicts IAT effects separately for female and male participants. As expected, we found an overall preference for women over men, $t(65) = 3.91, \eta^2_p = .19$. Also in line with previous findings, women showed a larger ingroup bias compared to men, $t(64) = 5.09, \eta^2_p = .29$ (females: $t(36) = 18.07, \eta^2_p = .9$; males: $t(28) = 2.75, \eta^2_p = .21$). Post-hoc analyses revealed an effect of task order, $t(63) = 9.98, \eta^2_p = .61$, with stronger pro-female IAT effects when the women+/men– task was performed first.

**GNATs.** Two GNAT effects were computed, a GNAT-men effect and a GNAT-women effect. As in the IAT, mean reaction time differences were divided by the overall standard deviation. Both GNAT effects were coded such that a positive effect would indicate a positive (compared to a negative) association with the respective sex group. Pearson correlations between GNAT$_{\text{even}}$ and GNAT$_{\text{od}}$ effects were $r = .70$ for the GNAT-men effect, and $r = .50$ for the GNAT-women effect, with the latter revealing a rather low reliability. In order to attain a relative measure comparable to the IAT effect, we computed a variable by subtracting the GNAT-men effect from the GNAT-women effect. Thus, positive values in this relative GNAT effect would indicate more preference for females compared to males. The middle of Figure 1 shows relative GNAT effects for male and female participants separately.
As can be seen, also with the GNATs an overall preference for women over men was obtained, $t(63) = 4.71, \eta_p^2 = .26$. Furthermore, women again showed a larger ingroup bias compared to men, $t(56) = 3.72, \eta_p^2 = .20$ (females: $t(36) = 6.63, \eta_p^2 = .55$; males: $t(20) < 1$).

**RWP.** A positive attitude towards a given concept (men or women) was inferred when its presentation would evoke less errors in subsequently reacting to positive compared to negative words. Again, we computed a relative RWP effect analogous to the IAT measure. For this purpose we subtracted error rates in the women-positive and men-negative trials from error rates in the women-negative and men-positive trials. Thus, a positive RWP effect would indicate an automatic preference for women over men. In order to arrive at a measure of internal consistency, we computed the RWP effect for each of the four blocks. This four-item scale possessed good internal consistency ($\alpha = .79$). The right part of Figure 1 displays relative RWP effects separately for male and female participants. Also with the RWP, we found an overall preference for women over men, $t(62) = 2.30, \eta_p^2 = .08$. Moreover, women again showed a larger ingroup bias compared to men, $t(61) = 2.55, \eta_p^2 = .10$ (females: $t(32) = 5.56, \eta_p^2 = .49$; males: $t(29) = 2.38, \eta_p^2 = .16$).

### 3.6.3 Discussion

In Study 1, we tested if the asymmetry in males’ and females’ implicit ingroup bias, which had been found in numerous IAT studies, is also obtainable when drawing on different
implicit measures. Two further measures of implicit cognition (GNATs and an RWP, next to an IAT) revealed the expected pattern of results: There was an overall preference for women and a larger ingroup bias for female compared to male participants, although with both the IAT and the RWP a significant ingroup bias was also found for male participants. That is, the implicit preference for women seems not to be specific to the IAT. Following this proof of generality, in a second step, we investigated the interplay of implicit gender attitudes and automatic gender-warmth perceptions.

3.7 Study 2

In Study 2, we examined the relationship between implicit gender attitudes and implicit associations of gender and warmth. For this purpose, we administered both a gender attitude IAT and a gender stereotype IAT tapping the dimension of warmth. Based on research on the stereotype content model (Fiske et al., 2002) and ambivalent sexism (Glick & Fiske, 1996), and studies showing that warmth is perceived as a desirable and other-relevant trait (Abele & Wojciszke, 2007), we expected a positive correlation between implicitly preferring women and implicitly associating women with warmth.

3.7.1 Method

3.7.1.1 Participants

Participants were 93 visitors of the open house at a university in the east of Germany. They were offered to take part in psychological studies that would reveal automatic cognitions, 66% were female. Their age ranged from 17 to 68 ($M = 29$, $SD = 12$).

3.7.1.2 Materials

Gender attitude IAT. Except for the following modifications the gender attitude IAT was the same as in Study 1: This time, we used a shorter version with each task comprising two blocks of 22 trials, and practice trials were omitted.

Gender warmth IAT. The gender warmth IAT was designed in accordance to the gender attitude IAT, but instead of the evaluative attribute concepts positive and negative the stereotypic concepts warm and cold were used. Attribute stimuli were warm-hearted and lovingly, versus distant and frigid. Number and length of the two tasks were chosen analogously to the gender attitude IAT of Study 2.

3.7.1.3 Procedure

Apart from the fact that participants performed two IATs, the procedure was the same
as in Study 1. There were four order conditions: The order of IATs (gender attitude IAT first or gender warmth IAT first) as well as task order within the first IAT was fully counterbalanced (that is, approximately 25% of the participants started with the women-warm/men-cold task, 25% with the men-warm/women-cold task, 25% with the women+/men– task, and 25% with the men+/women– task). When the gender attitude IAT had started with the women+/men– task (men+/women– task), the following gender warmth IAT also started with the women-warm/men-cold task (men-warm/women-cold task), and vice versa, thus resulting in four order conditions.

3.7.2 Results

Again, IAT effects were coded such that positive values indicate a preference for women (gender attitude IAT), and an association of women (as opposed to men) with warm (gender warmth IAT).

Gender attitude IAT. In line with previous findings, there was a general preference for women over men, $t(92) = 7.94, \eta^2_p = .41$, and a stronger ingroup bias for females than male participants, $t(91) = 6.76, \eta^2_p = .33$ (females: $M = .46, SE = .04, t(61) = 11.5, \eta^2_p = .68$; males: $M = .05, SE = .07, t(30) < 1$).

Gender warmth IAT. As expected, there was a general association of women with warmth, $t(92) = 9.63, \eta^2_p = .5$ (Figure 2). This effect was significant both for female, $t(61) = 11.58, \eta^2_p = .69$, and male participants, $t(30) = 2.74, \eta^2_p = .2$, although it was larger for females, $t(91) = 2.86, \eta^2_p = .2$.

