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# Warmth and competence in implicit stereotypes and discrimination



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To Lovisa



# Abstract

It is well established that we do not judge other people on a one-dimensional scale (i.e., good - bad), but rather based on two fundamental dimensions. The first dimension is warmth, which essentially answers the questions of what the other person's intentions are (e.g., friendly or malicious). The second dimension is competence, which in contrast answers the question regarding the person's capability to carry out those intentions. The stereotype content model (SCM; Fiske, Cuddy, Glick & Xu, 2002) suggests that these two dimensions are not only relevant for person-perception, but also for intergroup bias. Some groups are stereotyped as both warm and competent (e.g., the majority population or the ingroup) or neither warm or competent (e.g., an ethnic minority). Some groups have mixed stereotypes: warm, but not competent (e.g., Greeks), or competent but not warm (e.g. Germans).

There is already considerable research supporting the SCM. Yet, these studies have so far focused almost exclusively on self-reported stereotypes and prejudice. The present thesis aimed to extend this research by focusing on two unexplored areas where a warmth and competence perspective might prove useful: implicit stereotypes and discrimination.

**Study I** showed that it is possible to capture mixed stereotypes (in terms of warmth and competence) using the Implicit Association Test (Greenwald, McGhee & Schwartz, 1998). The study also provides some preliminary indication of the usefulness of this approach. Specifically, whereas the implicit measures were sensitive to ingroup bias, the explicit measures were not.

**Study II** demonstrated that mixed stereotypes translate into mixed discrimination. Across two experiments, groups that are stereotyped as warm but not competent (preschool teachers and Greeks) were discriminated in a competence paradigm, but favored in an empathy (warmth) paradigm. In contrast, groups who are stereotyped as cold but competent (lawyers, Germans) were favored in the competence paradigm, but discriminated in the empathy paradigm. Importantly, a one-dimensional perspective failed to find any indication of discrimination, since the groups were treated equally if the two dimensions were collapsed.

**Study III** investigated real-life hiring discrimination in a field experiment. Fictive applications were sent to 5,636 job openings. By experimentally varying whether the applicant had an Arab or Swedish sounding male name, and whether he or appeared warm and/or competent in the personal letter, we were able to investigate how individuating information related to warmth and competence interacts with



ethnic hiring discrimination. We found substantial discrimination in that Arab applicants received fewer invitations to job interviews. Consistent with the stereotype content of Arabs, an applicant with an Arab sounding name had to appear both warm and competent in order to increase his chances. Interestingly, in order to be on (almost) equal terms as an applicant with a Swedish sounding name, he had to be both warmer and more competent.

In conclusion, the present thesis suggest that much is to be gained from viewing intergroup bias from a two-dimensional perspective, regardless if the focus is on implicit stereotypes or on discrimination. Researchers into implicit stereotypes who do not consider warmth and competence may haphazardly conclude that a group is either negatively or positively stereotyped, when the implicit stereotype is actually mixed (e.g., warm but not competent). The same is true for discrimination, which can also be mixed in terms of warmth and competence. Furthermore, even when studying discrimination toward groups that are clearly stereotyped as altogether bad, a one-dimensional perspective may still lack precision. Indeed, it was not enough for an applicant with an Arab sounding name to appear warm *or* competent: he had to appear simultaneously warm and competent if he were to increase his chances to receive job interviews. Hence, it would appear that intergroup bias is a too complex phenomenon to be understood as simply good or bad.

# List of papers

The present thesis is based on the following papers, which I will refer to by their roman numbers.

- I: Carlsson, R., & Björklund, F. (2010). Implicit stereotype content: Mixed stereotypes can be measured with the implicit association test. *Social Psychology*, 41(4), 213-222. doi:10.1027/1864-9335/a000029 \*
- II. Carlsson, R., Björklund, F., & Bäckström, M. (2012). Mixed discriminatory judgments of individuals' warmth and competence-related abilities. *Social Psychology*, 43(3), 160-167. doi:10.1027/1864-9335/a000094 \*\*
- III. Agerström, J., Björklund, F., Carlsson, R., & Rooth, D.-O. (2012). Warm and competent Hassan = cold and incompetent Eric: A harsh equation of real-life hiring discrimination. *Basic and Applied Social Psychology*, 34(4), 359-366. doi:10.1080/01973533.2012.693438 \*\*\*

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# Acknowledgments

When I first applied for university studies, I had three different dream careers in mind: researcher, author and teacher. I did not think I had any shot at the first two, and thus I enrolled in a teacher-training program. I remember clearly the day when I came to realize that a researcher career was not unattainable. My psych. teacher (Jens Agerström) had contacted me and quite persuasively convinced me to start working as a research assistant with him in an Economics/Psychology project on discrimination, lead by Dan-Olof (Danne) Rooth. I remember feeling that I was in way over my head: with 60 credits in Psychology and absolutely zero in Economics, what use would I be in a research project? But then Danne explained to me that anyone can do research, regardless of level of education, title or background; what matters is the contribution you actually make. He kept true to his word. While working in this project, I always felt that I was evaluated to the same standard as everyone else. I did not get away with poor work because of my lack of education and experience, but in return good work was never belittled. It was a research environment where ideas were cherished when they were good, and crushed when they were, well, not so good, regardless of whose ideas they were. I learned a great deal in this research project, and I cannot imagine a better place to start your career as a researcher. I will always be grateful to Jens and Danne for giving me this opportunity.

I have kept working with Jens and Danne even after I started my PhD studies. For example, they are both coauthors of Study III. However, the people who have been most involved in my PhD studies are, of course, my supervisors Fredrik Björklund and Martin Bäckström. They gave me precisely the type of tuition I wanted: high level of independence combined with swift help whenever I needed it. I sometimes refer to Fredrik as “Lucky Luke”, because he outdraws his own shadow when answering the phone. Typically, he will then, on the top of his head, cite some classical study that has already solved (most likely before I was born) the question I called him about. Martin on the other hand has always had a very keen eye on how complex problems can more easily be understood as simpler problems. Also, there are few other people who seem to enjoy discussing statistical analysis with me. Together, Fredrik and Martin have been of great help in completing this thesis.

There is one more person who has played a very important role in completing this thesis. A person who I believe is simply too modest to realize that himself. That person is Magnus Carlsson. Without him, Study III would literally not have been conducted, since he (together with Danne) is behind the large project that Study III was part of. He has also always been a great source of advice whenever I have needed a

fresh perspective, or have had specific questions about research in economics. Or about programming. Or about statistics. Or when my (not his!) friends wanted a tour of his newly built house to decide if they wanted to build a similar house of their own. Yet, Magnus has never once asked anything in return. I am unsure about whether to attribute this to my lack of competence, or his excess of warmth, but I do hope that I one day will be able to return some of the favors.

I doubt that there are any PhD students who never procrastinate. Thankfully, I have been able to fill this procrastination with exciting research that Jens and Samantha has invited me to work on. Working on these projects has been a lot of fun, but it has also been an important part of keeping me motivated to continue working on my thesis.

I would also like to thank all the colleagues, teachers, administrative staff and students who have all contributed in making my time as a PhD student a worthwhile and enjoyable experience.

In the end, I became a researcher and a teacher. Well, technically, I am also an author. What is more important though, is that I am now also a husband and a father. Erica, you have always stood by me and I know you would have supported whatever silly dream I would have pursued. You have always reminded me that “it is only a job”, and although I have not always been glad to hear it, it has always been an important truth. After all, research *is* only a job. A job that pales in comparison with you giving birth to and taking care of Lovisa. For me, that is the very definition of high warmth and competence.

# Introduction

Imagine you are to be stranded on a deserted island with a stranger. Describe with two words what type of person you would like that person to be. I am willing to bet that you picked one characteristic from the warmth dimension: perhaps the person is kind, honest, or nice. I am also willing to bet that you picked one characteristic from the competence dimension: the person would likely be competent, capable or smart. Indeed, it would be quite hard to pick any two relevant characteristics that do not fit into either one of these two dimensions. And it would be foolish not to choose one from each dimension: a nice and honest person who is incapable when it comes to survival is not a good companion on a deserted island. Neither is the fictive serial killer Hannibal Lecter, whom you might have ended up with if you chose a smart and capable person while ignoring warmth altogether.

I hope that this little exercise has demonstrated that warmth and competence are two fundamental dimensions of social judgments. Had you continued to list characteristics, chances are that almost all of them would end up in either warmth or competence; indeed a considerable amount of research suggests that most social judgments do (e.g., Judd, James-Hawkins, Yzerbyt & Kashima, 2005; Fiske, Cuddy & Glick, 2007; Wojciszke, Bazinska & Jaworski, 1998). Of course, you could always make a more detailed categorization by applying for example a BIG FIVE framework (Costa & McCrae, 1992). Still, the two dimensions warmth and competence can be used as rough, but useful, descriptions of other people that you are going to interact with.

It has been argued that these two dimensions have an evolutionary basis (Fiske et al., 2007). The argument is that people who were skilled in assessing these dimensions survived to a higher extent because it enabled them to quickly identify potential threats as well as allies. Persons who are both warm and competent are the persons we want to surround us with. Those who are warm but not so competent may still be good company, but they might not contribute as much, and could potentially even be a burden if resources are scarce. Let us consider a typical evolutionary relevant example: who to bring on a hunt. Bringing a non-skilled hunter along might result in less game than if one went hunting by oneself. On the other hand, a skilled hunter that is not very warm might not share the food in a just way, perhaps claiming the best meat parts for him- or herself. It goes without saying that a person that is neither warm nor competent is a really poor choice: little help in hunting and still trying to claim the best parts! Clearly, we would want a warm and competent person, who is both a good help in hunting and fair when dividing the

meat. Yet, one will also quickly realize that the warmth of others will, in most cases, be more important than competence. A consistent finding is that warmth is the bigger of these “big two” of social judgments (e.g., Abele & Bruckmüller, 2011; Wojciszke et al., 1998). However, this largely depends on the relation to one-self (Abele & Wojciszke, 2007). If one’s goals happen to coincide, then competence to achieve them will be more important than the other person’s warmth. Returning to the introduction example of who to bring to a deserted island, the choice between the highly intelligent serial killer and the friendly but incapable fool, is actually not an easy one. Assuming that both you and the serial killer wants to survive and escape the island, your goals may happen to coincide to such a high extent that his low warmth is less important than his high competence.

The two fundamental dimensions warmth and competence are not news in the study of social perception and judgment. On the contrary, they have been used, although in somewhat different conceptualizations and with different labels, for many years. They can be traced back to the pioneering study of impression formation by Asch (1946), where the importance of warmth became apparent. This work was refined by Rosenberg, Nelson and Vivekananthan (1968) who showed that person perception could be described in terms of two dimensions, at the time called good/bad-social and good/bad-intellectual: a framework highly similar to what is used today (e.g., Judd et al., 2005). Other names for these dimensions include communion instead of warmth, and agency instead of competence (e.g., Abele & Wojciszke, 2007; Wojciszke & Abele, 2008), as well as morality instead of warmth (Wojciszke et al., 1998). It should be noted that different conceptualizations have slightly different focus, for example agency focusing more on active action-oriented aspects of competence (e.g., assertiveness), and good-social focusing more on social (e.g., friendly) traits than a morality (e.g., fair) centered dimension. To some extent different terminologies have been used in different areas, with warmth and competence being used more in relation to others, and agency vs. communion with relation to one-self (Abele & Wojciszke, 2007). Despite these slightly different focuses, the underlying dimensions are essentially the same (Fiske et al., 2007; Wojciszke & Abele, 2008) and most researchers agree that warmth (communion, morality) deals with people’s social functions, while competence (or agency) deals with peoples’ abilities to achieve their goals. For ease of reading and consistency, the terms used throughout this thesis are warmth and competence.

