

**Making Sense of Negative Outcomes: The Role of Perceived
Attributional Stability**

Submitted by Melika Janbakhsh to the University of Exeter

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Abstract

When receiving a negative outcome (e.g., rejection in a job interview), people tend to attribute it to different causes. For members of stigmatised groups, discrimination is a plausible cause for a negative outcome. However, because discrimination has become relatively subtle (Ellemers & Barreto, 2015), members of stigmatised groups always live in an attributional ambiguity where they constantly wonder whether discrimination was the cause of the received negative outcome. Some researchers argue that this attributional ambiguity leads members of stigmatised groups to make attributions to discrimination. In doing so, individuals would protect themselves by discounting their own role in the negative outcome they received. In other words, in order to protect their sense of competence, members of stigmatised groups prefer to make attributions to discrimination rather than their lack of deservingness (i.e., attributions to lack of ability; Crocker & Major, 1989; Major, Kaiser, & McCoy, 2003). On the other hand, other researchers argue that making attributions to discrimination is not necessarily self-protective as perceived discrimination can have negative consequences for individuals. It has been suggested that attributional stability plays a key role in determining the extent to which attributions to discrimination and to lack of ability are perceived as a threat to individuals (Branscombe & Schmitt, & Harvey, 1999; Schmitt & Branscombe, 2002; Dweck & Leggett, 1988). In three studies, I examined the extent to which attributions to discrimination and to lack of ability are threatening/challenging as a function of stability of those attributions. Threat and challenge were measured both via self-reported data and cardiovascular markers. The results confirmed the role of attributional stability in perceived threat/challenge. In addition, in another study I examined whether attributional stability influences the extent to which attributions to discrimination and to lack of ability are made. However, the results of this study did not confirm my expectations, instead, participants consistently made more attributions to their lack of ability irrespective of information about attributional stability.

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1 Introduction

When the 14th Amendment, in 1868, took place, Black people born or naturalized in the United States gained the right to be American citizens. Up to that point, even if they were not slaves, or in other words if they were “free”, Black Americans were not considered citizens and consequently, were not entitled to human, social, political, and civil rights (Rierson, 1994). However, this gap between White and Black people still exist. For example, Black applicants are 14% less likely to be invited to a job interview compared to White applicants who are otherwise equivalent to their Black peers (Nunley, Pugh, Romero, & Seals, 2014).

This disadvantage is not limited to Black people. Instead, individuals who belong to some social groups tend to achieve far less than others. Until mid-19th century, both in the United States and in the UK, married women had a social status which was only moderately better than that of a slave. For example, they were not allowed to own property, or be part of a legal contract, or even to make a will (Rierson, 1994). A century after the right of suffrage in the UK in 1918 was gained, women are still not treated equally to their male peers. For example, women are still under-represented in many areas. In 2010, women in the UK achieved fewer than 20% professorship positions (“Fewer than 1 in 5 UK University Professors Are Female”, 2012). A study by Diversity VC (a non-profit organisation), showed that in 2016 only 13% partner/decision makers and 27% of employees at the UK venture capital firms were women. In addition, 48% of the firms do not have women in their investment team (Women in the UK venture Capital, 2017). Research shows that women and members of stigmatised groups are more likely to take part-time (Connor, Tyers, Modood, & Hilage, 2004) or non-graduate level jobs (Moreau & Leathwood, 2007). This gap remains even among those with the first-class honours degree (Smetherham, 2004). Although the number of female graduates raised to 36% and more than half in the higher education over the past 40 years (DiPrete &

Buchmann, 2013), women are still under-represented in the later stages and the wage gap exist between men and women employees (Kulich, Trojanowski, Ryan, Haslam, & Renneboog, 2011). Some researchers discuss that this underrepresentation, especially in higher levels of management, is the major reasons for gender inequality (Wright, Baxter, & Birkelund, 1995). This inequality can create a gap in achievement between members of disadvantaged and advantaged groups. Although according to Anderson, Medrich, and Fowler (2007), defining achievement gap is much harder than it seems, some sources define achievement gap as a result of unequal distribution of benefits among members of different social groups (“Achievement gap”, 2013). That is, not having equal access to resources can influence achievement outcomes among members of different social groups.

Differences in achievement gap can be the results of multiple causes including direct and indirect effects of discriminatory treatment (Neblett, Philip, Cogburn, & Sellers, 2006; Van Den Bergh, Denssen, Hornstra, Voeten, & Holland, 2010), endorsement of gender roles (Judge & Livingstone, 2008), and women’s own choices (Daymont & Andrisani, 1984; Eccles, 1994). However, one important psychological factor shaping this achievement gap across different social groups is the attribution individuals make for setbacks, or negative outcomes. When receiving a negative outcome (for example, rejection in a job interview, or failure during educational trajectory) individuals have different ways to cope with it and try to find the cause of this setback. That is, they attribute this negative outcome to a variety of causes. These causal attributions especially for negative outcomes are spontaneous and happen automatically (Wong & Weiner, 1981). By doing so, individuals might be able to reduce the negative effects of setbacks on their psychological wellbeing (Weiner, 1985; see also Crocker & Major, 1989). However, attributions for negative outcomes also play an important role in shaping motivation and subsequent achievement. Specifically, attributions can influence future action by reducing individuals’ motivation (Weiner, 1985) or undermining individuals’ performance on a

subsequent task (Dweck, Hong, & Chiu, 1993). Attributions are also crucial determinants of how individuals cope with unfair treatment (Allport, 1979). Indeed, the very perception that a specific treatment is unfair implies an attribution, or at least a deflection of personal responsibility for the outcome received (Major, Kaiser, & McCoy, 2003). That is, attributions that people make for a negative outcome play an important role in how people respond to unjust treatment. These, in turn, can impact emotions and the extent to which members of disadvantaged groups feel threatened or challenged by a negative outcome.

How achievement gaps emerge and are perpetuated is a very broad area that researchers, specifically in social psychology, dedicate attention to given its role in perpetuating social inequalities. However, to understand achievement gaps across social groups, it is important to improve our understanding of the role of attributions and how they influence motivation and performance. Although evidence suggests that these attributions may play an important role in determining whether members of different social groups can employ strategies which help them to succeed in the forthcoming tasks, the literature in this area is riddled with untested inferences and assumptions. Briefly stated, research in this area makes strong assumptions regarding the characteristics of different types of attributions, what attributions are likely to be experienced as threatening, the extent to which each attribution is made, and how this affects motivation and performance. In the work reported in this thesis, I aimed to directly address these assumptions.