Attitude-stereotype correlations. In order to check for a relationship between gender attitudes and gender-warmth associations, we first computed the correlation between the gender attitude IAT and the gender warmth IAT across all participants. This correlation turned out to be significantly positive, $r = .46$. That is, implicitly preferring females comes along with automatic women-warmth associations. When considering sex groups separately, we found this correlation both for female, $r = .26$, and male participants, $r = .51$. Although it was descriptively larger for male than female participants, the correlation between gender attitudes and gender-warmth associations was not moderated by participant sex, $F(1, 89) = 2.55, p = .11, R^2_{\text{change}} = .02$. Neither was it moderated by the order the two measures had been administered, $F(1, 89) = 1.78, p = .19, R^2_{\text{change}} = .02$. 
3.7.3 Discussion

The pattern of IAT effects obtained in Study 2 resembles that of previous studies: There was a general implicit preference for women over men, which was significant for female participants only, when considering both sex groups separately. Also consistent with the findings reported in Chapter 2, and in line with social role theory, an automatic women-warmth association was found. This was significant both for female and male participants, although it was more pronounced for females. Concerning the attitude-stereotype relationship, we found the expected positive relation between implicitly liking women and automatically associating women with warmth. This finding is in line with theories suggesting (subjectively) positive feelings and attitudes towards those women who still fill traditional female roles which are commonly associated with warmth (Fiske et al., 2002; Glick & Fiske, 1996).

Having provided preliminary evidence that the implicit women-are-wonderful effect relates to an implicit women-warmth stereotype, in a next step, we tested whether it is constrained to those female roles that are typically associated with warmth. More concretely, the traditional role of the female homemaker is commonly associated with warmth, kindness, and an orientation towards the concerns of others, as opposed to the more modern role of the career woman which is associated with goal-orientation, assertiveness, and an orientation
towards one’s self-concerns (cf. Eagly & Steffen, 1984). Accordingly, in Study 3, we manipulated the temporal representation of women by either inducing a traditional or a career or no female role (control condition) precedent to assessing implicit gender attitudes.

3.8 Study 3

In order to make certain images of women temporarily salient we used go/no-go detection tasks (cf. Rothermund & Wentura, 2004). There were two experimental conditions, one in which an image of a traditional woman and another one in which an image of a career woman was induced. In an additional (control) condition, no detection task was administered. Following the detection task, participants performed a gender attitude IAT. If the implicit preference for females is bound to subgroups of females that are stereotypically associated with warmth, for example housewives (Fiske et al., 2002), then the implicit preference should be more pronounced for those participants who were primed with an image of the housewife compared to participants who were primed with an image of the career woman, and participants of the control condition. Furthermore, based on previous research suggesting that those women who break from traditional gender roles are rather disliked (Carter, Lane, & Kite, 1991; Fiske et al., 2002; Glick & Fiske, 1996; Haddock & Zanna, 1994), we expected to find less implicit liking of females in the career compared to the control condition.

3.8.1 Method

3.8.1.1 Participants

Participants were 189 students of a German university, 59% were female (age: $M = 22$, $SD = 4$). They received course credit or candy for compensation.

3.8.1.2 Materials

Go/no-go detection tasks. Two different go/no-go detection tasks were administered between subjects, one where participants had to react to stimuli representing the categories woman and homemaker (traditional role condition), and another one where participants had to react to stimuli representing the categories woman and career woman (career role condition). Each detection task included two practice blocks of 6 trials. The first one served for practicing reacting to female stimuli. The second one served for practicing reacting to stimuli representing the traditional female role or the role of a career woman, respectively. The practice blocks were followed by a task that combined the two tasks practiced precedingly and consisted of 82 trials. As concept labels woman, homemaker, and career woman were
used. The concept woman was represented by the stimuli woman, women and female. Examples of stimuli representing the concept homemaker are wife, offspring, nurture, mothering, cooking, and care. Examples of stimuli representing the concept career woman are manager, boss, leadership role, independent, success, and top position. In German, there is a feminine and a masculine form for words like homemaker or manager. Feminine forms were used which should have further contributed to the induction of the required mental image. In a pilot-study, target stimuli had been pre-tested for their typicality for the given role. Only those judged as highly typical were included. Distractor stimuli were gender neutral stimuli on nature, like weather, wind, rainstorm, sky, and clearing. They had been pre-tested on gender neutrality (see the Appendix for the complete list of stimuli).

Gender attitude IAT. The same gender attitude IAT was used as in Study 1.

Manipulation Check. In order to provide a check for our imagery manipulation, participants of the experimental conditions were asked to write down their spontaneous associations with a couple of concepts, among them the critical concept women.

3.8.1.3 Procedure

Participants were randomly assigned to one of three conditions (traditional role vs. career role vs. control) and led to separate cubicles. The go/no-go detection tasks and the IAT were run on iBooks and all instructions for the computer-based part of the experiment were presented on the computer. Each detection task corresponded to a single GNAT-task used in Study 1. All procedural parameters were the same apart from the fact that there was only one block of 82 trials. Furthermore, this time, stimuli were presented in a constant random order across participants. Subsequent to the initial detection task participants performed a gender attitude IAT (which was identical to the one used in Study 1). After performing the IAT participants were asked to write down the first five associations that would spontaneously come to their mind when thinking of a couple of different concepts. Four of these concepts were used as distractors (e.g., beverage) and embedded the critical concept of women. Finally, demographic data (sex and age) were assessed.

3.8.2 Results

Manipulation check. At first, we compared participants’ spontaneous associations with the concept women in the traditional versus the career role condition. Associations were categorized as traditional or non-traditional (career-related) according to a previously defined guideline. A comparison of the average number of traditional associations between the two experimental conditions revealed a higher number for the traditional role compared to the
career role condition, $t(115) = -3.61, \eta^2_p = .1$. Analogously, a comparison of the average number of untraditional associations between the two experimental conditions revealed a higher number for the career role compared to the traditional role condition, $t(115) = 3.08, \eta^2_p = .08$. Thus, an activation of the required image of women could be shown even at the end of the experiment and should have therefore also been present throughout the preceding phase of attitude measurement.