Although conceptualized as two different dimensions, it is important to note that warmth and competence are not entirely orthogonal. If one dimension is increased then this is likely to affect the other. Specifically, if a person that was an unimportant rival starts to become more competent, the he or she becomes much more important rival. Hence, increased competence tends to lead to decreases in perceived warmth. Similar, if one of your friends starts acting mean, it becomes more relevant to realize if he or she is a force to be reckoned with and thus competence ratings tend to increase. Or as Kervyn, Judd and Yzerbyt (2009) state in the title of

their article about this compensation effect: *You want to appear competent? Be mean! You want to appear sociable? Be lazy!*

The usefulness of a two-dimensional (warmth and competence) approach becomes clear when compared to a one-dimensional approach, such as a good-or bad driven perspective on social perception. By definition, a two dimensional system has the potential to be more detailed than a one-dimensional. For example, a one-dimensional approach cannot distinguish between the skilled hunter that refuses to share the food from the kind person who accidentally steps on a dry twig and scares a way the deer your arrow was being pointed toward. Indeed, both are bad, but in different ways. Furthermore, if we assume that warmth and competence are given equal weights in a one-dimensional perspective (e.g., a computed average) a one-dimensional perspective would not distinguish between a person with average scores on both warmth and competence (the average Joe) and a person who is extremely cold but extremely competent (a criminal mastermind). Indeed, both might end up with an average level one-dimensional score.

Despite the obvious benefits of a two-dimensional approach, it is a one-dimensional perspective in the form of the attitude concept that has come to dominate in many areas of social psychology. Attitudes are one-dimensional verdicts of whether something is good or bad. Of course, they may be quite complex and have different components (e.g., both beliefs and evaluation), but in the end it boils down to a one-dimensional favorable, or unfavorable, disposition towards an object (see Greenwald & Banaji, 1995 for a review). One needs only to open an introductory text to social psychology to realize how central this concept is in social psychology. This is true for such widely different areas as consumer behavior (e.g., Maison, Greenwald & Bruin, 2004), politics (e.g., Galdi, Arcuri & Gawronski, 2008) and intergroup bias (e.g., Nosek et al., 2007). Furthermore, the one-dimensionality of attitudes has become especially evident with the advent of implicit measures. In this line of research, attitudes have been operationalized as good or bad feelings that are either implicit and automatic, or explicit and deliberate (e.g., Greenwald & Banaji, 1995; Nosek et al., 2007).

It should be emphasized that a one-dimensional approach is often entirely sufficient. This is the case when an object is altogether good or altogether bad, or somewhere in between, without any mixed or ambivalent feelings towards it. Moreover, it is often the case that the behavior of interest is one-dimensional in it self (e.g., approach-avoid a person or buy or not buy a product). In these cases, it makes perfect sense to predict it from a one-dimensional attitude concept. Whether a one-dimensional approach to attitudes is an appropriate focus for social psychology in general is beyond the scope of this thesis. I will only conclude that there are pioneering studies in several areas that demonstrate the relevance of a two-dimensional warmth and competence approach, for example in how we perceive corporations (e.g., Aaker, Vohs & Mogilner, 2010) or brands (Fournier & Alvarez, 2012). However, the remaining of this thesis will focus on one area where this two-

dimensional approach has already started to mature and prove its value: intergroup bias.

## Intergroup bias: attitudes, prejudice and stereotypes

Traditionally, research into this area has typically dealt with whether stereotypes, prejudices and attitudes are good or bad, and whether groups are favored or discriminated. This can perhaps be best illustrated by the most recent review of implicit and explicit measures of intergroup bias and their behavioral correlates (Greenwald, Poehlman, Uhlmann, & Banaji, 2009). This meta-analysis was based on several dozens of intergroup bias studies, and with one exception (Amodio & Devine, 2006) they all had a one-dimensional perspective.

### **Attitudes and prejudice**

One of the main lines of research into intergroup bias has been based on the concept of attitudes. Such research typically involves measuring, by means of self-report or implicit measures, how positively or negatively a group is evaluated. In a sense, how much we like or dislike them (Greenwald & Banaji, 1995; Greenwald et al., 2009). The focus of this research has typically been on the ingroup vs. the out-group, and most often White people compared to Black people (Greenwald et al., 2009). Naturally, if you are studying groups that are negatively stereotyped on both dimensions (which out-groups tend to be when contrasted with the ingroup), a two-dimensional perspective is less appealing than if the group's stereotypes are mixed (e.g., warm but incompetent). Hence, the reason for the lack of a two-dimensional perspective in this line of research may be due to the groups studied.

Besides being viewed as attitudes, prejudice has also been conceptualized into more specific cases, such as the case of the classical and modern racism scale (McConahay, 1986; Akrami, Ekehammar & Araya, 2000). These types of scales are also available for other groups such as prejudice towards people with disabilities (Akrami, Ekehammar, Claesson, & Sonnander, 2006). In this tradition, the prejudice is understood as a quite complex phenomenon, but the idea is still to reduce it to a single bipolar scale. In other words, how much of a modern (or classical) racist are you? Nonetheless, this perspective allows the possibility of being a non-racist in a classical sense, but being a modern racist. This area of research is important because it allows us to draw a clear line between people who are blatantly prejudiced in a classical way, for example by having the attitudes that ethnic minorities smell bad and that women should literally stay in the kitchen, and those who instead endorse the



more subtle modern forms, such as denying the existence of discrimination and thinking that minorities fight for equal rights have gone to far.

A notable exception in this traditionally one-dimensional perspective is the pioneering work on ambivalent sexism (Glick & Fiske, 1996), which is perhaps the first two-dimensional theory of prejudice that had any large impact on the social psychology literature. Its basic principle is that sexism has two components: benevolent and hostile sexism. This captures that women may, based on their gender, be targets of both benevolent acts (e.g., someone opening a door; ladies first) and hostile acts (e.g., sexual harassment). Unlike modern and classical prejudice, where both dimensions are clearly bad, but in different ways, a high on benevolent sexism brings with it some positive aspects, for example the sexist belief that women should be protected. Yet, this is not the same as a warmth and competence perspective where an increase (e.g., warmer or more competent) is truly a beneficial stereotype. Rather, both forms of sexism are prejudiced acts, although the benevolent kinds are, of course, less undesirable than the hostile ones.

## **Stereotypes**

Research on stereotypes has taken a more diverse and nuanced approach, sometimes looking at very specific stereotypes. A good example is how women are stereotyped as poor at math and the natural science (Nosek et al., 2009), or how obese people are specifically stereotyped as lazy (Schwartz, Vartanian, Nosek & Brownell, 2006). However, these studies have always had the distinct aim of looking at a group that is being negatively stereotyped and what has changed is only the scope. That is, if it is a generally negative stereotype, or a very specific one that is being studied. This focus is perfectly understandable, since, after all, focusing on groups that are in a bad position because of their stereotypes is an important goal for a social scientist, and looking at very specific stereotypes may yield higher predictive validity. However, perhaps because of this understandable focus, there have been very few attempts to get a complete picture of how groups are stereotyped. Indeed, only because a group is negatively stereotyped in a specific sense, it does not mean that the group is negatively stereotyped in general. In order to establish that, we have to apply a more exhaustive perspective on stereotypes. This is exactly what is done in the stereotype content model (SCM; Fiske, Cuddy, Glick & Xu, 2002).

## **A new take on stereotypes: the Stereotype Content Model**

The stereotype content model provides a framework for categorizing stereotypes in terms of warmth and competence (Fiske et al., 2002). It postulates that the bulk of stereotype content consists of characteristics that are either warmth or competence

related. Some groups are stereotyped as altogether negative, neither warm nor competent (e.g., homeless people, some ethnic minorities). Other groups are stereotyped as both warm and competent, typically the majority group in a society or one's own ingroup. The important contribution of the SCM is the idea that some stereotypes can be mixed, in that some groups are stereotyped as competent but not warm (e.g., Asians, Jews) or as warm but not competent (e.g., old people). The hypothesis that stereotypes can be explained by the two dimensions warmth and competence has been confirmed in several studies, using a variety of samples including national representative US sample (Cuddy, Fiske & Glick, 2007) and by comparing samples across different cultures (Cuddy et al., 2009).

As mentioned earlier, the traditional one-dimensional approach to intergroup bias might not necessarily be a blunt perspective per se, but rather an appropriate choice for the groups being studied. Indeed, if we look at the ingroup or the majority group in a society, they are typically stereotyped as warm and competent, while many of the classical studied groups (e.g., ethnic minorities) are stereotyped as low in both dimensions (Fiske et al., 2002, Cuddy et al., 2009). This means that when we compare a classically stereotyped group with the ingroup or the majority group, there are very small differences between a two-dimensional approach and a traditional one-dimensional approach. Consequently, it is when we look at less obvious groups (e.g., Asians) or when we compare different out-groups with each other (e.g., Greeks vs. Germans from a Swedish perspective) that the SCM really starts to matter. However, there is another important aspect even in the classical comparison. By looking at both warmth and competence we can see that some groups are stereotyped as low in both, and this is a much more exhaustive negative stereotype than a more general negative one, suggesting that this group is believed to be entirely bad without any good qualities at all (Fiske et al., 2002).

## A new take on prejudice

The focus of the present thesis is on a warmth and competence perspective in intergroup bias. The main reason for this is that a two-dimensional perspective has the potential of giving a more nuanced picture of intergroup bias. In relation to this, it is important to note that there is a parallel research tradition to this two-dimensional perspective that is neither one-dimensional nor two-dimensional. Rather it is based on a set of specific prejudiced emotions. This mirrors the classical debate in emotion science regarding whether emotions are best understood as dimensions (e.g., Russell 1991) or as specific emotion categories (e.g., Ekman, 1992).

In the specific emotional prejudice approach (Neuberg & Cottrell, 2006), prejudices are not simply good or bad feelings but qualitatively distinct emotional tendencies (e.g., disgust or fear). This has clear advantages over a one-dimensional

attitude approach. Consider, for example, the prejudices toward black men and homosexual white men. Both may be, on the surface, negative. A person may dislike both black men and homosexual men of any race, and he or she may do so equally much. Yet, this dislike may be driven by entirely different process. The dislike toward the black men may be driven by fear that black people are out to hurt you. Indeed, research suggests a fear response toward black people among white prejudiced individuals (e.g., Cunningham, Johnson, Raye, Gatenby, Gore & Banaji, 2004). In contrast, the negative attitude toward homosexuals may be driven by disgust in that people find them unnatural, immoral or perhaps like a disease. Feeling that someone is disgusting or that someone is dangerous is clearly very different (Neuberg & Cottrell, 2006).

It may not come as a surprise that this perspective is heavily evolutionary focused (Kurzban & Leary, 2001). It has been argued that we have a natural tendency to fear what is unknown (e.g., out-groups) but similarly to have feelings of disgust to what appears sick or unnatural (Neuberg & Cottrell, 2006). The idea is that these are generally rational and evolutionarily relevant feelings that are simply over-applied in the individual case. Those who approached the unknown with caution did not end up on the wrong side of a spear. And long before people had any concept of bacteria or viruses, avoiding people who appear weird or sick in any way may have been extremely important in reducing the risk of contracting diseases (Kurzban & Leary, 2001).

Although our understanding of a multi-dimensional approach to intergroup bias would, of course, best consider both perspectives, there has been little exchange between these parallel research traditions and no attempts to integrate them, making such approach a huge undertaking. At some point in a thesis it becomes necessary to narrow the scope. As such, I will settle with focusing on a warmth and competence perspective on intergroup bias, without delving further into the issue of specific prejudiced emotions.

## Aims of the present thesis

From a theoretical viewpoint it is clear that a two-dimensional warmth and competence perspective on intergroup bias has potential over and beyond a one-dimensional perspective. The overall aim present of the present thesis is to apply this perspective to aspects of intergroup bias that has so far received little attention in the literature.