1.1 Overview of the dissertation

Understanding when the attributions that members of disadvantaged groups make for a negative outcome are experienced as threatening as a function of stability of those attributions is the central goal of my PhD. In this dissertation, I focus on women since gender discrimination is still highly pervasive across a variety of contexts, rendering attributions to discrimination plausible.

I focus on variables that might shape individuals' attributions for a negative outcome, such as the perceived stability of those attributions. Further, I measure experiences of threat and challenge both psychologically and physiologically as an outcome of the attribution process. In doing so, I aim to contribute to improved understanding of processes involving attributions, emotions, physiological responses, and gender discrimination.

In this research, I consider two views about attributions to discrimination that have dominated recent understandings of the role of attributions among members of disadvantaged groups— the idea that attributions to discrimination can be self-protective (Crocker & Major, 1998) and the idea that attributions to discrimination can be highly threatening when they are perceived to be pervasive, given that they have implications for an individual's identity (Schmitt & Branscombe 2002). By combining these two views with the implicit theory of ability (Dweck & Legget, 1988), I directly test the threatening effects of attributions to discrimination and to lack of ability as a function of the stability of those attributions.

In Chapter 2, I start by defining attributions, and then review the literature on attributions and social stigma and explore the effects of attributions on individuals' well-being. Through this, I identify existing gaps in the literature and propose that the perceived stability of attributions can play a crucial role in which attributions are experienced as threatening and consequently not made. In order to do so, I conducted one pilot study and four experiments, which will be discussed in four empirical chapters (Chapters 4, 5, 6 and 7).

As mentioned, threat and challenge are measured through physiological markers as well as self-reported data. In chapter 3, I introduce biopsychosocial model of threat and challenge. Through this, I review what cardiovascular markers of motivational states of threat and challenge are, how they are measured, and the literature around social stigma and cardiovascular markers of threat and challenge.

In Chapter 4, I examine people's lay theories about attributions. I report a study that aimed to uncover, dimensions of attributions to discrimination and to lack of ability and test the extent to which people see these attributions as internal vs. external, stable vs. unstable, and controllable vs. uncontrollable. This study served as a basis for the next three experiments. In addition, I tested whether beliefs in a just world moderates people's lay theories about attributions (e.g., O'Brien & Major, 2005).

In chapter 5, I investigate when attributions are perceived to be threatening as a function of their stability. I explored these through two separate experiments, one focusing on attributions to gender discrimination and another one on attributions to lack of ability. I hypothesised that the more stable the attributions are perceived to be, the more threat-related experiences they elicit. However, when attributions are seen as unstable, they can lead to reduced feelings of threat or even increased feelings of challenge.

In chapter 6, I directly compare the role of attributional stability for the two types of attributions under consideration. I adjusted my research paradigm to allow for a direct comparison of the effects of perceived stability of attributions to discrimination and to lack of ability. In this chapter, I report a study in which I manipulated stability of attributions to lack of ability and stability of attributions to discrimination, in one study. In addition, in this study I added two control conditions, one for each attribution, which enabled me to compare the effects of the stability manipulation with what happens when there is no information regarding the stability of attributions.

In chapter 7, I examine the extent to which members of disadvantaged groups actually make an attribution to lack of ability or to discrimination as a function of stability of those attributions. For this study, I proposed that targets are less likely to make attributions that elicit feelings of threat. I report data from a study in which stability of attributions to lack of ability

and to discrimination were orthogonally manipulated and the extent to which different attributions were made was examined.

In chapter 8, I provide an overview and discussion of the findings of this project, integrating these with previous research in the literature, highlighting how these findings contribute to the literature, and the broader implications of this research. I also discuss how my conceptualization of stability changed throughout this research and identify some limitations and directions for further research in this area.

2 Literature review

Discrimination is always a possible explanation for setbacks among members of stigmatised groups. The fact that most discrimination is relatively subtle means that members of stigmatised groups live in a permanent state of attributional ambiguity where they constantly wonder whether discrimination is the cause of their negative outcomes. Some researchers argue that this attributional ambiguity leads members of stigmatised groups to seize the chance to make attributions to discrimination and thereby discount their role in the setbacks they receive. This is suggested to protect their sense of competence and might even mean that members of stigmatized groups prefer to make attributions to discrimination rather than to their lack of deservingness (i.e., attributions to lack of ability; Crocker & Major, 1989). On the other hand, other research illustrates that perceived discrimination has negative consequences for health and wellbeing and that, thus, people are not so eager to make attributions to discrimination. Attributional stability has been proposed to have a key role in the extent to which attributions to discrimination and to lack of ability are perceived as threatening (Schmitt & Branscombe, 2002; Dweck & Leggett, 1988). In this thesis, I aimed to discover whether or not attributional stability affects the extent to which attributions to discrimination and to lack of ability are perceived and experienced as threatening/challenging. In addition, I aimed to find out whether attributional stability influences the extent to which these attributions are actually made. In this chapter, I will review the literature around attributions, stigma, and stability of attributions to discrimination and to lack of ability and how these might influence the process of making attributions.

2.1 Attributions: Their Conceptualization, dimensions, and impact

Imagine you are taking part in a job interview. If you succeed and get the position, it might be important for you to know what caused this success in order to employ similar

strategies on future occasions. Likewise, if you are rejected in the interview, you would probably also try to find what caused this rejection in order to prevent negative outcomes in the future. You might think that this rejection was because of your bad luck, or that you did not make enough effort. You might even think this was due to lack of ability in that specific area, or you might consider that you were discriminated against because of a particular aspect of your identity, like your gender, race, or other. These attributions are lay explanations that are not exact or scientific but are instead perceptions of what might have led to a specific outcome. Attributions are defined as perceptions of a cause of an event (Kelley & Michela, 1980). Kelley (1971) believes that an attributor is a "seeker after knowledge; his [/her] latent goal in attaining knowledge is that of effective management of himself and his [/her] environment" (p. 22).

It is, however, important to note that attributions are not merely explanations, they can be a way of coping with an outcome. For example, Weiner (1985) proposed that individuals are motivated to make self-serving attributions. Therefore, when the outcome is positive, individuals are likely to take the responsibility and attribute the outcome to internal factors such as special talent and hard work, which can enhance (McFarland & Ross, 1982). On the other hand, when the outcome is negative individuals are more likely to attribute the outcome to external causes, such as bad luck or another person's behaviour, which, in turn, limits the negative impact of the negative outcome on the self-concept (Hoyt, Aguilar, Kaiser, Blascovich, & Lee, 2007; Taylor & Brown, 1988).