**Gender attitude IAT.** As can be seen in Figure 3, there was a general implicit preference for women across the complete sample of participants, $t(188) = 10.48, \eta^2_p = .37$. A 2(participant sex) × 3(condition: tradition vs. career vs. control) ANOVA revealed a main effect of participant sex, $F(1, 183) = 95.08, \eta^2_p = .41$, with women ($M = .62, SE = .03$) showing a larger female preference compared to men ($M = .03, SE = .05$). Correspondingly, women again showed a stronger ingroup bias compared to men, $t(187) = 11.18, \eta^2_p = .4$. More interestingly, there was a main effect of condition, $F(1, 183) = 3.32, \eta^2_p = .04$. In order to test our specific hypotheses, we conducted polynomial contrasts comparing the three conditions. We expected to find a positive linear trend in that participants in the career condition would show least implicit liking of females, followed by the control condition which should again reveal less implicit liking of females compared to the tradition condition. Unexpectedly, we did not find this pattern of results, $F(1, 183) < 1$, instead a quadratic trend was observed, $F(1, 183) = 6.51, p < .05$, indicating that both participants of the tradition and career condition showed stronger implicit liking of females compared to the control condition. Post-hoc Tukey’s HSD tests showed that both of these differences were significant at the .05 level. The comparison between both experimental conditions was not significant. Furthermore, post-hoc analyses revealed an effect of task order, $t(187) = 5.61, \eta^2_p = .14$, with larger IAT effects when the women+/men– task was performed first.
3.8.3 Discussion

Interestingly, Study 3 revealed greater implicit liking of women both after inducing a traditional and a career image of females, compared to a control group where no imagery manipulation was used. This finding contradicts the idea that liking females is constrained to those women who conform to traditional female roles. Considering this unexpected pattern of findings, we would not only expect a relationship of automatically perceiving women as warm and implicitly liking them (Study 2), but also a relationship of automatically perceiving women as competent and implicit liking of females. This assumption was tested in Study 4.3

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3 Study 4 was originally planned as a replication and extension study of a work by Dasgupta and Asgari (2004). These authors found that exposing female participants to pictures and biographical descriptions of famous women in leadership roles resulted in less automatic stereotypic beliefs, as opposed to a control condition (where pictures and descriptions of flowers had been presented). Following up on this finding, we chose a similar procedure by additionally including a gender attitude IAT (N = 315 students, 51% female). This way, we wanted to test whether changes in automatic gender stereotypes might affect automatic gender attitudes. Unexpectedly, despite of thorough analyses, we did not find an effect of condition on automatic gender stereotypes, \( F(1, 310) < 1 \). However, there was an almost significant effect of condition on automatic gender attitudes, \( F(1, 310) = 3.55, p = .06, \eta^2_p = .01 \), with participants of the experimental condition (where pictures and biographical descriptions of German women in leadership positions had been presented) showing more positive implicit attitudes towards women. Although our manipulation did not temporarily strengthen automatic women-competence associations (which were significant for the complete sample, \( t(313) = 2.7, \eta^2_p = .02 \)), we wondered retrospectively if they might have affected women-agency associations. This question cannot be answered by the data, but it can be noticed that findings are in accordance with the current research indicating that the image of a modern and successful woman rather leads to more liking of females instead of less. Importantly, the correlation between both IATs reported in Study 4 was not moderated by condition, \( F(1, 310) < 1 \).
3.9 Study 4

In analogy to Study 2, participants performed both a gender competence IAT and a gender attitude IAT.

3.9.1 Method

3.9.1.1 Participants

Participants were 314 students of a large German university, 51% were female (age: $M = 23$, $SD = 4$). They received course credit or candy for compensation.

3.9.1.2 Materials

Gender attitude IAT. Except for the following modifications the gender attitude IAT was the same as in Study 1: This time, each IAT task consisted of one block comprising 70 trials, and no practice trials were included.

Gender competence IAT. The gender competence IAT was designed in accordance to the gender attitude IAT, but instead of the evaluative attribute concepts positive and negative the stereotypic concepts competent and incompetent were used. Attribute stimuli were competent and capable, versus incompetent and incapable. In line with the gender attitude IAT of this study, each IAT task consisted of one block comprising 70 trials and no practice trials were included.

3.9.1.3 Procedure

The procedure was the same as in Study 2. Analogously, there were four order conditions: Order of IATs (gender attitude IAT first or gender competence IAT first) as well as task order within the first IAT was fully counterbalanced (that is, approximately 25% of the participants started with the women-competent/men-incompetent task, 25% with the men-competent/women-incompetent task, 25% with the women+/men– task, and 25% with the men+/women– task). When the gender attitude IAT had started with the women+/men– task (men+/women– task), the following gender competence IAT also started with the women-competent/men-incompetent task (men-competent/women-incompetent task), and vice versa, thus resulting in four order conditions.

3.9.2 Results

IAT effects were coded such that positive values indicate a preference for women (gender attitude IAT) and an association of women (as opposed to men) with competent
Again, there was a general preference for women over men, $t(313) = 12.12, \eta^2_p = .32$, and a stronger ingroup bias for females than male participants, $t(312) = 14.85, \eta^2_p = .41$ (females: $M = .55, SE = .02, t(159) = 26.28, \eta^2_p = .81$; males: $M = -.03, SE = .03, t(153) < 1$).

**Gender competence IAT.** Interestingly, we found a general association of women with competence, $t(313) = 2.7, \eta^2_p = .02$. However, when analyzing the data of the sex groups separately, this effect was only observed for females, $t(159) = 11.67, \eta^2_p = .46$, for males there was an association of men with competence, $t(153) = -6.19, \eta^2_p = .2$ (Figure 2). A comparison of own-sex-competence associations revealed a more pronounced association of own sex and competence for female participants, $t(312) = -3.06, \eta^2_p = .03$.