First, the role of warmth and competence for stereotypes has only been confirmed on the explicit level. In fact, research supporting the SCM has almost exclusively relied on explicit self-reports, with the notable exception of a historical text analysis (Durante, Volpato, & Fiske, 2010). An important question is thus if this two-dimensional perspective extends to the implicit level as well. If so, then it would mean that implicit stereotypes could also be mixed in terms of warmth and competence. The first aim of the present thesis is thus to investigate warmth and competence stereotypes by means of implicit measures.

Second, very few studies have looked into the unique importance of a two-dimensional perspective for discrimination. A potentially important unique aspect of this perspective is that discrimination may be mixed in terms of warmth and competence. The second aim of the present thesis is thus to investigate if mixed stereotypes may lead to mixed discrimination.

Third, besides mixed discrimination, warmth and competence stereotypes may be important for classical one-dimensional discrimination as well, because stereotype content may interact with other types of individuating information. The third aim is thus to see to what extent individuating information pertaining to warmth and competence may moderate discrimination.

Fourth, research in this area has so far been highly theoretical, with no applied research. The fourth and final aim of the present thesis is to apply a two-dimensional warmth and competence perspective in the case of real-life hiring discrimination.

The four aims of the present thesis have been the focus of three separate studies that can be found in the appendix. Study I focused on the first aim and Study II on the second. Finally, Study III dealt with aims three and four.

The remainder of this thesis has the following outline. First, previous research relating to implicit stereotypes is reviewed. Then follows a section about the implications of warmth and competence stereotypes for discrimination. After this, I present an overview of the present research along with the more specific aims. The three original articles that the present thesis is based on are then summarized. A general discussion concludes the thesis.

## Implicit and explicit stereotype content

Although there are many studies supporting the SCM's postulate that stereotypes can be organized in terms of warmth and competence (e.g., Fiske et al, 2002, Cuddy et al., 2007; Cuddy et al., 2009) nearly all share the same methodology in that people are asked to explicitly report the stereotype content toward groups. This is typically done on scales, asking the participants to rate how warm, friendly, competent (and so on) a group (e.g., Asians) is viewed in society in general. However, considerable research suggests that explicit self-reports are not without problems (e.g., Fazio & Olson, 2003; Greenwald & Banaji, 1995). This is especially true for sensitive (such as stereotypes) questions, where people may not want to express what they truly believe. Instead, people may express a more socially desirable opinion (Fazio & Olson, 2003). This raises doubt regarding one of the most important findings based on the SCM: that many stereotypes are mixed (i.e., warm but not competent or competent but not warm). Is this perhaps in part a result of a compromise between expressing your negative stereotypes and trying to appear to be a nice person? Do people actually think that groups are entirely bad (or good) but grant them a few good traits just to appear nice?

First, we have to conclude that it is highly unlikely that self-report bias could be driving the results of mixed stereotypes in entirety. This is because it cannot explain why people agree on lowering the warmth, but not the competence, toward certain groups (Jews, Asians) while doing the opposite toward other groups (e.g., old people). If it were simply a matter of appearing socially desirable, then people would lower (or increase) either warmth or competence randomly. On the other hand, it is possible that the reliance on self-reports makes tiny differences in how mixed the stereotypes are, become blown up to appear very large. That is, people may agree on that Jews are *more* competent than they are warm, and they thus state that Jews are competent but not warm. But what they actually think is that Jews are quite incompetent and extremely cold. This effect could be particularly important in contrast to in-groups where people might take the trait the out-group is highest on and raise that to that of the in-group in order to not appear prejudiced, and report their true beliefs only on the other dimension. In actuality, the out-group may be lower on both dimensions to the in-group, albeit further away on one of the two dimensions.

In sum, relying solely on self-reports to investigate stereotype content may not reveal as negative stereotypes as they are in reality. Furthermore, stereotypes may appear much more mixed than they actually are if people over-compensate on the other dimension in order to appear socially desirable. This is a problem in the literature. If stereotypes are truly as mixed as the empirical evidence based on self-reports suggests, then a warmth and competence perspective is a great improvement over a one-dimensional (classical approach) to in-group bias. However, if these mixed stereotypes are trivial differences that are blown up due to self-reporting bias, the

importance of a warmth and competence perspective may be only academic, with little applied value.

Another limitation with relying on self-reported stereotypes is that they cannot capture people's automatic, or implicit, stereotypes (Greenwald & Banaji, 1995). During the past decade, implicit measures have become one of the most popular ways to capture stereotypes, attitudes and prejudice. Not only do implicit measures of stereotypes prevent people from adjusting their responses to appear more socially desirable; the actual construct tapped may be very different. People may have one automatically activated stereotype that they lack introspective access to, meaning that they would not be able to express it accurately no matter how motivated they are (Greenwald & Banaji, 1995). Indeed, implicit and explicit stereotypes do generally only correlate weakly or moderately, suggesting that they are quite different (e.g., Hofmann, Gawronski, Gschwendner, Le & Schmitt, 2005; Nosek et al., 2007). Importantly, these weak correlations cannot be only due to different methodology, since other constructs, such as attitudes toward political candidates, show consistently strong correlations between implicit and explicit measures (Nosek et al., 2007).

In the case of stereotype content, there could be even more differences between explicit and implicit constructs. It is possible that the automatically activated stereotype content is not organized in terms of warmth and competence at all, but rather as a single valence (i.e., Good-Bad) dimension, and that details such as warmth and competence may only be introduced later on as a result of more controlled processes. Hence it is possible that stereotypes are only mixed on the explicit level and not the implicit level. This would be the case if the implicit construct is an association that answers the question if the group is good or bad, and explicit processes answer the question: in what way is this group bad (or good)? The only previous study on this topic actually suggests this type of model. Wade and Brewer (2006) did not find any evidence for mixed stereotypes when using implicit measures, but they did so when using explicit measures.

While the pioneering work of Wade and Brewer (2006) is, of course, extremely important, there are reasons to pursue this issue further. First, that study used a measure that is no longer as popular in the study of stereotypes (a Lexical decision task). It is possible that this measure was not sensitive enough to distinguish between warmth and competence on the implicit level. Furthermore, while this empirical study points to that implicit stereotype content is not organized in terms of warmth and competence, basic research in social perception strongly point to that it could certainly be organized in that way. Importantly, studies have found that we can judge warmth and competence in the fraction of a second (e.g., Willis & Todorov, 2006). Hence, there seem to be no perceptual need for stereotypes to be one-dimensional in valence. We are thus likely *capable* of having implicit stereotypes in terms of warmth and competence. Yet, from a survival perspective, a simple but fast approach-avoidance association to objects do, of course make sense, and we might worry about the details (e.g., avoiding for low competence or low warmth) later on. Moreover,

warmth is typically considered the primary dimension (Fiske et al., 2007) suggesting that it could be that implicit stereotypes would deal with warmth, and stereotypes about competence are more thought-through processes. For example, that we quickly decide if someone is a friend or foe, but take more time in deciding whether they are competent friend or foe. However, although warmth seems to be judged first and competence later on, both are rapid (Willis & Todorov, 2006).

In sum, whether implicit stereotype content can be mixed is an open question at this point. Importantly, there are several important advantages of introducing implicit measures in the study of stereotype content. First, if stereotype content is mixed on the implicit level, it is highly unlikely that this result is due to people trying to mask their true stereotypes. Furthermore, it points to that the stereotyping in terms of warmth and competence may not necessarily occur consciously. While it is certainly possible that people are aware of and realize when they apply such implicit stereotypes, this is not required, as it would need to be if it was the result of more cognitive thought-through processes. Finally, that people may not be fully aware of stereotyping due to warmth and competence is especially important since these stereotypes are less obviously negative. In other words, if implicit stereotypes are subtle to begin, mixed implicit stereotypes may be even more subtle and hard to become aware of.

## Unique implications for discrimination

Studying stereotypes is interesting and important in its own right, but another important question is what their implications are. Why does it matter if stereotypes are organized in terms of warmth and competence? One such implication is derived from the stereotype content model (Fiske et al., 2002) that proposes that different combinations of warmth and competence stereotypes give rise to distinct prejudiced emotions. Specifically, groups that are both warm and competent are admired; groups stereotyped as competent but not warm are envied (e.g., Asians, Jews); those viewed as warm but not competent are pitied (e.g., old people); finally we feel contempt towards those who are neither warm nor competent (e.g., homeless, ethnic minorities with low status such as Arabs). Furthermore, an extension of the SCM, behaviors from intergroup affect and stereotypes, (the BIAS MAP; Cuddy et al., 2007, see also Cuddy, Fiske & Glick, 2008) provides a model for how these prejudiced feelings may mediate active and passive discriminating behaviors. Specifically, groups that are admired (warm and competent) elicit both active and passive facilitation. Groups that are being envied (cold but competent) are also targets of passive facilitation, but they are likewise targets of active harm. That is, we are getting along with them (passive facilitation) because it is beneficial to collaborate with a competent person, but we may still actively attack (active harm) them because they are our enemies. In contrast, groups that are pitied (warm but not competent) elicit passive neglect, such as when

people forget about the needs of old people, but may still be targets of active help. Finally, the groups towards who we feel contempt (cold and incompetent) are sometimes passively neglected for their low competence (e.g., people ignoring a homeless person) and sometimes actively attacked for their perceived low warmth (e.g., hate crimes against ethnic minorities).

Cuddy et al. (2007) do not only present this model, but also provide some initial support for this model in showing that people's perceptions of how groups are stereotyped and treated fits very nicely with the model's predictions. Furthermore, this model has spawned several research efforts (e.g., Becker & Asbrock, 2012; Ufkes, Otten, van der Zee, Giebels, and Dovidio, 2012).

### **A direct effect of warmth and competence stereotypes**

One implication of a warmth and competence perspective on discrimination that, at the planning of this thesis had received no attention, is that warmth and competence stereotypes may be directly applied in an attempt to gain information about individuals. In doing so, people may discriminate towards these individuals.

The distinction between a direct stereotype application effect and an emotionally driven effect (the BIAS MAP; Cuddy et al., 2007) can perhaps best be understood by two theories of labor market discrimination in economics: taste-based (Becker, 1957) and statistical discrimination (Phelps, 1972; Arrow, 1973). Taste based discrimination is that the employer choose to not hire certain people because of preferences. This is similar to the valence driven effect studied in social psychology. An important distinction, however, is that it does not have to be the employer's own preferences, but might be his or her perception of what other employees or customers prefer.

Statistical discrimination (Phelps, 1972; Arrow, 1973), in contrast, suggests that employers hire the applicant that maximizes the expected profit for the firm. However, because he or she does not have perfect information about workers, the employer relies on statistical data in making these decisions. For example, that some groups in average have worse education, less work experience, more sick leave and so on. In social psychological terms, the employer relies on stereotypes. For example, the employer may have the statistically (i.e., stereotypical) based belief that a certain group is not as competent, and thus choose not to hire individuals belonging to that group if other workers are available.

It should be noted that in economics, this statistical discrimination could be considered a rational and efficient solution to the problem of having less than perfect information about potential workers (Phelps, 1972; Arrow, 1973). This can only be true, however, when applying stereotypes actually improve precision in the individual case over and beyond a guess based on the mean value of people in general. In other words, it is only efficient if stereotypes are accurate. Of course, there is often a kernel



of truth to stereotypes meaning that relying on them will often improve accuracy, at least more so than social psychology tend to give stereotypes credit for (see further Jussim, Cain, Crawford, Harber & Cohen, 2009 for an extensive review of this controversial topic). Furthermore, in a labor market discrimination context, it is not that hard to come up with scenarios where our stereotypes may be true more often than wrong. Imagine someone who has recently immigrated to Sweden. It can be assumed that he or she is not particularly good at Swedish. If good language skills in Swedish are crucial for the job, then it may be beneficial for the employer to give less priority to these applicants compared to native Swedes, provided that the employer have no other source of information regarding the language skills than that the person is an immigrant. The employer may also, quite accurately, assume that an immigrant from Norway is better at Swedish than an immigrant from Iraq. In other words, by using statistical data that is true in general, the employer can improve his or her hiring decision when there is no other source of information.