In addition, the attributions that people make for a negative outcome can have various consequences for individuals. For instance, attributions can influence future action by affecting individuals' motivation (Weiner, 1985). That is, if one receives a negative outcome, the attributions that they make for this negative outcome might diminish their motivation to deal with the following task and eventually impair future action (Dweck, Hong, & Chiu, 1993). That is, a setback can elicit helpless responses in some individuals which can reduce motivation and

impair performance on a subsequent task (Dweck, Chiu, & Hong, 1995). This is likely to be the case, for example, when the attribution made refers to something that will not change, since then the result of a new attempt is likely to remain unchanged as well. The impact of attributions is determined by how they are perceived along specific dimensions. Classical approaches to attributions classify them according to three dimensions: Locus of causality, stability, and controllability. Rotter (1966) initially defined two types of causes—internal versus external (locus). For example, ability is often perceived as internal, whereas, luck is most often perceived as external. Importantly, the issue is not whether a particular cause is objectively internal or external, but whether it is perceived as such. In 1971, Weiner, Frieze, Kukla, Reed, Rest, and Rosenbaum proposed a second dimension for attributions—stability. This dimension was proposed to be orthogonal to locus of causality, that is, both internal and external attributions can be perceived as stable or as unstable. For example, effort can be perceived as internal and unstable, whereas task difficulty can be perceived as external and stable (if referring to the same task). Following this, Weiner (1979; 1985) argued for a third dimension—controllability—which is was proposed to be orthogonal to both locus and stability. Controllability reflects the fact that although some causes, such as effort, are often perceived as internal and unstable, individuals can also control the amount of effort they make, whereas physical health is internal and unstable but harder to control.

While the effects of attributions on motivation and performance are dependent on their perceived characteristics, their role and effects have often been examined in achievement-related contexts. For example, attributional stability was found to influence expectations of task success (Valle & Frieze, 1976; Weiner, 1985). This, in turn, can affect motivation on a subsequent task. For instance, if someone believes that their lack of ability was the cause of failure in a task and they perceive ability to be stable and uncontrollable, their expectations of success for a future similar task are likely to be lowered. However, if someone believes that

they failed because they did not make enough effort and that effort is unstable and controllable (i.e., it is in their hands to decide to make more effort), then they are likely to have greater expectations of success in a future task, as long as they are motivated to succeed. In this latter case, one is more likely to be motivated to engage with the task than in the former example.

Whether attributions are seen as internal/external, (un)stable, and (un)controllable can also influence the emotions that result from attributional activity. For example, internal, unstable, and controllable attributions of negative outcomes are associated with self-blame, so they can elicit feelings of guilt, whereas external attributions are more likely to evoke anger (Neumann, 2000). Anger is also known to be associated with stable and controllable attributions, since these are perceived as obstacles that are unlikely to change even if we have control over them (Weiner, Graham, & Chandler, 1982). Attributions to stable and uncontrollable factors can also related with feeling of shame, given that they imply that one cannot do better on future occasions and has no control over whether or not that is the case (Harvey, Martinko, & Borkowski, 2017).

Although there has been ample research on the types of attributions people make and the ways in which they differ from each other, evidence regarding which attributions are likely to be most threatening and when, and the consequences this might have on whether or not they are made, is rather scarce. In this research, I aim to examine how some of the characteristics of attributions, more specifically the stability of attributions, affect the extent to which these are experienced as threatening, as well as the extent to which these are actually made among members of disadvantaged groups. Before elaborating on this, however, I review existing knowledge on how attributions affect members of disadvantaged groups, the key debate that has dominated this area of research, and identify the precise gaps that my research aims to fill.

2.2 Stigma and attributions among members of disadvantaged groups

Social stigma is a phenomenon that affects members of certain social groups. Goffman (1963) defined social stigma as “an attribute that is deeply discrediting” (p. 3). In other words, social stigma refers to an attribute that is devalued in society and therefore sets individuals apart from the mainstream (Major & O’Brien, 2005). Stigma can affect members of stigmatized group directly through the discriminatory behaviour of others (Major & O’Brien, 2005). In other words, members of socially stigmatized groups often encounter unfair treatment in their everyday lives that can be attributed to discrimination affecting various aspects of their lives, such as education, housing, employment, income, and medical care (Braddock & McPartland, 1987; Cash, Gillen, & Burns, 1977; Neckerman & Kirschenman, 1991; Treiman & Hartmann, 1981). Discrimination also negatively affects individuals’ physical health (Allison, 1998; Clark, Anderson, Clark, & Williams, 1999). Negative effects of discrimination on health and problems in accessing medical health can also result in early mortality among members of stigmatised groups (Williams, 1999). Researchers define discrimination as illegitimate treatment that is related to the individuals’ group membership (Jetten, Schmitt, & Branscombe, 2012). In order to attribute an event to discrimination, two elements should be present. First, individuals should recognise that they have received a treatment based on their group membership or social identity. Second, this treatment has to be perceived as unfair (Major & Dover, 2016).

Discrimination is a plausible attribution for members of disadvantaged groups, and more so than for members of groups that are not devalued in society (Crocker & Major, 1989; Mendes, McCoy, Major, & Blascovich, 2008). Indeed, discrimination against a range of social groups such as ethnic minorities, sexual minorities, individuals with a disability, and women is pervasive across a variety of national contexts and domains (Foster, 2009; McCluskey, 1988; Pizer, Mallory, Sears, & Hunter, 2012; Stroebe, Dovidio, Barreto, Ellemers, & John,

2011). However, discrimination is often rather subtle, making it hard to detect. Indeed, research has shown that it is actually quite hard to make attributions to discrimination (Barreto, 2014; Deitch, Barsky, Butz, Chan, Brief, & Bradley, 2003; Ellemers & Barreto, 2015).

Researchers in this area have debated whether or not targets of discrimination are motivated to make attributions to discrimination to protect themselves. One side of this debate argues that attributions to discrimination can protect the individual from feeling incompetent, whereas another side of this debate defends that attributions to discrimination are inherently damaging to the self-concept. Crocker and Major (1989) coined the term “attributional ambiguity” to refer to the fact that members of minority groups constantly wonder whether the negative outcomes they receive are due to discrimination, or to alternative causes, such as bad luck or lack of ability (Crocker & Major, 1989). Attributional ambiguity is created when there are various plausible causes for an event (Snyder, Kleck, Strenta, Mentzer, 1979). For members of stigmatized groups, discrimination is often a plausible attribution, adding ambiguity to situations that for members of non-stigmatized groups might be relatively unambiguous. Attributional ambiguity can be situational, i.e., created by circumstances, but it can also be chronic, when there are plausible causes that are present across contexts. This distinction does, however, become less useful when we speak about members of severely devalued groups. Being a member of a devalued group (which is, in itself, both contextual and chronic, see Barreto, 2014) means that prejudice/discrimination are often a plausible cause for negative outcomes, so attributional ambiguity is a relatively chronic situation. However, even then, there are contexts where discrimination is more or less expected. So, while it is helpful to distinguish between situational and chronic attributional ambiguity (and stigma), my focus in this thesis is on the coming together of the two.