**Attitude-stereotype correlations.** In order to check for a relationship between gender attitudes and gender-competence associations, we first computed the correlation between the gender attitude IAT and the gender competence IAT across all participants. This correlation turned out to be significantly positive, $r = .59$. That is, implicitly preferring females comes along with automatic women-competence associations. When considering sex groups separately, we found this correlation for both female, $r = .32$, and male participants, $r = .42$. Although it was descriptively larger for male than female participants, the correlation between gender attitudes and gender competence associations was not moderated by participant sex, $F(1, 310) < 1$. Nor was it moderated by the order the two measures had been administered, $F(1, 310) < 1$.

### 3.9.3 Discussion

Interestingly, we observed a positive correlation between implicitly liking females more than males and automatically associating females more strongly than males with competence. That is, an implicit preference for women not only corresponds to automatic associations of women and warmth but also to automatic associations of women and competence. This pattern of correlations is in line with Study 3 where both the induction of a (warmth-related) traditional image and a (competence-related) career image of women led to an increase in implicit liking of females compared to a control condition. Again, findings suggest that positive attitudes towards women are not confined to those females who are primarily associated with traditionally female attributes, such as warmth, but also to competent women who are entering the paid labor force and aiming at professional success. In spite of it all, women are still markedly underrepresented in high-status positions within the
upper level of occupational hierarchies. In a last study, we assessed implicit associations of
gender and a dimension of respect (highly considered vs. inconsiderable), instead of a general
evaluative dimension (positive vs. negative).

3.10 Study 5

We administered a gender respect IAT addressing people’s associations of gender and
respect. With this modified IAT, a departure from women’s general evaluative advantage was
expected: Findings should reveal more pronounced associations of men and respect, as
compared to women and respect.

3.10.1 Method

3.10.1.1 Participants

Participants were 54 students of a large German university, 52% were female (age: \( M = 22 \), \( SD = 3 \)). They received course credit or candy for compensation.

3.10.1.2 Materials

Gender respect IAT. We modified the gender attitude IAT used in the previous studies
by replacing the attribute concepts positive and negative by highly considered and
inconsiderable. As attribute stimuli honorable and considered versus unimportant and
insignificant were used. According to Study 1, there were three practice blocks with 8 trials
each. The combined tasks comprised two blocks of 40 trials each.

3.10.1.3 Procedure

The procedure was the same as in Study 1.

3.10.2 Results

IAT effects were coded such that positive values indicate stronger associations of men
and respect, opposed to women. The internal consistency of the IAT effect was Cronbach’s \( \alpha = .86 \) (cf. Steffens & Buchner, 2003).

Gender respect IAT. As can be seen in Figure 4, the general favorability of females
disappeared to the benefit of a descriptive association of male and respect, \( t(53) = 1.62, p = .11, \eta^2_P = .05 \). When analyzing the data of female and male participants separately, this effect
turned out to be significant for males, \( t(25) = 4.61, \eta^2_P = .46 \), whereas for females a
descriptive association of women and respect was observed, \( t(27) = 1.99, p = .06, \eta^2_P = .13 \).
The sex difference in associating own gender with respect was significant, \( t(52) = -2.1, \eta^2_P = \)
.08. Furthermore, there was a significant effect of task order during IAT, $t(52) = -4.11, \eta^2_p = .25$, with stronger associations of male and respect, when the men-highly considerable/women-inconsiderable task was performed first.

Figure 4: Effects in the gender respect IAT of Study 5, for male versus female participants. A positive effect indicates an association of men and respect, a negative effect indicates an association of women and respect. Error bars reflect standard errors.

### 3.10.3 Discussion

Tapping a dimension of respect instead of general evaluation, IAT findings revealed the expected departure from the general female preference in favor of a descriptive general association of male and respect. Considering gender groups separately, men showed a significant association of own sex and respect. That is, although nowadays women appear to be associated with competence similarly as men, they still seem to lack automatic ascriptions of respect. This is in line with women’s underrepresentation in professional top positions and worse (financial) appreciation of females’ efforts also when they are exactly identical to or even exceeding those of males.

### 3.11 General Discussion

Women are wonderful. This claim has been derived from innumerable studies on gender attitudes and gender stereotypes. However, although widely accepted, the effect has not yet been fully understood with regard to its correlates, range and limits. The studies presented in the current chapter aimed at shedding further light on some of the open
questions. First, we checked out whether the female preference generalizes across different implicit measures. Second, gender stereotypes and gender roles were examined as possible correlates of gender attitudes. Third, we tested if females’ evaluative advantage is also observable when replacing the general evaluative dimension of an IAT (positive vs. negative) by a dimension tapping respect (highly considered vs. inconsiderable). We chose an implicit approach because assessing personal conduct of gender-related issues is expected to be particularly prone to correction processes and to distortion based on inaccessibility.