Although statistical discrimination can improve accuracy in general, it cannot be true in all cases. We could imagine a scenario with an immigrant that speaks a very hard Norwegian dialect without bothering to learn Swedish properly, and thus in fact has worse Swedish skills than a talented Iraqi who learned Swedish swiftly. Similar, a native speaker is not always good at his or her own language. For example, many non-native English-speaking researchers are likely better at expressing themselves in written English than many native English speakers with low education. Hence, even if statistical discrimination may be based on information that is true on average, individuals will be discriminated in specific cases.

There is also the possibility that the data that statistical discrimination is based on is flawed, or biased, to the extent that it will not improve accuracy at all. When it comes to warmth and competence stereotypes, research suggest that these may not be accurate. The SCM (Fiske et al., 2002) postulates that warmth stems from perceived competition. The most extreme examples are clear enemies vs. clear allies, but people may also perceive that immigrants compete with them for job positions and thus stereotype them as cold, regardless of how warm they truly are. Competence, on the other hand, is derived from status. That is, we believe that people who have done well have deserved it and thus that they must be competent. Hence, if people drive nice cars and live in attractive houses, we tend to stereotype them as competent. Conversely, ethnic minorities who have fled from another country and have yet to gain high status positions in their new country may be stereotyped as having low competence, even if they had very high status in their home country. In sum, high status brings respect and leads to assumed high competence, whereas low competition brings liking and leads to assumed high warmth. These paths have been confirmed both by correlational (Fiske et al., 2002) and experimental studies (Caprariello, Cuddy & Fiske, 2009). Hence, relying on warmth and competence stereotype as a source of information may result not only in unfair treatment of individuals, both of entire social groups.

## **Mixed discrimination**

Having turned our focus to the direct effect of stereotype content on discrimination, what would we predict differently based on this approach compared to a more classical one-dimensional? One obvious conclusion is that if stereotypes can be mixed in terms of competence, then perhaps discrimination itself can also be mixed in the same manner. People may be discriminated for their low warmth *or* for their low competence. If so, it follows that people who are low in one dimension and high in the other, may at the same time be both discriminated and favored, compared to a group who is neutral in both dimensions.

Let us look at how this affects our understanding of ethnic discrimination. We know that the majority group in one's own country (ingroup) is typically stereotyped as high on both dimensions, whereas other ethnicities are stereotyped as low on one or both of the dimensions (Fiske et al., 2002; Cuddy et al., 2009). A group that is low in both dimensions should be discriminated due to an assumed lack of both warmth and competence (e.g., Arabs), while other groups may only be negatively treated when warmth or competence is in focus. It gets especially interesting when there are two groups who are mixed in opposite direction that compete against each other. Consider for example a German (stereotyped as cold but very competent) contrasted against a Greek (warm but not competent) and where the person who is in the position to discriminate is Swedish. In instances where competence is salient, the German should be favored compared to the Greek, but the German should be discriminated when compared to a Greek in a warmth context. Importantly, these groups may be treated equally on average, but still very differently in the specific cases, because of the opposite direction of their stereotypes. Perhaps people are more inclined to invite a Greek to a party, but more likely to trust a German to construct a building.

In sum, a specific and important consequence of stereotypes being mixed in terms of warmth and competence is that discrimination may be mixed in the same way. This type of mixed discrimination is the focus of Study II of the present thesis.

## **The interaction of individuating information and stereotype content**

Another potential implication of a warmth and competence perspective is that stereotype content may interact with individuating information. This is in itself nothing new. Classical studies that have shown that individuating information can reduce our tendencies to rely on social categories for information (e.g., Kreuger & Rothbart, 1988). What is new with what is proposed here is to consider both the warmth and the competence dimension at the same time. Specifically, if we are unsure about warmth and learn only about competence through individuating information, this may not help. If anything we may find the person even less warm

because of compensatory effects (e.g., Kervyn et al., 2009). If the person responsible for hiring finds both warmth and competence to be important for the job, then simply making up for it in one dimension will not be enough.

There is one previous study that has looked into how other types of information of individuals interact with warmth and competence stereotypes. Cuddy, Fiske, and Glick (2004) examined the warmth and competence of individual women and men and experimentally manipulated whether they had become parents. There was no difference between ratings of men and women on competence, but a slight advantage for women over men on warmth. They also found that women appear less competent, but warmer, after becoming mothers. Men on the other hand increased their warmth without losing any competence. Hence, the authors concluded that whereas women face a trade-off (competence for warmth) when becoming parents, men have everything to gain from it and in fact make up for their initial lower warmth. Of particular interest for the present thesis is how these perceptions of warmth and competence affected behavioral intentions to recommend these persons for career-advancement. Becoming a mother reduced your chances, but becoming a father did not. Importantly, this was related to the perceived competence. As such, losing competence when becoming a mother was hurtful in this study, but gaining warmth did not matter.

The study by Cuddy et al. (2004) suggest that warmth and competence stereotypes are not directly applied as-is, but rather interacts with other information sources that relates to warmth and competence, such as parenthood. Consequently, it is possible that the same would be true for individuating information when people of different social groups apply for real job openings. Indeed, this seems highly likely in the case of statistically driven labor market discrimination. If an employer has access to diagnostic individuating information about an applicant's warmth and competence, then there is no rational reason to statistically discriminate that worker based on lack of information pertaining to these dimensions.

## Warmth, competence and real-life hiring discrimination

Basic laboratory research and applied field research both have their strengths and weaknesses. Laboratory studies always have the possibilities not to extend into real-life, resulting in low ecological validity. Field studies, even field experiments, on the other hand, are by necessity always compromises between what the researches want to be able to study, and what is possible to study outside the lab. As such, these types of approaches are best used jointly, as they are useful for answering quite different research questions. Hence, extending the research on the role of warmth and competence in discrimination to include real-life hiring discrimination was a natural next step taken in Study III of the present thesis.

Field experiments of hiring discrimination is typically done in the form of correspondence testing where the researcher sends out fictive applications and observes the difference in callback rates between experimentally different versions of the applications (e.g., Bertrand & Mullainathan, 2004; Riach & Rich, 2002; M. Carlsson & Rooth, 2007). In contrast to the laboratory experiment where the research has full control of every aspect, and full view of the entire process, in these field experiment the researcher has control only of how the application is written, and can only observe whether the applicant is given an interview or not. Very little can be known about the employer, apart from available details such as type of job opening, perhaps the gender of the employer and so on. Contacting the employers beforehand would be problematic, since the employee should not know about him/her participating in a study, in order to make sure the experiment remains unobtrusive. Of course, the researcher can always interview them afterwards, but this is a very costly process, especially since field experiments sometimes are large (thousands of participants) and employers may be hard to reach. Furthermore, it is always problematic to predict behavior (e.g., discrimination) after the fact. Hence, although there are exceptions (e.g., Rooth, 2010), in these types of experiments, the actual hiring process is a black box and the researcher can only observe what comes in (the applicant) and what comes out (being called to a job interview or not). Fortunately, this black box can be quite informative. By changing the group that the applicants belong to, the level of discrimination can be studied. However, one can also study how other aspects of the application affects hiring decisions, and, important for the present research, how it interacts with discrimination.

Field experiments of hiring discrimination is a perfect fit for studying how individuating information of an applicant interact with stereotype competent. This is because it is easy to manipulate the ethnicity of a candidate, as well as how warm and competent the candidate appears, by means of details in their applications. Hence, it is possible to study how warmth and competence individuating information interacts with the discrimination effect. For example, if an applicant that is stereotyped as cold and incompetent proves this wrong by appearing as a truly nice and capable person in the application, will this remove the discrimination? Conversely, groups that are assumed to be both warm and competent might have their edge removed if their application suggests that they are neither. To investigate this, Study III consist of a hiring experiment where a stereotypically low warmth and low competence group (Arabs; see for example Cuddy et al., 2009) is contrasted against a stereotypically high warmth and high competence group (Swedes; the ingroup) and where this interacts with individuating information in terms of warmth and competence. If discrimination in the labor market against Arabs is mainly due to their stereotype being low in competence and low in warmth, and this is being directly applied (a type of statistical discrimination albeit inaccurate) then Arabs and Swedes should be equally treated if these characteristics are signaled elsewhere in the application.

# Summary of the studies

## Overview

The overall aim of the present thesis is to investigate implicit stereotypes and discrimination from a warmth and competence perspective. First, Study I will investigate the existence of mixed implicit stereotypes. This will serve to rule out the potential confounding factor of social desirability driving mixed stereotype content, as well as provide an insight into whether warmth and competence in stereotypes are automatic, effortless and implicit, or if they are introduced later on after more controlled thought-through processes have taken over, after an initial valance-based automatic reaction.

Study II will investigate whether discrimination can be mixed in the same manner as stereotypes are. This is important since it will highlight the importance of a two-dimensional warmth and competence perspective, since mixed discrimination means that groups that are treated equally overall may still both be discriminated, but in different ways, depending on whether warmth or competence is in focus. Importantly, this study will look-into the direct application of stereotypes in the specific case, rather than their effect through mediating prejudiced emotions, that has been the focus of previous research (Cuddy et al., 2009).

Finally, Study III will apply a warmth and competence perspective in the context of real-life hiring discrimination and also study the interaction of warmth and competence stereotypes with individuating information. By comparing a group that is low in both warmth and competence (Arabs) with one that is high in both (Swedes), and also varying whether how the applicant is described in terms of warmth and competence in their application's personal letter, this study will see how much of the discrimination toward Arabs can be reduced by making the Arab warmer and more competent than the Swedish applicant.

## Study I: Implicit stereotype content

The aim of Study I was to investigate if stereotypes can be mixed in terms of warmth and competence on the implicit level. Choosing what implicit measure to use, especially given the null result of the previous study by Wader and Brewer (2006) in the area, was as such essential.

There are a great number of measures that aims to capture implicit constructs such as attitudes and stereotypes: affective priming tasks (Fazio, Sanbonmatsu, Powell, Kardes, 1986), semantic priming tasks (Wittenbrink, Judd & Park, 1997), the Extrinsic Affective Simon Task (De Houwer, 2003), the Go/No-Go association task (Nosek & Banaji, 2001), the Affective Misattribution Paradigm (Payne, Cheng, Govorum & Stewart, 2005), the Sorting Paired Features task (Bar-Anan, Nosek & Vianello, 2009), to name some of the most widely used measures (see also Petty, Fazio & Briñol, 2008 and Fazio & Olson, 2003 for overviews). The by far most used, and well studied, is the Implicit Association test (Greenwald, McGhee & Schwartz, 1998). The IAT is a computer-based procedure where you rapidly classify stimuli (such as words or images) into four different categories by pressing one of two keys. The central idea of the IAT is that stronger associations between two categories that share a key will lead to easier (and thus faster) classification of the stimuli. It is this difference in response times between different key combinations that makes it possible to infer relative differences in implicit (or automatic) associations.

The IAT has been used in numerous of studies from widely different areas, such as spider phobia, beverage preferences, political attitudes, and of course intergroup bias (see Greenwald et al., 2009 for an overview). Furthermore, a meta-analysis by Greenwald et al. (2009) shows that the IAT can predict relevant criteria, such as amygdala activity and negative behaviors towards social groups (e.g., black people).

The IAT's validity has been scrutinized in numerous of studies that have brought potential concerns in the light. This has lead to improvements of the IAT, and in how it is implemented, and it is now possible to avoid many of the initial problems with the test. For example, a study by McFarland and Crouch (2002) found that the IAT had a cognitive skill confound in that longer reactions times overall lead to artificially stronger associations because of the scoring. These discoveries lead to the development of a new scoring algorithm (Greenwald, Nosek & Banaji, 2003) that greatly reduces this problem. Similarly, there have been attempts to fake the IAT, and it has been found that it is hard but not impossible. However, as this requires special skills of the test takers, and because it is statistically detectable, this is now of less concern (Cvencek, Greenwald, Brown, Snowden & Gray, in press). In sum, more than a decade of constant scrutiny and improvement of the IAT and its

implementation has yielded a quite robust measure that is useful, but of course not without limitations (Lane, Banaji, Nosek & Greenwald, 2007).