Some researchers have argued that this ambiguity provides members of minority groups with the opportunity to deflect personal responsibility, or blame, for the negative outcome

received (Major, Kaiser, & McCoy, 2003; Major & O'Brien, 2005). On this note, the discounting hypothesis posits that attributing a negative outcome to discrimination is self-serving as it can shift the blame away from the self and towards prejudiced others (Crocker & Major, 1989; Major & O'Brien, 2005; Major et al., 2003). This protects the target's self-esteem by discounting their own role (e.g., lack of ability) in causing the negative outcome. By contrast, attributing a negative outcome to lack of ability is highly threatening for the self as it involves self-blame. Attributions of negative outcomes to lack of ability portray the self as incompetent, which is highly threatening for an individual's identity, given the importance of competence in most societies (Judd, James-Hawkins, Yzerbyt, & Kashima, 2005; Fiske, Cuddy, Glick, & Xu, 2002). Based on this idea, researchers have argued that targets of discrimination might be motivated to make attributions to discrimination, since these might protect their sense of competence.

In support of this idea, in two studies, Crocker, Voelkl, Testa, and Major (1991) found that attributing a negative outcome to prejudice can help to protect the self. In the first study, the researchers found that women reported less depressed symptoms when they received a negative evaluation from a prejudiced evaluator than when there was no evidence that the evaluator was prejudiced (see also Testa, Crocker, & Major, 1988). In the second study, knowing that the evaluator could see their race led Black participants to attribute a negative feedback to discrimination to a greater extent, and to report higher personal self-esteem, than when the evaluator could not see their race (Crocker et al., 1991). Additionally, Hoyt et al. (2007) found that Latino participants who were stigmatised were more likely to attribute a negative feedback to prejudice and had higher well-being than those who were not stigmatised. In line with these findings, Twenge and Crocker (2002) found, in a meta-analysis, higher personal self-esteem among African Americans compared with White Americans, presumably because the former could deflect their personal responsibility for negative outcomes by making

attributions to discrimination. In this research, Twenge and Crocker (2002) compared five racial groups to each other in terms of their global personal self-esteem and self-evaluation in several domains. The results indicated that African Americans had higher global personal self-esteem compared with White Americans and other racial groups such as Latinos and Asians. In another study, Major, Quinton, and Schmader (2003) found that when women were exposed to overt prejudice, they indicated higher personal self-esteem than when they were exposed to ambiguous prejudice cues, or to no prejudice at all. The authors argued that women who had suffered a rejection had more positive personal self-esteem because, being able to attribute the negative outcome to discrimination, they did not blame themselves for the negative outcome.

Some researchers also distinguish between the effects of perceived personal and group-based discrimination. Bourguignon, Seron, Yzerbyt, and Herman (2006) tested this and showed that perceived personal discrimination was negatively related to personal self-esteem, whereas, perceived group-based discrimination was related to higher personal self-esteem. These results are in line with the ideas advanced by Major and colleagues. In addition, Bourguignon et al. (2006) reasoned that since group-based discrimination refers to group-based rejection, it implies that one is not alone in the exclusion and this can, by itself, lead to better coping.

These studies support the idea that attributions to discrimination can function as a self-protective attribution—although they do not directly indicate whether or not this affects the extent to which these attributions are threatening or not and whether or not targets are willing to make such attributions.

Other authors have also argued that targets are likely to be inclined to make attributions to discrimination, and even at times to prefer to make these over attributions to lack of ability, but for different reasons. Specifically, according to Sechrist, Swim, and Stangor (2004), people may be motivated to attribute a negative outcome to discrimination, rather than to lack of

ability, to increase or secure a sense of control over their future outcomes. This reasoning assumes that attributing a negative outcome to discrimination grants individuals a greater sense of control over future outcomes than attributing it to lack of ability. The deeper assumption is that attributions to ability are perceived as stable and uncontrollable (one's ability at one moment closely predicts how well one will do at a different point in time) and, therefore, if one admits that lack of ability was the cause of a negative outcome this threatens one's capacity to control future outcomes. By contrast, attributions to discrimination are assumed to be unstable—evaluators (i.e., potential perpetrators) change from one occasion to another and targets are assumed to believe that the extent to which different evaluators are prejudiced varies and that they and successfully avoid discriminatory treatment in the future. These assumptions are, however, as yet untested.

In contrast to the self-protective point of view, other researchers, however, argue that people might be reluctant to make attributions to discrimination because these attributions can have threatening consequences for individuals (Crosby, Pufall, Snyder, O'Connell, & Whalen, 1989). One crucial problem with the idea that attributions to discrimination are self-protective is that there is ample evidence that attributions to discrimination can have negative effects on individuals and are, in fact, very costly. An important point made in the literature is that attributions to discrimination are in part hurtful because they have implications for one's social identity. Schmitt and Branscombe (2002) pointed out that attributions to discrimination encompass both an external (i.e., the perpetrator's prejudiced behaviour) and an internal (i.e., the individual's social identity that is at the basis of the negative treatment) component. The internal component here is that part of the individual's identity that derives from their membership in the group that is targeted by prejudice, e.g., being a woman, being a member of an ethnic minority group. Although it is important to note that this internal aspect does not involve blame and is accompanied by an external element to which blame is directed (Major

et al., 2003), it is nevertheless so that attributions to discrimination make devaluation and exclusion salient and, therefore, are threatening to the individual's fundamental need to belong (Baumeister & Leary, 1995; Carvallo & Pelham, 2006).