In previous research, the implicit female preference was typically demonstrated with IATs. As explained earlier in this chapter (see 3.1), several confounding factors of IAT effects could also cause an evaluative advantage of women in gender attitude IATs. We thus raised the question whether the female preference is also observable when drawing on different implicit measures. In Study 1, two alternative implicit measures (GNATs and an RWP, next to an IAT) revealed the typical pattern of gender attitudes: There was an overall preference for women and a larger ingroup bias for female compared to male participants. That is, the implicit preference for women is not an artifact of the IAT. Following this proof of generality, Studies 2-4 examined the interplay of gender attitudes and gender stereotypes (Studies 2 and 4), and gender roles, respectively (Study 3). Study 2 revealed a positive correlation between an automatic women-warmth association and implicitly preferring females. This finding coheres with theories suggesting (subjectively) positive feelings and attitudes towards those women who still fill traditional female roles which are commonly associated with warmth (Fiske et al., 2002; Glick & Fiske, 1996). Study 3 examined if the implicit women-are-wonderful effect is constrained to those female roles that are typically associated with warmth. Surprisingly, the data revealed greater implicit liking of women both after inducing a traditional and a career image of females, compared to a control group where no imagery manipulation was used. This finding contradicts the idea that the female preference exclusively applies to those women who conform to traditional gender roles. Instead, it also seems to pertain to those who are entering the paid labor and aiming at professional success. Accordingly, Study 4 revealed a positive correlation between implicitly preferring females and an automatic women-competence association. That is, implicit liking of women does not only correspond to an automatic association of women and warmth but also to an automatic association of women and competence, suggesting that the women-are-wonderful effect has multiple roots, or, putting it differently, applies to different female subtypes. The results obtained in Studies 3 and 4 might be a consequence of the advancing gender equality in contemporary Western societies: Women who appear in competence-related roles have
become part of daily life and are no longer perceived as deviations from the norm which might otherwise cause negative reactions within the perceiver. At the same time, however, discrimination of women is unquestionably still an issue of the presence, for example, when considering females’ share of professional top positions, their (implicit) desirability as leaders (e.g., Eagly & Karau, 2002; Eagly, Makhijani, & Klonsky, 1992; Rudman & Kilianski, 2000), or still existing sex differences in salary. These considerations resulted in Study 5, where we assessed implicit associations of gender and a dimension of respect (highly considered vs. inconsiderable) with a gender respect IAT. This arrangement no longer revealed a female advantage in evaluation, instead data revealed a descriptive association of men and respect, which was significant for male participants. That is, although presently women are automatically associated with competence, they still seem to lack automatic ascriptions of respect compared to their male counterparts. This finding is in line with research demonstrating general implicit associations between men (as opposed to women) and careers (Nosek, Banaji, & Greenwald, 2002), power (Carpenter, 2000; Rudman et al., 2001), and authority (Rudman & Kilianski, 2000). Considering women’s position in today’s society, gender-respect associations in favor of men correspond to females’ underrepresentation in prestigious positions and to an averagely lower appreciation of their performance.

The surprise finding of the present chapter is that non-traditional representations of women do not correspond to reduced female liking. Instead, we found an increase in implicitly preferring females after an image of a career woman had been induced, compared to a control condition (Study 3), and a positive relation between implicitly liking women and automatically associating them with competence (Study 4). As stated above, these findings contradict former research implying that the women-are-wonderful effect particularly applies to those females who conform to traditional gender roles (e.g., Carpenter, 2000; Carter, Lane, & Kite, 1991; Eagly & Mladinic, 1989; Glick & Fiske, 1996; Haddock & Zanna, 1996). One possible explanation for the divergence of findings could be that the evaluation of non-traditional women has changed in recent years. As shown by Dasgupta and Asgari (2004), implicit gender stereotypes are malleable and change due to counter-stereotypic experiences. This was even found after a relatively short-time manipulation within a laboratory experiment. Considering a broader timeframe, women are expected to be ascribed increasing degrees of agency along with changes in gender roles (Diekman & Eagly, 2000; Eagly, 1987; also see Twenge, 1997, for analogous findings on actual sex differences in self-reported personality traits). If relatively short laboratory-based experiences are sufficient to evoke changes in implicit cognition (cf. Blair, 2002; Ebert et al., 2009), it is all the more expectable.
that such changes will result from longer-lasting real-life experiences (Greenwald & Banaji, 1995; Rudman, 2004): Conceivably, university students (who served as participants in Studies 3 and 4) are frequently exposed to generally positive experiences with counter-stereotypic females which not only should lead to an attenuation of traditional gender stereotypes but also to the establishment of positive attitudes towards modern females (or possibly to changes of a formerly less positive evaluation). In order to fully test this line of reasoning, further research is needed, meaningfully integrating other samples than students (e.g., older people).

Furthermore, it would be interesting to determine possible variables affecting implicit attitudes towards counter-stereotypic women (cf. Haddock & Zanna, 1996). Conceivably, as long as they do not strive for contesting men’s status, they are liked as much as females who fill more traditional roles. However, when women make a bid for power, positive attitudes might switch to disliking them (cf. Richeson & Ambady, 2001; Rudman & Kilianski, 2000). This reasoning also corresponds to the status incongruity hypothesis predicting that perceived violations of gender status expectations are the most likely source for backlash effects (Rudman, Phelan, Nauts, & Moss-Racusin, 2009).

Interestingly, our last study showed that when considering a dimension of respect instead of a generally evaluative dimension as it is commonly used in gender attitude IATs, the women-are-wonderful effect appears to switch to a men-are-valuable effect, thus hinting at the limits of the female preference: Although women of today are automatically associated with competence similarly to men, and in spite of the finding that women who break from traditional gender roles are not penalized with a decrease in liking, when considering a dimension of respect, one still finds a female disadvantage. Of course, future research is needed to corroborate this finding. For example, a study using gender respect GNATs could reveal how far women are perceived as considered or inconsiderable by men when regarded separately, thus providing an important extension of these findings. Does the pattern on gender-respect associations obtained in Study 5 contradict what was found in our previous studies? No, it makes sense that people of modern societies have developed a positive approach to females who appear competent and career-oriented, but this does not necessarily imply that women have completely caught up with men, yet. Rather more, these findings perfectly fall in line with several indicators of still existing discrimination against women (e.g., sex-related differences in wages). It remains to be seen how long it will take to extinguish these remnants of sexism and when this will finally result in a reflection on the implicit level. Another aspect which would be interesting to consider in future research refers to the relationship of implicit gender-respect associations and implicit gender attitudes. As
stated by Rudman and Glick (2008), the stereotypically “masculine” type achieves respect but sacrifices being liked, whereas the stereotypically “feminine” type elicits liking at the cost of being disrespected. Whether this pattern also pertains to the implicit level could be easily tested in a future study where both a gender-respect IAT and a gender attitude IAT would be administered.