One of the limitations of the IAT is that it is an inherently relative measure. A typical attitude IAT consists of two groups being compared, such as black people and white people, along with two categories, typically good and bad. The key combinations being contrasted are thus White + Good/ Black + Bad vs. White + Bad / Black + Good. Hence, it is impossible to tell whether it is the associations that Blacks are bad, or Whites being good, that is captured. It could even be the non-associations that Whites are bad or the non-association that Blacks are good, that is the primary source of the reactions times. Or it may be any combination of these four alternatives. As such, the IAT provides truly relative measures of associations that does not allow it self to be pinpointed (Lane et al., 2007; Nosek, Greenwald & Banaji, 2005).

When measuring attitudes, the relative nature of the IAT is not always a big problem. While it fails to distinguish between out-group derogation and ingroup favoritism, it still provides us with a relative difference between the valences of the two groups that can be relevant for relative difference in treatment, such as discrimination. It gets more complicated when the IAT is used to capture stereotypes. Consider for example an IAT that captures the stereotype that men are associated with science and women with liberal arts. It is impossible to tell if it is women who are associated with liberal arts, men with science, or if it is that men are not associated with liberal arts and women who are not associated with science, or any combination thereof. In the most extreme case, it may be that women and men are equally associated with liberal arts, but men more strongly with science – or the other way around. Still, this stereotype measure has been useful, for example in predicting how well women have succeeded in math and science in different nations (Nosek et al., 2009).

Because of the relative nature of the IAT, it would be a mistake to employ an IAT with the categories warm and competent in order to capture mixed stereotypes in terms of warmth and competence. If one group were found to be warmer than the other was competent, this would be hard to interpret since it would not be possible to disentangle if the difference between the groups was regarding warmth or competence or any combination thereof. The solution for this problem in the present study is to measure one dimension at a time. That is, one warmth IAT and one competence IAT. This is perhaps not the most elegant solution, nor the most practical one. Neither is it without limitations (the most serious one being potential order effects), but it is well suited for demonstrating the existence of mixed implicit stereotypes.

Why then, not use another type of measure that circumvents this problem? Indeed, other implicit measures share similar ideas and are also based on reaction time, but do not have the same limitations as the IAT. Rather they all have their specific strengths and weaknesses. For example, the sorting paired features task involves four keys and allows for associations less relative as the ones in the IAT, but on the other hand, it is more complicated and less validated. Another example is

priming based procedures that have the advantage of being truly implicit in that the participant will not even be aware that his or her attitude or stereotype is being measured. However, these measures tend to have weak effect sizes. There are also variants of the IAT that tries to reduce the problem. These include the brief implicit association test (Sriram & Greenwald, 2009) that retains the two categories of the IAT but only focus of one at a time. Another option is the single category IAT that would remove one category altogether (Karpinski & Steinman, 2006). The problem with this last approach is that one has little control over exactly what the non-existent alternative category is. The BIAT on the other hand has a focal category, thus forcing people to focus on, for example, the positive dimension. Still, this measure is quite new with few studies investigating its validity and reliability.

For the present research it was important to choose the most reliable, and commonly used measure of implicit stereotypes. The reason is that there exists one study with a null result (Wade & Brewer, 2006) using a less (at this time and in this context) commonly used implicit measure of stereotypes (a Lexical decision task). Experimenting with new measures that may be better in some ways might thus increase the risk of a false negative to unacceptable levels. Hence, it was important for the purpose of the present thesis to choose the most sensitive test in order to avoid replicating a null results simply due to a weak measure. The IAT was thus a natural first choice, since it reliably produces strong effect sizes and is well understood in terms of validity and reliability (Lane et al. 2007).

The next step was to decide what groups to investigate stereotypes toward. There were two important aspects to consider. First, it was critical to choose two groups with clear stereotypes in the opposite direction. That is, one group with low competence and high warmth to be contrasted with one group with high competence and low warmth. This was important because the IAT can only compare relative difference between two groups. Second, in order to be able to confirm the validity of the IAT it was preferable to choose groups that were not sensitive to express negative opinions about. This is because one way to confirm validity is to correlate the implicit and explicit measure with each other and this correlation becomes weaker if the topic is sensitive (Nosek et al., 2007) As such, a pioneering work in this area would do best to focus on non-sensitive groups.

A pilot with 57 students (34 women, 23 men; median age 23.00, range 20–45) from various areas of studies, investigated stereotype content of 11 groups that could be used for the present research by means of conventional explicit measures of warmth and competence stereotypes. We also asked how sensitive it would be to express negative opinions about the group. Two groups stood out as particularly suitable: preschool teachers (high warmth low competence) and lawyers (low warmth high competence). Furthermore, these groups were quite easy to construct stimuli toward and easy to contrast (both being occupations) and they were also mutually exclusive in that you do not tend to belong to both groups. This made them suitable for the IAT.



We examine the validity of the IATs in two ways. First, we correlate them with explicit version of warmth and competence stereotypes. The prediction is that implicit and explicit competence should correlate positively, and so should implicit and explicit warmth. But implicit warmth should not correlate positively with explicit competence, nor should implicit competence correlate positively with explicit warmth. This predicted specific pattern of correlation thus served as our way to strengthen the validity of our IAT approach. It should be emphasized, however, that no strong correlations are expected since implicit and explicit stereotypes tend to correlate moderately or weakly (Nosek et al., 2007). We also wanted to strengthen the validity of the IAT approach in a different manner (Experiment 2). Specifically, we hypothesized that preschool teachers should not have mixed implicit stereotypes, but rather univalent positive stereotypes of their ingroup. Other people (who are not preschool teachers) should however, have the mixed stereotype.

## **Experiment 1: Method**

In the first experiment, 85 participants (53 women, and 32 men, median age 22, range 18 – 45) were randomly assigned to complete either a warmth or a competence IAT. Both IATs contrasted lawyers and preschool teachers. The category labels and stimuli can be found in the appended full article of Study I. The IAT effect was calculated by means of the D-algorithm, resulting in D-scores. The participants also filled out explicit measures of warmth and competence stereotypes.

## **Experiment 1: Results and discussions**

As predicted, the IATs revealed that preschool teachers were implicitly stereotyped as warmer than lawyers, but as less competent. Hence, the results suggest that implicit stereotypes can be mixed.

The result on the implicit level was mirrored on the explicit level. However, the correlations with the explicit measures were less clear. The competence IAT correlated moderately and significantly with the explicit competence scale. But as expected, it did not correlate with the warmth scale. On the other hand, the warmth-IAT correlated with neither of the explicit measures. As such, the validity of the warmth-IAT could not be strengthened by these correlations. This, along with the fact that the between subjects design of completing either a warmth or competence IAT could was not optimal, warranted a second experiment.

## **Experiment 2: Method**

This experiment was identical to the first one, except for the following. The participants consisted of both preschool teachers (20) and psychology students (34) in order to test if ingroup favoritism would result in non-mixed stereotypes. Furthermore, all participants completed both IATs, but in randomly assigned order.

## **Experiment 2: Results and discussion**

The results of experiment 1 were replicated. Unfortunately, this was also true for the relationship between the implicit and explicit measures, with only positive correlation between the implicit and explicit competence measure. However, the validity of the IATs was strengthened by its ability to detect ingroup favoritism. Indeed, the preschool teacher did not have mixed implicit stereotype content, but rather univalent positive of their own group. Interestingly, this was only true on the implicit level and not on the explicit. This suggests that the ingroup favoritism was not expressed explicitly, perhaps due to social desirability concerns, or perhaps due to lack of awareness of such ingroup favoritism.

## **Discussion**

Study I provides the first evidence that stereotype content can be mixed on the implicit level. In two experiments, the results suggest this to be the case. Because the results were so clear in two experiments, this study casts doubts on the possible confound that mixed stereotype are merely a result of a compromise due to social desirability concerns. However, this does not mean that it is business as usual and that we should continue to rely solely on explicit measures. Indeed, the IAT was sensitive to the ingroup favoritism effect while the explicit measures were not. This suggests that the IAT could be a more sensitive measure of warmth and competence stereotypes.

The implementation used in the present study, (two IATs) is perhaps not optimal, since it introduces error variance in form of order effects and potential contamination between the two measures. This could be the reason for the lack of correlation between the warmth-IAT and warmth explicit measure. Yet, the fact that the warmth-IAT did not correlate with the explicit warmth measure may not be the fault of the IAT, but rather of the explicit measure. Indeed, ingroup favoritism resulted in non-mixed implicit stereotypes, strengthening the validity of this approach, whereas the explicit measures did not reveal this expected ingroup favoritism.

The natural next step for future research is replication with other groups and other implicit measures. Particularly, the previous null result of Wade and Brewer

should be replicated. In doing so, future research should also try to relate these IATs to other criterion validity outcomes, such as discriminating behaviors.

## Study II: Mixed discrimination

The aim of Study II was to examine the occurrence of mixed discrimination. This was done towards lawyers and preschool teachers (as in Study I). But we also wanted to investigate mixed discrimination toward people due to their nationalities. We piloted the stereotype content of nationalities by means of a survey where 63 students (71% females, age 19–31, median 24 years) rated the warmth and competence stereotypes of people from European countries. We found that Greeks were rated as clearly mixed (low competence but high warmth) whereas Germans had the opposite mixed pattern (high competence but low warmth). Thus these two groups were included in the study along with lawyers and preschool teachers.

### Method

The study consisted of two experiments that differed only in whether the groups compared was lawyers vs. preschool teachers or Greeks vs. Germans. 136 business students (68% women, age 18–29, median 21 years) participated in the experiment contrasting lawyers with preschool teachers, whereas 80 students of various areas of study (55% women, age 19–49, median 23 years) participated in the study that compared Greeks vs. Germans.

In order to study mixed discrimination, we constructed a paradigm where participants were lead to believe they were to judge other peoples abilities to solve puzzles (competence-related discrimination) or ability to show empathy in a bogus “brain-scan” experiment (warmth-related discrimination). In order to achieve a strong test of discrimination, the participants were given an résumé of an individual, which contained irrelevant individuating information (e.g., favorite movie), the manipulated information (nationality or areas of study for lawyers and preschool teachers) as well as their scores on the test in previous sessions. Besides three fillers, there were always two matched (counterbalanced between participants) individuals who had the very exact preview score; they had taken equally long time to complete a puzzle and had equally strong empathy reactions in the supposedly real (but bogus) brain scan study. The participants were then asked to guess how well the individuals would fare in future sessions. This provided a very strong test for mixed discrimination. The participants would have to discriminate to the extent that they would, in fact, ignore that they had the correct answer and base (at least part of) their decision on nationality (or occupation) instead. That is, although the Greek and the German had the very same score on their first attempt of the puzzle, they would still think that the

German would do better in the future. Conversely, a Greek and a German with exactly the same empathy score on the first trial would render judgments that the Greek would do better.

After the experiment, but before the debriefing, the participants were thoroughly probed to check for suspicions regarding the studies purpose. Although a few suspected we studied discrimination, no one guessed it was towards the right groups. Instead, they guessed that we were studying gender discrimination. Most important, no one expressed any suspicion that they had judged anything but real people or suspected that that our paradigm was, in fact, bogus.

It should be noted that this paradigm is heavily influenced by Behavioral Economics methodology, specifically a study by Mobius and Rosenblat (2006). Their main idea was also to anchor participants' guesses in previews in order to examine if discrimination (in their case beauty) will prevail in spite of relevant information for the participant to ground their judgment on. However, that study did only study puzzle-solving skills, and hence did not investigate mixed discrimination.