A vast body of research demonstrates the relationship between perceived discrimination and poor health outcomes among different stigmatized groups (Deitch, et al., 2003; Gee, Spencer, Chen, Yip, & Takeuchi, 2007; Finch, Kolody, & Vega, 2001; Sellers, Copeland-Linder, Martin, & Lewis, 2006; Pascoe & Smart-Richman, 2009). Indeed, making attributions to discrimination has negative consequences for the psychological health of members of stigmatized groups (Schmitt, Branscombe, Postmes, & Garcia, 2014; Williams, Neighbors, & Jackson, 2003). However, these negative effects are not only limited to lower psychological health, but also extend to reduced physical health (Clark, Anderson, Clark, & Williams, 1999; Sutin, Stephan, Carretta, & Terracciano, 2015). Experiences of discrimination can be harmful to physical health through their impact on cardiovascular responses to discriminatory events (Pascoe & Smart-Richman, 2009). Also experiencing discrimination is shown to be related to higher levels of hypertension, diabetes, cardiovascular disease, and higher blood pressure (Krieger & Sidney, 1996; Major, Elizer, & Rieck, 2012; Richman & Hatzenbuehler, 2014; Williams & Mohammed, 2009).

Another reason why attributions to discrimination are costly is that they are not well received by others. Indeed, research has found that targets who make public attributions to discrimination are seen as complainers and as avoiding responsibility for the negative outcome (Kaiser & Miller, 2001). This is even more so among people who endorse strong beliefs in a just world (Kaiser, Dyrenforth, & Hagiwara, 2006; Major, Kaiser, O'Brien, & McCoy, 2007), among members of the perpetrator's group (Dodd, Giuliano, Boutell, & Moran, 2002), and among members of the discriminated group who are not highly identified with the group (Garcia, Reser, Amo, Redersdorff, & Branscombe, 2005). Targets are aware of these social

costs and often avoid making their attributions public to protect themselves from these costs (Shelton & Stewart, 2004; Swim & Hyers, 1999; Woodzicka & LaFrance, 2001). Therefore, in contrast to what is proposed by the discounting hypothesis, at times to protect themselves people might actually prefer not to make attributions to discrimination, at least in public.

Another important point made in this debate is that the extent to which attributions to discrimination are self-protective or detrimental to wellbeing is likely to be moderated by a range of factors (Barreto, 2014; Barreto & Ellemers, 2015). One of these factors is the degree to which targets identify with the stigmatized group. Research has shown that individuals who highly identify with their group are more likely to attribute ambiguous events to discrimination and this attribution, in turn, is not necessarily self-protective (Major, Quinton, & Schmader, 2003; McCoy & Major, 2003).

Research has also indicated that the effects of attributions to discrimination are related to the extent to which individuals believe that discrimination against their group affects many aspects of their lives (i.e., global), or has severe effects on their life (i.e., severity). If so, then these perceptions are more strongly linked to lower personal self-esteem, than when targets believe that discrimination is less consequential (Eccleston & Major, 2006). Interestingly, self-esteem is not merely an outcome in this process—it can also be a moderator. Indeed, research indicated that when targets are exposed to ambiguous discrimination, individuals with low self-esteem are more likely to experience negative self-directed emotions and impaired task performance than individuals with high self-esteem (Cihangir, Barreto, & Ellemers, 2010). This effect of self-esteem does not emerge when discrimination is blatant, however, since then the individual's self-worth is not in question.

A crucial moderator of the effects of attributions to discrimination is group status. A meta-analysis of correlational studies indicated that perceptions of discrimination have stronger negative relationships with well-being among members of disadvantaged than advantaged

groups (Schmitt et al., 2014). These researchers further proposed that the crucial difference between high and low status groups is how often they encounter discrimination. This raises the possibility that the stability or pervasiveness of discrimination is likely to be a crucial factor moderating effects of attributions to discrimination on well-being. Specifically, attributions to discrimination are likely to be more or less detrimental to wellbeing depending on how stable, or pervasive, discrimination is perceived to be. For example, Schmitt, Branscombe, and Postmes (2003) showed that attributions to discrimination are likely to have more negative effects on wellbeing when they are perceived to be pervasive (i.e., stable) than when they are perceived to be rare (i.e., unstable). Schmitt et al. (2003), therefore, proposed that to understand the effects of attributions to discrimination, it is important to go beyond locus of causality and look also at perceptions of stability.

Pervasiveness of discrimination also affects expectations of future outcomes. When individuals are constantly the target of discrimination (i.e., discrimination is perceived to be pervasive), they are more likely to expect to receive negative outcomes in the future than when discrimination is perceived to be an isolated event. Experiencing stigma and discrimination leads members of stigmatised groups to expect negative treatment from others in future encounters (Meyer, 2003). Indeed, research indicated that being more pessimistic about future outcomes (i.e., expecting negative outcomes in the future) can moderate the extent to which perceived prejudice and discrimination increase depressed symptoms and reduce self-esteem (Kaiser, Major, & McCoy, 2004).

In sum, research in this area shows that attributions to discrimination can at times be self-protective, but evidence also suggests that attributions to discrimination can be hurtful because they can have negative implications for one's identity and expectations about the future, and because they are not well perceived by others. One underlying question in this discussion is whether or not attributions to discrimination are experienced as threatening and how this might

vary across contexts. Although the relevant theory and evidence are suggestive (of different answers to this question), this has in fact not yet been examined directly. Also, although inferences are made regarding whether or not people are motivated to make specific attributions to protect themselves, there has actually been no direct examination of how experiences of threat relate to targets' willingness to make attributions to discrimination. These are the core goals of this thesis. As suggested by Schmitt et al. (2003), when examining this process, it is important to consider how the pervasive discrimination is perceived to be. I elaborate on this in the next section.

2.3 Stability of attributions and its effect on emotions and well-being

2.3.1 Pervasiveness of discrimination

As reviewed above, the effects of attributions to discrimination on wellbeing are likely to be moderated by the extent to which discrimination is perceived as stable/pervasive. Discrimination against members of stigmatised groups is experienced on a daily basis (Carr & Friedman; 2005; Deitch et al., 2003). This, in turn, has negative consequences for self-esteem and life satisfaction, and positively related to depressive symptom (Seaton, Caldwell, Sellers, & Jackson, 2008). The perceived stability/pervasiveness of discrimination can vary across groups (e.g., discrimination against men is likely to be perceived as less pervasive than discrimination against women), but it can also vary between individuals (Carr & Friedman; 2005; Schmitt, Branscombe, Kobrynowicz, & Owen, 2002; Schmitt et al., 2003). That is, people vary in the extent to which they believe that discrimination against their group is pervasive or rare, and these perceptions can be easily influenced or manipulated (Schmitt et al. 2003; Stroebe et al., 2011). Perceiving discrimination as stable/pervasive refers to believing that a group is systematically a target of discrimination, across time and or context (Jetten, Iyer, Branscombe, & Zhang, 2013). As such, perceived stability/pervasiveness is closely linked to expectations about treatment on future occasions and to expectations about treatment in

different contexts. In this situation, attributions to discrimination qualify as relatively stable attributions. As Weiner (1985) explains, when an attribution is stable (e.g., pervasive discrimination), then the outcomes obtained previously will be anticipated to reappear in the future. For this reason, stable/pervasive discrimination can have a significant negative impact on individuals' health and well-being. Research indicated that discrimination that is perceived to be stable/pervasive has negative consequences for individuals, such as depressive symptoms and anxiety (Branscombe, Schmitt, & Harvey, 1999; Foster, 2009). Perceiving discrimination as stable/pervasive is also negatively linked to perceptions of the world as a fair place (Stroebe et al., 2011). That is, stable/pervasive discrimination threatens individuals' beliefs in a just world.