Looking from a broader theoretical perspective, our findings provide support for the postulate that there is a link between attitudes and stereotypes. Facing a highly mixed pattern of findings, this issue has been debated controversially (for an overview, see Nesdale & Durkin, 1998). For example, Eagly and Mladinic (1989) found correlations between explicit gender attitude and gender stereotype measures, albeit smaller in magnitude than expected. Using implicit measures, Rudman and Goodwin (2004) found a relationship between liking females more than males and associating males (opposed to females) with threat. However, no relationship between implicit gender attitudes and gender stereotypes tapping the dimensions of warmth and power was found. Yet, following the present line of reasoning, there should have been a positive correlation between implicit gender stereotypes and implicitly preferring women because women-warmth associations are expected to correspond to positive evaluation. Strictly speaking, however, we cannot be sure if the observed gender stereotype in the Rudman and Goodwin study was driven by women-warmth associations. Although this is merely speculative, it is conceivable that their effect resulted from power-men associations solely, and these possibly do not correspond to gender attitudes. The latter consideration would be in line with a study by Carpenter (2000) who did not find a correlation between a gender attitude IAT and a strong-weak IAT.

At this point one might raise the question whether our correlational findings were alternatively driven by evaluative carry over effects. We argue against this explanation: First, in both Studies 2 and 4, we counterbalanced order of the two IATs. Carry over effects should have been particularly pronounced when the evaluative measure (gender attitude IAT) was performed first. However, the correlations between the two IATs were not moderated by the order they were administered. Still, one could object, that our stereotype IATs tapped evaluative associations based on the fact that our attribute concepts were evaluatively unbalanced, therefore carry over effects could have also occurred the other way around. This argument is particularly justified with respect to our competence data revealing self-favorable associations of own group and competence across participants (for a detailed consideration of this aspect, see the Final Discussion). However, there were significant differences between mean IAT effects (gender attitude vs. gender competence), which appeared for both sex
groups and both order conditions (attitude IAT first versus attitude IAT second) thus ruling out that the correlations were primarily driven by carry over effects.

Certainly, gender stereotypes constitute only one out of multiple factors that need to be considered in order to gain a profound understanding of the female preference. Another idea follows the reasoning that gender relations cannot be equated with common intergroup relations (Rudman & Glick, 2008; Rudman & Goodwin, 2004). For example, the aspect of heterosexual relationship is assumed to establish close intimacy and mutual dependency between men and women thus smudging group boundaries. We raise the question if these group boundaries become blurred especially for men. First, men, not women, crucially deviate from common intergroup patterns by showing no or only little ingroup favoritism, second, a series of findings (in part not published yet) provide preliminary evidence for this assumption. Stated in more detail, we suggest that (particularly young) men do not perceive women primarily as outgroup members. Instead they might be generally perceived as adorable and desirable and, possibly, even as a (potential) part belonging to the self (whereas other men might additionally be perceived as competitors in such a context). The following findings correspond to this consideration: First, Rudman and Goodwin (2004) showed that for sexually experienced males, implicit liking of sex was correlated with implicit liking of females. Ebert and Steffens (2009) found a related pattern revealing more implicit female liking for males who had seen erotic pictures of women beforehand, compared to a control group. Second, another study revealed sex as a moderator of the relationship between implicit ingroup bias and gender group identity (Ebert & Steffens, 2009). More concretely, the stronger males’ identification with the group of men, the stronger was their implicit liking of the “outgroup” (i.e., females) in a gender attitude IAT, whereas for females, a descriptive correlation was found in the opposite direction: More identification with the group of women led to more liking of the ingroup. This pattern is in line with a finding of Rudman and Goodwin (2004) using a gender attitude IAT and a gender identity IAT: There was a descriptively positive correlation between implicit ingroup bias and implicit gender identity for women, whereas the reversed relation was found for men. Maybe, it is part of the self-concept of highly male-identified men to like women and to perceive them as a substantial part of their selves, instead of members of an outgroup (at least as long as women do not challenge men for their power, as discussed before). Future research is needed to examine this preliminary line of reasoning. It will be of particular interest to see whether such a pattern also emerges for older age groups. Possibly, in older men, this mechanism disappears because intersexual attraction could be of minor importance. This might help to explain why we found a negative
correlation between implicitly preferring females and age in another study (Ebert & Steffens, 2009).

In conclusion, the present findings provide a deeper understanding of the implicit women-are-wonderful effect which appears to be related to both automatic women-warmth and automatic women-competence associations. The data suggest that the female preference corresponds to a generally more positive female than male stereotype with the former including both ascriptions of warmth and competence. However, when considering a dimension of respect, the women-are-wonderful effect appears to switch to a men-are-valuable effect. Findings are in line with indicators of women’s position in contemporary Western societies. In a final chapter, a number of issues will be addressed that are important to consider with regard to the present findings.
4 Final Discussion

Chapter 2 presented a series of findings on contemporary implicit gender stereotypes that precisely reflect what one would expect based on social role theory (Eagly, 1987; Eagly et al., 2000): In line with changes in competence-related roles, which are primarily accounted for by women’s increased participation in the paid labor force, we observed a departure from a general men-competence/women-incompetence stereotype. Instead, both sex groups showed associations of own sex and competence. Interestingly, when using Go/No-go Association Tasks (Nosek & Banaji, 2001) that allowed for disentangling the two concepts women and men, we also found men-competence associations for female participants, and, most interestingly, women-competence associations for male participants (next to own-sex competence associations). By contrast to the competence dimension, gender stereotypes respecting the second fundamental dimension of stereotypes, warmth, appeared unaltered, that is, there was an overall association of women and warmth which is in line with the still existing overlap of females in warmth-associated roles. Findings indicate that the changes in gender stereotypes predicted from changed gender roles also affect the automatic level of people’s belief systems, thus possibly pointing to an important extension of the scope of social role theory. However, this conclusion is of course preliminary in nature: The current work aimed at determining present implicit gender stereotypes respecting warmth and competence, and not at empirically corroborating an implicit role-stereotype relationship. For this purpose, implicit gender role perceptions would have to be assessed along with implicit gender stereotypes which would be a meaningful further step for future research. Findings of studies that already considered this question are rather mixed: Although a link between gender roles and gender stereotypes was numerous shown on the explicit level (Diekman & Eagly, 2000; Diekman et al., 2005; Wilde & Diekman, 2005), Rudman and Kilianski (2000) observed correlations between gender roles and gender stereotypes neither with explicit nor with implicit measures. Similarly, Richeson and Ambady (2001) did not find an influence of social roles on automatic gender competence associations. However, as social roles were established by assigning participants to situational roles for an upcoming task (superior, equal status, subordinate) in their study, it is quite conceivable that such an arbitrary and temporarily limited allocation of roles does not affect the implicit level. Taken together, more research is needed where the relationship between implicit gender roles and implicit gender stereotypes is systematically examined. In this context, determining the causal direction of this relationship is of particular interest: According to social role theory there should be an
effect of gender roles on the beliefs about men and women, however, the reciprocal causal link is conceivable as well (cf. Cejka & Eagly, 1999; Hoffman & Hurst, 1990).