## **Results and Discussion**

The results confirmed the predictions. The groups stereotyped as low in competence (Greeks and preschool teachers) were discriminated when it came to puzzle solving skills. In contrast, they were favored when it come to judgments of their empathy. Likewise, lawyers and Germans were discriminated when empathy was in focus, but favored when it came to puzzle solving. Importantly, this was done simultaneously by the participant, and was directed to what the participants believed were real individuals. Furthermore, this was a particularly strong test of discrimination, since the participant had the right answer. Indeed, if a Greek and a German both score the same on the first trial of a puzzle solving task, it is clear cut discrimination when you still believe that the German will fare better. This thus suggests that these stereotypes were strong enough to resist this type of individuating information.

If we collapse the two dimensions we find no evidence of discrimination. This is because we found very strong interaction effects, but no main effects. These four groups are treated equally overall, but they are still discriminated in a mixed sense. Hence, this study clearly demonstrate that a one-dimensional perspective based on an average would have missed discrimination altogether. Even worse, a study that only focused on competence would have concluded that Greeks and preschool teachers are discriminated (relative to Germans and lawyers). Had that study instead only focused on warmth, then that study would have concluded that Germans and lawyers are discriminated (relative to Greeks and preschool teachers). In sum, a one-dimensional perspective would have resulted in either a biased result, or a null result.

## Study III: Warmth and competence in real-life hiring discrimination

The overall aim of Study III was to apply a warmth and competence perspective to real life hiring discrimination. Rather than studying mixed discrimination as in Study II, the focus was this time on how individuating information in terms of warmth and competence would interact with discrimination. The two groups compared were Swedes and Arabs, and the experiment was conducted on the Swedish labor market. As such, and based on previous research (e.g., Cuddy et al., 2009), it was assumed that Arab applicants would be on the downside both in terms of warmth and competence compared to Swedish applicants.

We predicted that Arab applicants would be discriminated compared to Swedish applicant in that they would receive fewer job interview invitations. We also predicted that both warmth and competence enhancing individuating information in your application would increase your chances of getting a job interview. That is, applicants who describe themselves as particularly competent and/or warm would fare best. Furthermore, we predicted an interaction with this and ethnicity in that Arabic applicants should benefit the most from appearing both warm and competent, since these are the two dimensions they stereotypically lack. Importantly, the effect should be most enhanced from appearing simultaneously warm and competent, since only increasing one dimension leaves doubt in the other. Finally, we wanted to explore to what extent discrimination could be compensated for by proving oneself warm and competent. Specifically, will a warm and competent Arab applicant be on equal terms with a cold and incompetent Swedish applicant?

## **A new type of field experiment**

The classical approach to field experiments in the labor market is to match applicants on all aspects except the ones being studied (e.g., Riach & Rich, 2002; M. Carlsson & Rooth, 2007). This yields high statistical power and allows the research to clearly observe, in every single case, if discrimination occurred or not. However, there is one serious drawback of this: generalizability. If the two applicants both have excellent education, decent work experience, play golf and enjoy attending dinner parties, then the level of discrimination observed will be limited to this specific comparison. The question is if discrimination would be the same if the persons contrasted had poor education, excellent work experience, played tennis and preferred mountain hiking in their leisure time. As such, an alternative new approach (M. Carlsson, 2012) to field experiments of hiring discrimination is to not match applicants, but rather randomly apply a large set of different aspects to each job application. Consequently, a single recruiter will receive two (or more) widely different applicants. As such it is impossible to tell if there is any discrimination going on in the specific case. However, since all aspects are randomly applied to the applications we can now, unlike in a correlational study, conclude without any uncertainty, that any systematic differences have the causal explanation that we observed. In other words, this is a way to construct an experiment so that it can be interpreted as a correlational study without having to worry about cause and effect.

The most obvious advantage of this alternative design is that any effects found can be generalized to be robust over a wide range of potentially confounding variables. Specific for the present research, warmth, competence and ethnic discrimination can be demonstrated to be important and robust effects that are not limited to a specific custom-tailored (or arbitrarily chosen) application. Since the point of doing field research is generalizability and ecological validity, this aspect is highly important.

Another aspect that is at the same time a drawback and an advantage is that it is not possible to identify discrimination in the specific case. For example, an employer may have received a very competent and warm golf playing Arab and an incompetent and cold tennis playing Swede. It is impossible to know if it is discrimination (due to ethnicity) or not in the specific case. Although this makes follow-up studies that interview employers practically useless, it is a clear advantage from an ethical perspective. Indeed, this design can demonstrate discrimination as a systematic general problem on a specific labor market, but it cannot point fingers to a specific employer. This is an extremely important ethical advantage, since ethnic hiring discrimination is a felony. Hence, this type of design solves the ethical problem of field experiments by not directly observing any illegal activities made by any individual people, firms or organizations.

The perhaps greatest drawback of this design is that it requires substantial sample sizes. Whereas a match-designed field experiment may make due with hundreds of applications, this design requires several thousands. As such, the present field experiment was conducted in collaboration with researchers in economics with several different intended goals. First of all, the goal was theoretical: to investigate if this type of design differs from the typical design of field experiments. That is, do these large set of randomly assigned variables make a difference in general? This was the focus of the main study that has yet to be published (M. Carlsson, 2012), but preliminary findings show that the design in fact matters. The second aim was to look into specific economics (Rooth, 2011) and social psychological questions (Study III of this thesis). Here we had to take considerable care not to inflate type I error. Although we had over five thousand observations (which is in fact only a subsample since the entire sample also contained female Swedish applicants), the number of interactions is massive. Consequently, we decided not to interact the social psychological and the economics relevant variables. Hence, we do not, for example, look into the interaction of appearing competent and number of years work experience, even if this would have been very interesting indeed.

In sum, the field experiment that is the basis of Study III is necessarily a compromise between being able to answer important research questions, and practical limitations. Still, this study will be important in investigating if a warmth and competence perspective is a valid and useful approach in trying to understand real-life hiring discrimination.

## Method

We manipulated ethnicity of the applicant by randomly assigning an Arabic sounding<sup>1</sup> or a Swedish sounding name. The names have been used in previous research so we were sure that there were no specific name effects. All applicants were male.

Warmth and competence was manipulated through the applicant's personal letter. Here's an example of a person who is warm:

My friends and former colleagues think that I am a warm and social person who gets along great with others, both at work and elsewhere. Also, I think it is important to consider other people's needs, not just money. I have a strong sense of empathy with people who are less fortunate than myself and I do some charity work.

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<sup>1</sup> While it is true that these names are Arabic-sounding, they are also common names among Muslims who are not Arabs (e.g., Indians and Persians). Hence, we cannot be sure exactly what these Arabic-sounding names signals, some may only think of Muslims in general and other of Arab-Muslims in particular.

And one who is cold:

As a person I usually do not sit and keep my opinions to myself but rather say what I think straight out. Some of my former colleagues would probably call me a bit stubborn, but I believe it is important that my point is seen and that the job gets done. And I often prefer to complete my work tasks alone, since then it is easier to concentrate on what you are supposed to do.

This was used to signal high competence:

As regards work I am used to put great effort into it and I always try to do my best. I strive to be precise so that the work does not need to be redone. My old co-workers would probably say that I am a person who always manages to get the job done. In addition, I would describe myself as a hardworking and tenacious person who handles stress well.

While this is for low competence:

Regarding work I really like working but at the same time I think it is important to keep a balance between work and leisure. The best days are the ones when I feel that I have done my share at work and yet have the energy to be active in my spare time. It is not important for me to be the best at work and my colleagues would probably describe me as a pretty relaxed.

These are only examples, as there were three versions of each manipulation (12 paragraphs in total).

We had these paragraphs evaluated by a sample of 84 students (54% men, age 19–35 years, Median age = 23.50) who rated them on warmth and competence scales. The results confirmed that our manipulations had worked and were strong. However, paragraphs that increased warmth also tended to decrease competence, whereas paragraphs that increased competence tended to decrease warmth. This is not surprising, since previous research have shown this compensatory effect on the other dimension. Indeed, Kervyn et al. (2009) has shown that you appear a bit warmer if you appear lazy, and one could certainly interpret the low competence paragraph as lazy. The same study also found meaner people to appear more competent, and sure enough our low warmth paragraphs appear meaner than those with high warmth. Importantly, in the present study, these compensatory effects are quite small compared to the intended effects and should thus be of no threat to the present study.

It is also important to note that our low versions are not entirely incompetent or entirely cold. This is because they had to be realistic. Furthermore, the application



always contained other information that likely moderated these dimensions a bit. For example a person that had the cold manipulation may have gained some warmth from the fact that he (in some cases) enjoyed cooking dinner and playing soccer. Perhaps more importantly, our applicants demonstrated competence in that they had relevant qualifications. For example, a nurse had an exam in nursing, obviously increasing competence, since people who are entirely incompetent would not succeed in higher education. Hence, our manipulations do not create unrealistically cold or warm people, but rather represent reasonable variations people could express in an application. After all, no one would write an application trying to appear entirely incompetent!

The warmth, competence and ethnicity manipulations were randomly assigned along with several other variables (such as previous employments, years of unemployment, time studied abroad, type of leisure activities commonly engaged in, etc.) by means of a computer program and then manually confirmed that the complete application appeared correct before it was sent to the job opening.

5,636 fictitious job applications were sent to vacant job positions in Sweden to a total of 3,325 job openings posted by the Swedish Employment Agency. The jobs were in the following occupational categories: shop sales assistants, cleaners, construction workers, restaurant workers, mechanics, motor-vehicle drivers, accountants, primary school teachers, high school teachers, business sales assistants, computer professionals, and nurses. All applications were sent by e-mail. Applications were sent to openings all over Sweden, although most of the jobs were located in two major cities of Sweden: Stockholm and Gothenburg. Callbacks for interview were received via telephone (voice mailbox) or e-mail. Thus, whether or not an applicant was invited for a job interview constituted our dependent variable. To minimize inconvenience on behalf of the employers, invitations were promptly declined.

## **Results and discussion**

The results show substantial discrimination towards applicants with Arab sounding names. The results also show that both Arab applicants and Swedish applicants benefit from appearing warm and competent. However, there was an interaction suggesting that Arab applicant benefit especially from appearing both warm and competent. Although this three-way interaction is as predicted, it was only marginally significant. We find that the interaction is due to Arab applicants benefiting from both warmth and competence, whereas Swedish applicants appear to only need to increase in either one of these dimensions. Another way to view the results for the Swede is that he needs to disprove both his warmth and competence to have his chances reduced. Importantly, we can also see that gaining only warmth *or* competence provides no (not even marginally significant) increase for the Arab applicant. This is consistent with that the employers doubt both these dimensions because of how Arabs are stereotyped. In essence, an employer that received an Arab

application that appears clearly competent may still doubt their warmth. Likewise an employer who receives an application from an Arab who appears clearly warm may still doubt that applicant's warmth, due to the stereotype.

We also found that there were significant difference between the Arab and the Swede (i.e., discrimination) for all comparisons. The only exception is between the cold and incompetent Swedish applicant and the warm and competent Arab applicant. Even in this case, the Swedish applicant has a slightly higher probability of being invited to a job interview, but this is not a statistical significant difference.

In sum, the results of the present study show that applying a warmth and competence perspective to real-life hiring discrimination is useful. Indeed, it was not enough for the Arab applicant to increase only his warmth or his competence; rather he needed to appear both warm and competent to increase his chances.

# General discussion

The overall aim of the present thesis was to apply a two-dimensional perspective of warmth and competence to two areas that have so far received little attention: implicit stereotypes and discrimination. In doing so, this thesis deals with the highly theoretical questions of whether implicit stereotypes and discrimination can be mixed in terms of warmth and competence, as well as with the applied value of a warmth and competence perspective in the case of real-life hiring discrimination. It also looks into how stereotype content may interact with individuating information, and the possibility that this could reduce discrimination.