By contrast, when discrimination is perceived to be unstable/rare, it is not expected to reoccur, so this is unlikely to influence future outcomes, or outcomes in other contexts (Jetten et al., 2012) and thus, does not have negative effects on wellbeing (Schmitt et al., 2014). If people believe that discrimination is rare, then attributions to discrimination are relatively unstable, that is, discrimination can or not emerge again, but it is not a stable factor destined to affecting the individual's outcomes.

Pervasiveness of discrimination also has an effect on the extent to which public attributions to discrimination are costly. In a series of studies, Kahn, Barreto, Kaiser, and Rego (2016) found that women who confronted sexism were more supported by other women when they perceived sexism as pervasive than when they perceived it as rare. Interestingly, men were more supportive of the female confronter when they perceived sexism as rare than when they perceived it as pervasive, presumably reflecting their investment in the status quo.

Moreover, the extent to which discrimination is perceived as stable/pervasive influences the coping strategies members of stigmatised group employ. In a 28-day diary study, Foster (2009) showed that people who perceive discrimination against their social group as stable/pervasive

used less active coping and more disengagement strategies at the beginning of the study, whereas, individuals' who perceived discrimination to be rare, reported using more active coping strategies and less behavioural engagement. However, this pattern was reversed at the end of the 28-day period. These researchers reasoned that perceiving discrimination as pervasive is related to depression and anxiety, therefore, people might disengage at the beginning. However, at the end of 28 days, perceiving discrimination as pervasive can lead to motivational qualities, in line with group consciousness theory (see also, Downing & Rousch, 1985).

Despite these findings, research has yet to provide direct evidence for whether or not perceived stability/pervasiveness of discrimination moderates threat experiences. As such, in this PhD I aimed to directly investigate the effect of perceived stability/pervasiveness of attributions to discrimination and examine whether discrimination that is perceived to be stable/pervasive would indeed be experienced as more threatening than discrimination that is perceived to be unstable/rare (Chapters 5 and 6). Given past findings, I expect that attributions to stable/pervasive discrimination are likely to be experienced as more threatening than attributions to unstable/rare discrimination. Instead, attributions to unstable/rare discrimination might actually be perceived as challenging, at least when targets are given the chance to disprove the negative stereotype underlying the treatment they received. In addition, I aimed to examine whether attributional stability would affect the extent to which people make attributions to discrimination and to lack of ability (Chapter 7). In this way, I aimed to provide direct evidence addressing a core debate in the stigma literature, clarifying when specific attributions are experienced as threatening and the implications this has for when they are actually made.

2.3.2 Stability of ability

Previous research also focused on attributions of negative outcomes to lack of ability. As mentioned earlier, the reasoning proposed by Sechrist et al. (2004) assumes that attributions to ability are perceived as more stable than attributions to discrimination. I have already discussed that attributions to discrimination can or not be perceived as unstable/rare. Likewise, attributions to ability are not necessarily perceived as stable. Work by Carol Dweck and colleagues on implicit theories (e.g., Dweck, 2000; Dweck et al., 1995; Dweck & Legget, 1988) shows that people vary in the extent to which they believe that their ability is stable/fixed or unstable/malleable. Dweck and Legget (1988) proposed that there are two types of beliefs about ability, i.e., the belief that ability is fixed (or an ‘entity theory of ability’) and the belief that ability is malleable (or an ‘incremental theory of ability’). Incremental theorists perceive ability to be changeable, flexible, and controllable (unstable) whereas entity theorists believe that ability is a rigid, fixed, and uncontrollable quality (stable).

Implicit theories of ability can be trait-like, but they can also be momentarily influenced, for example by experimental manipulations (Bempechat, London, & Dweck, 1991; Hong, Chiu, Dweck, Lin, & Wan, 1999). Dweck and Legget (1988) proposed that negative outcomes are more threatening for people who hold entity or fixed theories of ability. Specifically, people who embrace an entity theory perceive a negative outcome to be diagnostic of an ability that they cannot change, leading to feelings of helplessness and diminish effort when the task’s demand increases (Robins & Pals, 2002; Ommnudsen, Haugen, & Lund, 2005). In this context, failure is also perceived as a threat to an individual’s sense of competence, which, in turn, is linked with experience of negative affect and decreased self-esteem (Robins & Pals, 2002; Dweck & Leggett, 1988). By contrast, people who hold an incremental theory of ability attribute a negative outcome to their lack of effort and perceive obstacles as challenging since they believe that they can bolster and improve their ability (Doron, Stephan, Boiche, & Le

Scanff, 2009). This also means that the effects of failure on self-esteem are more limited, and indeed failure may motivate individuals to exert and sustain effort and improve performance on subsequent tasks. Malleable beliefs are negatively associated with worry (Cury, Da Fonseca, Zahn, & Elliott, 2008), and reported higher positive affect, and self-esteem (Archer, 1994; Robins & Palse, 2002).

These theories about ability affect individuals' goals, strategies and attributions they select to overcome these setbacks (Blackwell, Trzesniewski, & Dweck, 2007). Implicit self-theories have been shown to be related to goals that individuals adopt, attributions they make, behavioural responses, learning and achievement outcomes (Robins & Pals, 2002). Indeed, an entity theory of ability can negatively influence achievement, whereas, an incremental theory has a positive impact on achievement related outcomes (Aronson, Fried, & Good, 2002; Dweck & Leggett, 1988; Good, Aronson, & Inzlicht, 2004; Ommundsen, 2001). Entity theorists pursue performance goals, meaning that they seek to gain favourable judgement about their competence (Dweck, 1986; Bempechat et al., 1991; Cury, Elliot, Da Fonseca, & Moller, 2006). As such, negative outcomes can portray them as incompetent. These individuals, therefore, see setbacks as a sign that they have reached the limit of their capacity, which is associated with distress, maladaptive and emotion-focused coping strategies and reduced motivation and task disengagement (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Doron et al., 2009; Dweck, 1986; Dweck & Leggett, 1988; Dweck et al., 1995; Robins & Pals, 2002).