A further issue related to our data deserves mention: Currently, there is an intense debate how far implicit stereotype measures assess semantic meaning (i.e., stereotypic contents) or basically the evaluative connotation of stereotypes. Rudman et al. (2001) showed that when using evaluatively unbalanced attribute stimuli in gender stereotype IATs (for example, positive attributes representing warmth, and negative attributes representing cold, in a gender warmth IAT, or positive attributes representing power, and negative attributes representing weakness, in a gender potency IAT), substantial sex differences emerged: In a gender warmth IAT, women showed a pronounced women-warmth association, whereas men revealed even a men-warmth association; in a gender potency IAT, men showed a pronounced men-power association, whereas women did not reveal an IAT effect. When attribute stimuli were matched in valence in a subsequent experiment, sex differences were dramatically reduced, with both sexes showing the expected gender stereotypic associations. In a further experiment, the authors could show that implicit gender-potency associations correspond to implicit self-potency associations such that self and ingroup share (for similar findings obtained with a priming procedure, see Wittenbrink, Judd, & Park, 1997, 2001). When looking at our data, some of the findings resemble the pattern observed by Rudman and colleagues. Specifically, implicit associations of own group and competence could be a reflection of people’s tendency to ascribe favorable attributes to one’s own group and unfavorable ones to the outgroup. However, considering our findings obtained with the gender warmth IATs, which were evaluatively unbalanced, too (though not as extremely as in Rudman et al.’s studies), the general association of women and warmth, which was (at least in some of the studies) significant for each sex group, argues against a mechanism driven by mere self-favorable processes. Also in Study 5, women, other than men, did not show a significant association of the favorable concept respect and own group. In addition, if the main driving factor in evaluatively unbalanced stereotype IATs actually was people’s tendency to ascribe positivity towards their own group, a pronounced women-potency association should have been found also for women in Study 1 by Rudman and colleagues (where evaluatively unbalanced stereotype IATs had been used). Finally, how far are self-favorable processes observed in common intergroup situations applicable to attitudes and beliefs on gender at all? Attitude measures (e.g., attitude IATs, GNATs, priming tasks) which should assess evaluation most purely do not show the common pattern of self-favoritism, instead they reveal strong own-group favorability for women, but not for men. Thus, should
one not expect more self-favorable stereotyping for females than for males? The opposite pattern was observed repeatedly: Rudman et al. (2001) obtained men-potency, and even more unexpectedly, men-warmth associations for male participants, but no gender-potency associations for females. In the current research, male participants showed pronounced associations of own gender with competence and respect whereas there was only a descriptive association of own sex and respect for females. Taken together, a mechanism driving people to associate positive traits with one’s ingroup certainly constitutes an important factor that has to be considered when assessing stereotypes. Nonetheless, self-favoritism appears not to be sufficient for explaining previous and the current data. Based on the considerations above, we argue that we did measure people’s gender stereotypic associations, however, it is highly conceivable that self-favorable processes exerted an additional influence. Meaningfully, future research should employ a measure tapping implicit gender-competence associations by using evaluatively balanced attribute concepts. This way, self-favoritism and gender-competence associations could be further disentangled. At this point, one might ask why we decided not to use evaluatively balanced stereotype IATs in the present research. Whereas it is meaningful to tease apart semantic from evaluative meaning in order to determine stereotypes that might otherwise be veiled by evaluative confounds, there are other issues where it appears to be suggestive to include the evaluative meaning of stereotypic contents. To give an example, Rudman and Ashmore (2007) found evaluative implicit race stereotypes to be better predictors of discriminatory behavior than attitudes. The present research focused on the interplay of evaluation and evaluatively relevant cognitive associations, thus, it was suggestive to include the evaluative connotations of stereotypic gender beliefs, in other words, this is what the present question is all about: How do general ascriptions of socially desirable traits, such as warmth, relate to the evaluation of a group to which this trait is stereotypically ascribed?

Capturing the central implications of the present research, it appears that people’s attitude to gender issues is in a state of flux, that their thinking opens up to societal changes towards more equality, and that their prejudices vanish in favor of a more positive approach towards those women who break from traditional gender roles. These developments are highly promising because they represent crucial preconditions for further progress of equality. As Marie-Josée Jacobs, Luxembourg’s Minister for Women, once put it: “Si l’on n’arrive pas à changer la façon de penser des gens, il sera difficile d’atteindre une véritable émancipation. Ainsi pour nous, le but le plus important est de changer les mentalités.” [“If there is no change in people’s thinking, it is difficult to achieve true equality. This is why a change in mentality
remains our most important goal.”] Of course, we have not fully reached this goal yet, but still, previous achievements clearly show that we are heading in the right direction. Last but not least, these achievements are due to women such as Angela Merkel, who jump over the scruples that people still raise when encountering self-assertive women. May every woman have the courage to rise up against and free herself from given constrictions, every one in her own way.
5 References


Spiegel Online (09/07/05). Angela Merkel realizes she's a woman. Retrieved August 25, 2009, [http://www.spiegel.de/international/0,1518,373540,00.html](http://www.spiegel.de/international/0,1518,373540,00.html)


Appendix

Appendix 1: Stimuli of the Go/No-go Detection Tasks of Study 3
(Chapter 3)