## Mixed implicit stereotype content

The first research question to be answered was whether stereotypes could be mixed in terms of warmth and competence. The results of Study I suggest that they can. As measured by the Implicit Association Test, lawyers were found to be associated with more competence, but less warmth, relative to preschool teachers. This is a very important finding. First and foremost, it demonstrates that warmth and competence are not always the results of thought-through processes, but can in fact be automatic and implicit associations. Although not surprising given that previous studies have found warmth and competence judgments to occur rapidly (Willis & Todorov 2006), this finding is far from self-evident given that the primacy of warmth (e.g., Fiske et al., 2007) suggest the possibility of an alternative model where warmth is evaluated first (automatic and implicit) and competence would be introduced later on as a thought-through process. Importantly, the only previous study (Wade and Brewer, 2006) could not separate these two dimensions on the implicit level, suggesting that implicit stereotypes are one-dimensional and that the two-dimensions of warmth and competence are the result of explicit processes. Another important aspect of capturing mixed stereotypes by means of implicit measures is that it rules out that the typical finding of mixed stereotypes is to some extent a result of social desirability, which was a potential confound of previous studies that relied on self-reports alone (e.g., Fiske et al., 2002, Cuddy et al., 2007; Cuddy et al., 2009).

In a way, Study I raises more questions than it answers. Although it demonstrates that implicit stereotype content *can* be mixed, it does not provide any indication whether this is commonplace. The reason for this is that Study I did only

compare two groups (lawyers vs. preschool teachers). In contrast, most studies that have used explicit measures tend to compare several, or dozens, of social groups (e.g., Fiske et al., 2002). Indeed, this is easy to do since explicit measures are simple to administer and take little time to complete. A very time-consuming but important task facing future research is thus to replicate the result of Study I with all the groups that have so far only been tested with explicit measures.

Interestingly, this work has already begun. Rohmer and Louvet (2012) followed up on Study I of this thesis, by investigating implicit and explicit stereotype content of disabled people. Their results are similar to that of Wade and Brewer (2006) in that they found a general valence effect (non-mixed) on the implicit level, but mixed stereotypes on the explicit level. They used the same type of measure as Wade and Brewer (2006) did. Hence, lexical decision task has across two independent studies not shown any evidence of mixed stereotypes, whereas the present thesis dual-IAT approach found clearly mixed implicit stereotypes. Unfortunately, drawing any strong conclusions from this is a bit like comparing apples and oranges, since both the implicit measures used and the groups studied differ. On the one hand, it is well established that IAT is a sensitive measure (Lane et al., 2007) and this may be the reason for an effect in Study I. On the other hand, the result may be because the groups investigated in Study I were not normatively protected. Indeed, they were chosen for this precise reason in order to maximize an effect. Hence, future research should not only systematically study implicit mixed stereotype content towards several groups, but also use a wider array of implicit measures. One potentially good candidate is the SPF (Bar-Anan, et al., 2009) that would allow the researcher to simultaneously test for warmth and competence relatively independent of each other. Another good choice would be AMP (Payne et al., 2005) that is similar in methodology to the measures used in Wade and Brewer (2006) and Rohmer and Louvet (2012), but may prove to be more sensitive.

When replicating the findings of implicit stereotype content it would also be important to look into whether the associations are unconscious. While the IAT certainly *could* be used to capture unconscious associations, it does not by itself prove that the participants lack introspective access to the construct measured. The generally low correlations between implicit and explicit measures (Nosek et al., 2007; Hoffman et al., 2005) could be due to numerous other reasons, such as social desirability, incorporating other aspects, motivation etc. (e.g., the MODE model; Olson & Fazio, 2008). Hence, a low correlation between implicit measures and explicit self-reports cannot by itself prove that people lack introspective access to the construct captured by the implicit measure. On the other hand, if one would unconsciously prime warmth and competence stereotypes, and then measure it (by means of IAT or some other measure) then this aspect could be further strengthened and one would make us more confident in concluding that mixed stereotypes can exist unconsciously and not just be accessed automatically.

Furthermore, future research needs to look into whether the predictive validity of implicit warmth and competence stereotypes is better than that of traditional self-reports. Study I offers some support for this in that ingroup-favoritism was detected on the implicit measure but not on the explicit measure. As such, the limited evidence that does exist suggest that we should perhaps not be so skeptical towards this new implicit measure of warmth and competence stereotypes, but that it may in fact, despite its flaws, already be a good complement that provide information over and beyond what can be derived from self-reports.

It should be emphasized that the other two studies of the present research, also use methods that differ from traditional explicit self-reports. Consequently, there is now considerable support for that a warmth and competence perspective to intergroup bias is valid beyond self-reports of stereotypes (see also Durante et al., 2010; Collange, Fiske & Sanitioso, 2009). Furthermore, basic research in person perception suggests that compensatory answers (e.g., increasing warmth to counteract low competence) in relation to the dimensions may not be a social desirability confound but a natural tendency (Kervyn et al., 2009). For example, a competent person is a bigger threat if cold than an incompetent person, and as such is only rational to attribute lower warmth to that individual, just to be on the safe side. The pilot study in Study III further corroborates this perspective, where this tendency was found towards paragraphs of personal letters. Indeed, it would not make sense to suspect that people compensated their opinions towards *paragraphs* due to social desirability concerns.

## Mixed discrimination

Study II demonstrated that groups with mixed stereotypes could be targets of mixed discrimination as well. Specifically, this study showed that mixed discriminatory judgments towards Greeks, Germans, preschool teachers and lawyers were all consistent with the stereotype content of these groups. Specifically, despite the participants having the right answer that all individuals had performed equally well on the first trial of puzzle solving task or an empathic test, they still estimated that the lawyers and Germans would fare better on the puzzle task, and that preschool teachers and Greeks would fare better on the emphatic test. Hence, mixed discriminatory judgments of individuals were strong enough to prevail even when people had other information to go on.

At the time Study II was conducted there were no other studies that had looked into the possibility of mixed discrimination. This has now changed, thanks to a parallel research effort by Krings, Sczesny and Kluge (2011). They looked into mixed age discrimination by means of a laboratory experiment where students as well as professional hiring managers evaluated the quality of job applications. They also indicated who they would have hired if this had been a real hiring situation. Because

old people are primarily negatively stereotyped as low in competence, and not as low in warmth (e.g., Fiske et al., 2002), the authors reasoned that discrimination should not occur if the work emphasized warmth-related qualities. Yet, they found old people to be discriminated across the board. Hence, this study is somewhat in conflict with the results of Study II in the present thesis.

In a way, it is not the least surprising that there are somewhat conflicting results between the only two studies of mixed discrimination. When we open up the possibility of a two-dimensional approach, the possibilities of interactions with other aspects (e.g., context) multiply. It is thus important to realize that there are several differences between Study II and the study by Krings et al. (2011) that may explain why the results differ. The groups in Study II were specifically chosen in order to be insensitive to express stereotypes about. As such, there is little reason to suspect that social desirability could have biased the reported stereotypes. In contrast, this concern is more important for old people, which was the focus of Krings et al. (2011). Moreover, age discrimination is quite difficult to study because experience, future potential, costs of hiring due to increased salaries and benefits are confounded. Hence, it is also possible that the participants reported mixed stereotypes of old people without adjusting for social desirability, but that this did not translate into mixed discriminatory decisions, simply because there were other factors in these decisions that made the mixed judgments matter less. Still, it should be noted that the authors of that study did an admirable job trying to circumvent confounding issues, and provided a very realistic manipulation of whether the occupation was warmth or competence oriented. As such, their results should be taken seriously.

The conflicting results of Study II and Krings et al (2011) strongly point to that it is important to look into these matters in future studies. Because it is hard to pinpoint if the inconsistency between stereotypes and behavioral outcome in Krings et al. (2011) is due to issues with how the stereotypes were measured (e.g., social desirability), or with the behavioral outcomes, it is important to consider both these aspects in future research. In doing so, future studies would do well to also take advantage of the opportunity to predict this (possibly mixed) discrimination by means of implicit and explicit measures of warmth and competence stereotypes.

## Warmth and competence in real-life hiring discrimination

Study III took a highly applied approach by studying real-life hiring discrimination. The benefits of this are that social desirability concerns as well as other aspects of knowing that you are part of a study are removed. We are thus able to see how people truly act towards ethnic minorities in the labor market and how this interacts with individuating information regarding warmth and competence.

Recall that the design was to manipulate warmth and competence appearance in the personal letter, and to interact this with whether the applicant had an Arabic sounding, or a Swedish sounding name. As predicted, the Arab applicant received considerable fewer invitations to job interview than the Swedish applicant, and also had to prove both his warmth and his competence in order to increase his chances of being called to an interview. Especially striking is the finding that manipulations of warmth and competence combined are worth almost as much as ethnicity in terms of increased chances of being called to an interview. This makes perfect sense to the extent that it is the uncertainty of warmth and competence that is the driving force of discrimination in the labor market. Note, however, that it is not correct to say that increasing warmth and competence in the personal letter removes discrimination. While there is a moderating effect of individuating information, a warm and competent Swede still fares better than a warm and competent Arab. Hence, warmth and competence manipulations of the personal letter are not enough to eliminate discrimination entirely.

It should be emphasized that this study only offers indirect evidence for that it is the warmth and competence stereotype content that is behind the discrimination. In principle, there could be other unobserved effects that simply happen to be of the same strength as warmth and competence. For example, the Arabs may be target of an emotional prejudice that reduces the chance of being called to an interview, and warmth and competence may make up for this. That is, the employers may have a general (not warmth or competence-related) negative association of Arabs, but upon learning that they are warm and competent, this general negative association is countered. Yet, this alternative explanation seems highly unlikely, especially because of the interaction that Arab applicants had to make up both warmth and competence in order to improve their chances, whereas the Swede had to disprove both his competence and his warmth in order to have his chances reduced. Hence, the results are in a very specific pattern consistent with a direct effect of stereotypes, similar to statistical discrimination but based on (likely) inaccurate stereotypes, rather than any objective statistical data. Still, this type of experiment should be replicated in the lab to confirm that it is in fact the increased certainty of warmth and competence that mediates this effect.

Another important question for future research is to investigate how individuating information in terms of warmth and competence interacts with mixed stereotypes. It seems reasonable that groups with mixed stereotypes would primarily need to prove themselves in the dimension they are supposedly lacking in. Hence, a natural next step for both Study II and Study III is a hiring experiment that contrasts groups with mixed stereotypes. Perhaps a hiring experiment that compares Greeks and Germans, or young people with old people. Ideally, this type of field experiment should be designed so that the researchers will be able to measure the explicit and implicit stereotypes of the employers, in order to investigate which has the highest predictive value.

A limitation of Study III is that we did not attempt to investigate an interaction between the two dimensions and different occupations. Doing so could potentially have yielded interesting result, because one could assume that the importance of warmth and competence differs for different types of occupations. It is especially important given that Krings et al. (2011) found that warmth and competence stereotypes did not interact with different types of occupations. There are several reasons for not looking into this interaction in Study III, however. First, although plausible, it is not easy to compare different occupations based on their warmth and competence requirements. One reason for this is that the scales of which competence and warmth are evaluated are likely to differ. This is because warmth and competence is already being assessed in relation to the work at hand when the employer makes the decision. Hence, a recruiter who is looking for a nurse or for a construction worker will look for different aspects of competence. But so would someone who looks for a cleaner. Hence, it does not make sense to conclude that it would be less important to appear competent when applying to work as a cleaner than as a nurse. It is possible that there are larger differences regarding warmth, for example that a job with many social contacts would have a higher importance for this than others, but shifting standards may eradicate any such difference completely.

Furthermore, occupations differ in many ways that make them hard to contrast. For example, while it is true that cleaning is less social than nursing (and thus that warmth should matter less) there are many other differences between these occupations making a comparison quite meaningless. Rather, if we wanted to look into this interaction we would fare better with a laboratory experiment that could directly manipulate how much social contacts are necessary in the job, without confounding it with other aspects. Indeed, as mentioned in the introduction, a field experiment has to make certain compromises and sacrifices compared to a laboratory experiment. Hence, future laboratory based studies would do well to continue the work of Krings et al. (2011) in investigating how the two dimensions interact with different types of occupations.