By contrast, however, individuals who hold an incremental theory of ability pursue learning or mastery goals (Dweck 1986; Bempechat et al., 1991; Cury et al., 2006). That is, they believe they can increase their competence by learning new knowledge or skills, and focusing on making more effort (Dweck, 1986; Dweck & Leggett, 1988). This sustains their task motivation. As such, incremental theorists see negative outcomes as a way to improve skills and setbacks or as learning opportunities. Incremental theorists therefore take adaptive

and problem-focused coping strategies, such as active coping, planning, and seeking social support (Doron et al., 2009).

In sum, attributions to lack of ability can be more or less stable and this has significant consequences for the extent to which they are likely to be experienced as threatening, or even as challenging. This has, however, not been examined directly either, or in comparison to attributions to discrimination. In this thesis, I do this, using both self-reported and physiological indicators of threat and challenge. Next, I elaborate on this point, before going on to summarize the research I have conducted and which is reported in the next chapters.

2.4 Measuring threat and challenge

When individuals appraise that their personal resources overreach situational demands, they are challenged. In contrast, when they estimate that situational demands overreach their resources, they feel threatened. More specifically to this research, in the context of ability, threat emerges if one thinks that one does not have the ability to cope with a task—or the ability to demonstrate improvement after a negative feedback. In the context of discrimination, threat emerges if one thinks that one does not have the capacity or opportunity to disprove stereotypical judgements, or to avoid them.

Threat and challenge can be experienced as emotions, such as worry, anxiety, eagerness, and confidence (Folkman & Lazarus, 1985). However, work by Blascovich and colleagues has clarified that it is possible to capture physiological correlates of threat and challenge experiences. According to the biopsychosocial model of threat and challenge (BPS) introduced by Blascovich and Tomaka (1996), threat and challenge are motivational states that can be tapped into during motivated performance tasks, such as giving a speech. These motivated performance situations (e.g., a job interview) are situations that are goal relevant and require instrumental cognitive-behavioural responses (Blascovich, Mendes, Hunter, Lickel, & Kowai-Bell, 2001).

Experiences of threat and challenge can be indexed physically through specific cardiovascular (CV) responses. During experiences of challenge, the amount of blood that is pumped by the heart per minute (Cardiac Output) increases and the vascular resistance in the blood vessels decreases (TPR; total peripheral resistance, the overall resistance to blood flow through the systemic blood vessels). However, when individuals are experiencing threat, less blood is pumped by their heart per minute and the vascular resistance is higher. In a nutshell, when people experience threat, their body responds less efficiently than when they experience challenge.

Being able to examine experiences at a physiological level is important both because it provides a more complete view of how targets experience negative outcomes and the attributions they make for these, and because it provides insight into uncontrollable responses that can complement (or be contrasted with) controlled self-reports. Hence, I argue that, in order to fully understand how attributions affect experiences of threat, it is important to investigate this experience of threat both psychologically and physiologically. In the next chapter I will discuss physiological indexes of threat and challenge in more detail.

3 Threat and Challenge

As discussed in the previous chapter, in this research I examine the effects of attributional stability and how this can influence experiences of threat and challenge. To do so, I have combined self-reported data with cardiovascular (CV) responses to have a clearer understanding of participants' emotional states. In this chapter, I further discuss what the CV responses are and how they are measured. In addition, I review studies testing the relationship between stigma and physiological indices of threat and challenge.

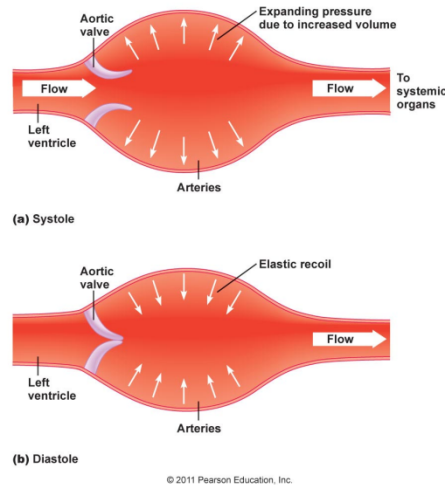
3.1 Biopsychosocial Model of Threat and Challenge

According to the biopsychosocial model (BPS) introduced by Blascovich and Tomaka (1996), threat and challenge are motivational states that are the result of individuals' appraisals of situational demands and personal resources in motivated performance situations. These motivated performance situations are goal relevant, active, and require instrumental cognitive – behavioural responses, such as speech delivery tasks (Blascovich & Mendes, 2000; Blascovich, Mendes, Hunter, Lickel, & Kowai-Bell, 2001). According to the BPS model, when individuals appraise that their personal resources exceed situational demands, challenge emerges. In contrast, when they estimate that situational demands exceed their personal resources, then threat emerges (Tomaka, Blascovich, Kelsey, & Leitten, 1993; Blascovich, 2008). Appraisals of threat and challenge affect physiology, emotions, and motivation. These appraisals also have an impact on performance and achievement. For example, challenge facilitates performance, whereas, threat hinders performance (Mendes & Jamieson, 2011; Moore, Vine, Wilson, & Freeman, 2012).

Threat and challenge can be indexed through self-reported emotions. Specifically, threat experiences are associated with emotions such as worry and anxiety, whereas challenge would be associated with eagerness and confidence (Folkman & Lazarus, 1985). In addition, threat

and challenge can be indexed by physiology, namely, by specific cardiovascular (CV) response patterns. These CV responses are evoked during a goal relevant task and active performance situations (e.g., giving a speech). An ample body of research has established that CV indexes provide two distinguishable patterns for threat and challenge. More specifically, this model discriminates between physiological markers of threat as a maladaptive response to a demanding situation, and physiological markers of challenge which is a more gentle reaction to a demanding situation (Scheepers, Ellemers, & Sintemaartensdijk, 2009; Blascovich, Mendes, Vanman, & Dickerson, 2011; Mendes, Reis, Seery, & Blascovich, 2003).