English translations in parantheses

**Stimuli representing the concept women**
Frau (woman)
Frauen (women)
weiblich (female)

**Stimuli representing the concept career woman**
Abteilungsleiterin (department manageress)
emanzipiert (emancipated)
entscheidungsbefugt (being in the authority to decide)
Erfolg (success)
Führungsposition (executive position)
Führungsrolle (leading role)
konkurrenzfähig (competitive)
Managerin (female form of manager)
Personalchefin (female form of personnel manager)
selbständig (independent)
Spitzenerfolg (outstanding success)
Spitzenposition (top position)
stark (powerful)
Teamleiterin (female form of team leader)

**Stimuli representing the concept homemaker**
bemutternd (mothering)
Ehepartnerin (spouse)
Erziehung (rearing)
Fürsorge (care)
häuslich (homely)
Hausarbeiten (chores)
Hausfrau (female form of homemaker)
Haushalt (household)
Heim (home)
Kinder (children)
Kochen (cooking)
mütterlich (maternal)
Mutter (mother)
Nachwuchs (offspring)

**Distractors**
Bienenstock (beehive)
Braunkohle (brown coal)
Feldspat (feldspar)
Frosch (frog)
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<tr>
<td>Gebirgszug</td>
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<td>Himmel</td>
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<td>Lichtung</td>
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<td>Schafherde</td>
<td>(flock of sheep)</td>
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<td>Wind</td>
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<td>Witterung</td>
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Summary of Findings

Starting point of the present research was the well-known finding that females are preferred to males on a general evaluative dimension. This so-called *women-are-wonderful* effect has not yet been fully understood with regard to its correlates, range and limits. We chose a two-stage procedure in order to shed further light on some of the open questions. Because assessing personal conduct of gender-related issues is expected to be particularly prone to correction processes and to distortion based on inaccessibility implicit measures were used.

In a first stage (see Chapter 2), we concerned with the attributes that are typically ascribed to the groups of interest (i.e., gender stereotypes). We regarded this a meaningful first step because knowing which attributes people spontaneously associate with men and women could help to understand why one group is preferred to the other. More concretely, we focused on the stereotypic dimensions of *warmth* and *competence* which are assumed to constitute the fundamental dimensions of intergroup perception (see *stereotype content model* by Fiske et al., 2002). Given the traditional distribution of women into the role of the homemaker and men into the role of the breadwinner, the model predicts women to be warmer than men, and men to be more competent than women. According to *social role theory* (Eagly, 1987; Eagly et al., 2000) such gender stereotypic contents emerge from the distribution of women and men into certain social roles and should adapt to changes of these roles. A change in gender roles can presently be observed in the way that women, next to their responsibility of domestic duties, increasingly take part in the labor force (i.e., competence-related roles), whereas an equivalent increase in men taking over the role of the homemaker or other warmth-related roles (such as kindergarten teacher or nurse), cannot be recorded. A series of studies revealed contemporary gender stereotypes that precisely correspond to this current pattern of gender-role allocation: Different implicit measures revealed that men and women are associated with competence, whereas a women-warmth stereotype remains.

In a second stage (see Chapter 3), we examined different aspects of gender attitudes, among them the interplay of gender attitudes and gender stereotypes. A first study served for ruling out that the implicit preference is an artifact of measurement method. In a subsequent study a positive correlation between women-warmth associations and preferring females was obtained. This finding coheres with theories suggesting (subjectively) positive feelings and attitudes towards those women who still fill traditional female roles which are commonly associated with warmth (Fiske et al., 2002; Glick & Fiske, 1996). In a further study, we
examined if the implicit women-are-wonderful effect is constrained to those female roles that are typically associated with warmth (i.e., traditional female roles). Surprisingly, data indicate that the female preference also applies to women who break from traditional gender roles. Accordingly, a next study revealed a positive correlation between preferring females and women-competence associations. In a final study, it was shown that the women-are-wonderful effect appears to switch to a men-are-valuable effect when a dimension of respect (as opposed to one of general evaluation) is considered. Findings are in line with an advancing, though not yet completed, gender equality in Western societies.

In a final discussion (see Chapter 4), a number of issues are addressed that are important to consider with regard to the present findings. One example refers to the question whether evaluatively unbalanced stereotype IATs rather capture self-favorability processes instead of stereotypic associations (Rudman et al., 2001), and how far this might affect the interpretation of the current findings.
Zusammenfassung


In einer zweiten Phase (siehe Kapitel 3) untersuchten wir verschiedene Aspekte von Geschlechtereinstellungen, unter anderem das Zusammenspiel von Geschlechtereinstellungen

In einer abschließenden Diskussion (siehe Kapitel 4) werden eine Reihe von grundlegenden Diskussionspunkten berücksichtigt, welche relevant für die vorliegende Forschung erscheinen. Ein Beispiel hierfür ist die Frage, inwiefern evaluativ unausgeglichene Stereotyp-IATs selbst-begünstigende Prozesse anstatt stereotyper Assoziationen abbilden (Rudman et al., 2001), und inwieweit dies von Bedeutung für die Interpretation der vorgestellten Befunde ist.
# Lebenslauf

**Irena D. Ebert**

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Geburtstag: 29.03.1978  
Geburtsort: Schwäbisch Hall  
Familienstand: ledig  
Nationalität: deutsch

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Jena, den 03.09.2009
Ehrenwörtliche Erklärung

Hiermit erkläre ich, dass mir die Promotionsordnung der Fakultät für Sozial- und Verhaltenswissenschaften an der Friedrich-Schiller-Universität Jena bekannt ist.


Ich habe weder die Hilfe eines Promotionsberaters in Anspruch genommen, noch haben Dritte unmittelbar oder mittelbare geldwerte Leistungen von mir für Arbeiten erhalten, die im Zusammenhang mit dem Inhalt der Dissertation stehen.

Die Arbeit wurde weder im In- noch im Ausland in gleicher oder ähnlicher Form einer anderen Prüfungsbehörde vorgelegt. Ich habe weder früher noch gegenwärtig an einer anderen Hochschule eine Dissertation eingereicht.

Ich versichere, dass ich nach bestem Wissen und Gewissen die Wahrheit gesagt habe und nichts verschwiegen habe.

Jena, den 03.09.2009

(Irena Ebert)