## How warmth and competence relate to reducing discrimination

What this thesis has shown is that it matters considerably whether groups are stereotyped as altogether bad or in a mixed way. It seems natural that this would also apply in reducing discrimination. The most obvious aspect is that discrimination may not be reduced if we only focus on one dimension. Arab applicants may work hard to appear competent, but that may not help them if they cannot also prove themselves warm, as found in Study III of the present thesis. Unfortunately, it was not the case



that warmth and competence individuating information eliminated discrimination. The Arab applicants were, in fact, discriminated at all times. However, their chances of getting a job interview improved considerably by appearing warm and competent at the same time. Hence, even if individuating information may not be able to remove discrimination, it may reduce the actual impact of not getting a job.

Another aspect is that people should become aware of the role of warmth and competence in discrimination. Indeed, this is a subtle form of discrimination. While people may realize that they can discriminate Arabs because of negative stereotypes and attitudes, they may not realize that they would discriminate groups that they actually like (e.g., old people, housewives) because of their stereotyped low competence. Moreover, even if it balances out in the end if you are sometimes discriminated and sometimes favored, this is not the same as being treated as an individual.

The results of Study III may seem quite depressing in that an Arab applicant who is warm and competent fares equal to a cold and incompetent Swedish applicant. On the other hand, it suggests that the opportunities minorities have in the labor market are not static. Indeed, these two quite simple modifications to the application resulted in a 40% increase in job interviews for the Arab applicants. While I am not suggesting that minorities should simply try harder, we see that there is hope for individuating information to come through. If we can find such strong individuating effects on something as simple as a personal letter that people could easily fake in order to *appear* warm and competent, then there is good hope for that discrimination could be reduced if diagnostic individuating information can be conveyed. While Study II does, unfortunately, suggest that discrimination can prevail even when there is solid objective information to rely on, it seems reasonable to assume that if hiring managers start to rely on more objective diagnostic information, then this could reduce discrimination. However, if this objective information is only in regard to competence, then it will not help group's stereotyped as lacking warmth. As such, an important aspect of this two-dimensional perspective is that any effort to decrease discrimination will do well to consider the role of both warmth and competence.

## Ethical considerations

The study of intergroup bias is a sensitive topic, and especially so in the case of labor market discrimination. Furthermore, because people typically do not want to appear biased (e.g., Greenwald & Banaji, 1995), some level of deception is necessary when studying these phenomena. Because of these two reasons, there were several ethical challenges in the research that this thesis is based on.

Study I and II focused on non-sensitive groups, decreasing the problem of sensitive topics. Study I did not involve deception, but Study II did, although the participants were thoroughly debriefed afterwards, and there were no reason to

suspect that any of the participants would be hurt in any way by our deception. Importantly, in both these studies, all participants were completely anonymous. In sum, the ethical problems with these two studies can be considered minor, especially if contrasted to the importance of studying stereotypes and discrimination.

The ethical problems of the field experiment in Study III are more complicated. This study involves deception and the participants cannot provide informed consent, since they do not even know that they are being observed. Also, for obvious reasons, the firms are not anonymous, since we could not avoid learning what the outcome of a job application to a specific firm was. Except for this, the data was of course handled in such a way that it is not possible to identify any specific firms afterwards. In other words, the study is confidential.

Our observation that a certain application did not receive an interview is, in fact, not particularly sensitive in itself because of the design of the study. Indeed, we cannot know in the individual case if the applicant was discriminated or not: he may simply have been outcompeted by better applicants. Hence, we did *not* collect data on individual firms discriminating or not, which is the typical case of field experiments of hiring discrimination, but only data on whether the labor market *in general* is discriminating. Also, there is little reason to believe that any employer would feel bad for discriminating, since there are so many alternative reasons for why he or she did not choose the Arab applicant in that specific case. Hence, any employees who had second thoughts about their actions might rightfully shrug this off by focusing on other aspects of the CV that may have mediated their decision not to invite the applicant to an interview. This would not have been the case in a matched CV design where the employer might realize his or her wrongdoings.

Finally, the inconveniences of our observations are minimal. After all, people often apply for jobs without having real intentions to go through with it, and we made special effort in trying to promptly decline all job offerings. In sum, although there are some ethical considerations in regards to Study III, these ethical aspects appear reasonable when contrasted against the important goal of identifying real-life hiring discrimination of ethnic minorities, and the mechanisms behind it.

## Overall implications of the present thesis and conclusions

The present thesis has shown that a two-dimensional warmth and competence perspective is valid not only for explicit, but also for implicit stereotypes (Study I), that mixed stereotypes have the unique consequences that they may lead to mixed discrimination (Study II), that stereotype content interacts with individuating information (Study III), and that a warmth and competence perspective can be useful in the applied context of real-life hiring discrimination (Study III).

Prior to the findings of the present thesis, a warmth and competence perspective could conceivably have been dismissed as a special but minor case, perhaps even as some kind of academic nitpicking. The basis for such dismissal would be due to the reliance of self-reports, and the lack of unique consequences. It is my hope that this thesis will contribute in changing this. Researchers looking into implicit stereotypes cannot ignore the possibility of mixed stereotypes, because that could in some cases lead to misleading results, with the researcher incorrectly concluding that a group is favored, or disfavored, somewhat haphazardly. Indeed, both may equally true, depending on the perspective taken. The same would be true in the case of discrimination. It is easy to imagine large amounts of time and money being invested in projects that look into if groups are discriminated, only to end up with a null result. Indeed, this would likely be the case if we were to conduct a field experiment comparing Greeks with Germans, without considering any interactions with warmth and competence. However, this null result would be a mirage, resulting from a too blunt instrument of observation, since these groups are both discriminated and favored, depending on whether warmth or competence is in focus.

If we take a step back and look at how intergroup bias has been studied in the past decade, we can see that there are several different research traditions that are parallel to each other and with little communication between them. First, we have the classical one-dimensional approach that has turned its focus from explicit self-reports to the new implicit measures (e.g., Greenwald & Banaji, 1995; Nosek et al., 2007). Second, we have a warmth and competence perspective that had yet to implement these new implicit measures (e.g., Fiske et al., 2002). Last, but not least, there is a rich tradition on research on statistical discrimination in economics (Phelps, 1972). My hope is that this thesis has brought these perspectives closer together. Study I demonstrates that the warmth and competence literature can make use of implicit measures, as well as that research into implicit stereotypes may do well to take a warmth and competence perspective. Furthermore, Study II and III suggest that not only do economists have something to learn by a warmth and competence perspective, but social psychologists may equally benefit from a perspective where not all discrimination is based on emotional prejudice, but rather on a desire to gain information in order to make a good rational decision. Indeed, it is quite different to discriminate people because you do not like them, or because you are simply trying your best but have access to biased information (i.e., stereotypes).

In conclusion, although we still do not have a complete understanding of implicit and explicit stereotypes and discrimination, the present thesis shows that much is to be gained from viewing these phenomena from a two-dimensional warmth and competence perspective.

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# Swedish summary

## Betydelsen av värme och kompetens för implicita stereotyper och diskriminering

Ett väl etablerat fynd inom personbedömningsforskning är att vi människor bedömer varandra på ett mer nyanserat sätt än enbart en endimensionell skala (bra-dålig). Istället använder vi oss av två grundläggande dimensioner för personbedömningar. Den första dimensionen (värme) ger oss svaret på andra människors avsikter (t.ex. vänligt eller fientligt inställda till oss). Den andra dimensionen (kompetens) handlar istället om människors förmåga att genomföra sina avsikter. Enligt The Stereotype Content Model (SCM; Fiske, Cuddy, Glick & Xu, 2002) är dessa två dimensioner inte bara relevanta för personbedömningar utan också för bias mellan grupper (stereotyper, fördomar och diskriminering). Vissa grupper har stereotyper som innefattar att de ligger högt på både värme och kompetens (till exempel majoritetsgruppen i ett samhälle eller ens egen in-grupp), medan andra grupper stereotyperas som varken varma eller kompetenta (till exempel vissa etniska minoriteter). Det finns också grupper som har en blandad uppsättning av stereotyper: hög värme men låg kompetens (t.ex. greker) eller låg värme men hög kompetens (t.ex. tyskar).

Det finns sedan tidigare omfattande forskning som stödjer SCM. Men dessa studier har nästan uteslutande fokuserat på självrapporterade stereotyper och fördomar. Syftet med avhandlingen är att bredda detta forskningsfält genom att istället fokusera på två utforskade områden där ett två-dimensionellt värme och kompetensperspektiv kan visa sig användbart: implicita stereotyper och diskriminering.

**Delstudie 1** visar att det är möjligt att mäta blandade implicita stereotyper (t.ex. hög på värme men låg på kompetens) med hjälp av implicita associationstester (Greenwald, McGhee & Schwartz, 1998). Ett preliminärt fynd är att det är fördelaktigt att undersöka blandade implicita stereotyper, eftersom de implicita associationstesterna, till skillnad från självrapporteringarna, hade precision nog att upptäcka ingrupsfavoritism.

**Delstudie 2** visar att blandade stereotyper i förlängningen innebär blandad diskriminering. Två experiment visade att grupper stereotyperade som höga på värme men låga på kompetens (greker och förskollärare) blev diskriminerade i samband med

en uppgift där kompetens i form av problemlösningsfråga var i fokus, samtidigt som de blev favoriserade i ett sammanhang där empati (värme) var i fokus. Två grupper (tyskar och advokater) stereotyperade som låga på värme men höga på kompetens blev tvärtemot favoriserade på problemlösningsuppgiften och diskriminerade när fokus var på empati. Det viktigaste resultatet från den här delstudien är att ett en-dimensionellt perspektiv inte alls tydde på diskriminering. Anledningen är att grupperna behandlades lika om man slog ihop värme och kompetens till ett genomsnitt.

**Delstudie 3** undersökte diskriminering i en verklig kontext genom ett fältexperiment på arbetsmarknaden. 5636 påhittade ansökningar skickades ut som svar på platsannonser. Genom att experimentellt manipulera om den sökande hade ett arabisk-, eller svenskklingande namn, och om personen framställde sig som högt på värme och/eller kompetens i sitt personliga brev, kunde vi undersöka hur individuerande information kring värme och kompetens interagerade med etnicitet. Vi fann omfattande diskriminering utifrån etnicitet; sökande med arabiskt klingande namn fick komma på betydligt färre intervjuer. Helt i linje med deras stereotyper (låg på både värme och kompetens) var sökande med arabisk klingande namn tvungna att presentera sig som både högt på värme och högt på kompetens i sitt personliga brev, för att förbättra sina chanser att få komma på arbetsintervju. Ett intressant fynd är att en sökande med arabisk klingande namn måste framställa sig som både varmare och mer kompetent än sökande med svenskklingande namn för att ha (nästan) samma chanser att få komma på arbetsintervju.

Avhandlingens slutsats är att det finns stora fördelar med att undersöka bias mellan grupper från ett tvådimensionellt perspektiv, oavsett om fokus ligger på implicita stereotyper eller på diskriminering. Om man studerar implicita stereotyper utan att ta hänsyn till värme och kompetens, riskerar man att godtyckligt dra slutsatsen att en grupp är negativt eller positivt stereotyperad när gruppen i själva verket har en blandad stereotyp (t.ex. varm men inte kompetent). Samma sak gäller för diskriminering som också kan vara blandad utifrån värme och kompetens. Även när vi undersöker grupper som tydligt är stereotyperade som låga på både värme och kompetens är det viktigt att ha ett tvådimensionellt perspektiv. Det räckte inte för en sökande med ett arabisk klingande namn att framställa sig som varm *eller* kompetent för att öka sina chanser att få en jobbintervju; han var tvungen att framstå som både och. Med andra ord framstår bias mellan grupper som ett alltför komplext problem för att kunna reduceras till enbart positiva eller negativa värderingar av grupper.