A state of motivated performance implies a definite level of task engagement. Engagement at the CV level is indicated by a rise in cardiac activation. That is, the heart beats faster (i.e., increased heart rate; HR) and with more force which is indicated by shorter Pre-Ejection Period (PEP). Challenge states are likely to be associated with Sympathetic Adrenal Medullary (SAM) activation and marked by increases in ventricular contractility (Mendes & Jamieson, 2011). More specifically, during motivated performance, in challenge motivational state, the amount of blood that is pumped by their heart per minute (Cardiac Output; CO) increases and the vascular resistance in their blood vessels (Total Peripheral Resistance; TPR) decreases compared to the baseline (Blascovich & Tomaka, 1996; Blascovich & Mendes, 2000). That is, challenge states are associated with more and easier blood flow, which enables the efficient mobilization and transportation of energy to the cells. Although threat is also marked by increases in sympathetic activation, in contrast to challenge, less blood is pumped by the heart per minute (decreased CO) and vascular resistance is higher (increased TPR), leading to a less efficient mobilization and transportation of energy (Mendes & Jamieson, 2011; see Figure 3.1).



Greater blood flows while
individuals experience challenge

Less blood flow when
individuals experience threat

Figure 3.1 Diagram representing blood flow in threat and challenge states

Note. This figure is adopted from Pearson Education, Inc, 2011.

Using cardiovascular responses of threat and challenge to examine these states has several advantages. One of these advantages is that physiological measures can uncover emotional and psychological states that individuals are not willing to reveal. These are uncovered by providing an uncensored view of mental states. Additionally, measurement of threat and challenge through physiological indexes can tap into feelings the person is not even aware of, or has no vocabulary to describe (Blascovich, 2013). These measurements are continuous, covert, and online which enables the researcher to track changes in indexes during tasks (Blascovich, 2000; Mendes, Blascovich, Lickel, & Hunter, 2002). Thus, integrating these data with self-report measures has the potential to provide a clear understanding of participants' emotional status during the task.

3.2 Calculating CV Responses

CV responses are collected through electrocardiograph (ECG), impedance cardiograph (ICG) and blood pressure monitor. ECG measures electrical signals (see Figure 3.2) that are produced by the heart – this records changes in waves of heart rate (HR) which are referred as P, Q, R, S, and T (Blascovich et al., 2011). The P wave or depolarization is the result of the

reception of an electrical impulse and T wave shows repolarization or recovery (Blascovich et al., 2011). QRS complex, therefore, is the result of depolarization of atria and repolarization of the ventricles (Sukanya & Murthy, 2008).

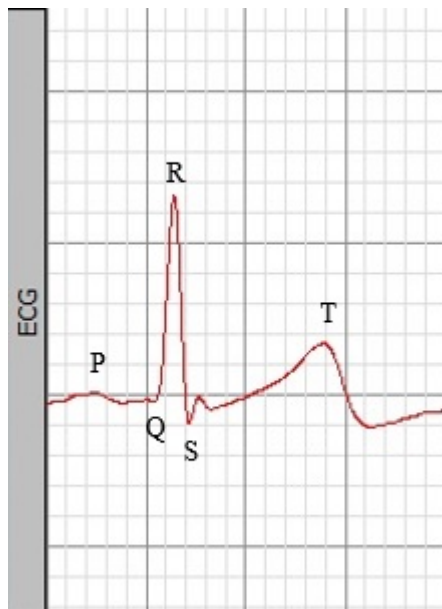


Figure 3.2. P, Q, R, S, and T waves in an ECG signal

ICG is a non-invasive method (see Figure 3.3) to measure cardiac output (CO) and blood flow in the heart (Sherwood, Allen, Fahrenberg, Lovallo, & Doornen, 1990; Blascovich et al., 2011). This technique measures the amount of blood that is ejected or pumped by heart in each cycle, known as Stroke Volume (SV; Blascovich et al., 2011). The ICG waveform is marked by the points A, B, C, X, and O. The B point represents the opening of the aortic valve – that is, the moment that blood is ejected from the heart. The C point is the peak and is associated with ventricular contraction. The X point represents the closure of the aortic valve (the time interval between B and X point is LVET: Left ventricular ejection time; Naidu, Pandey, & Pandey, 2011).

These points are important in order to calculate CV responses of threat and challenge. To calculate these responses, CV responses during a motivated performance task should be

compared to the baseline for possible changes (reactivity). The baseline data is collected before the experiment starts and while participants are seating still (Blascovich et al., 2011). Heart rate (HR) and pre-ejection period, which is the time interval between Q point in ECG and B point in ICG, are needed for calculating task engagement (Blascovich, 2013; Lozano et al., 2007). Cardiac output (CO) and TPR, which differentiate between threat and challenge, are collected through ECG, ICG and blood pressure (BP; these calculations will be discussed in more detail in the result section).

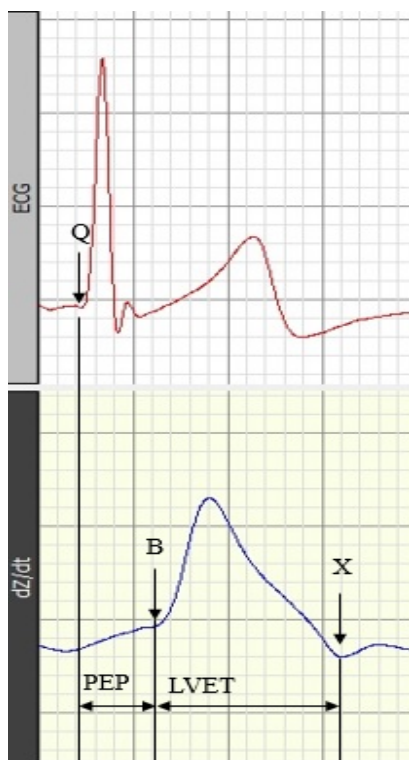


Figure 3.3. ICG (dz/dt) signal and ECG signal – measuring PEP and LVET

3.3 BPS and Stigma

The BPS model of threat and challenge is a well-established model and research has investigated the link between stigma related factors and physiological indexes of threat and challenge. For example, research indicated that stereotype threat can be related to physiological indicators of threat. Exposure to stereotype threat on a cognitive task results in increased blood pressure and consequently decreases performance (Blascovich, Spencer, Quinn, & Steele,

2001). In addition, in domains where members of stigmatised group are negatively stereotyped (e.g., women taking a maths test), stereotype threat is related to CV responses of threat, whereas, when stereotypes are not salient people are more likely to be challenged (Vick, Seery, Blascovich, & Weisbuch, 2008).

Moreover, research has examined threat experiences during intergroup interactions. For example, when non-stigmatised individuals interacted with stigmatised others (e.g., White American participants interacting with Black American confederates), they showed threat responses, whereas, interaction between non-stigmatised individuals elicited more challenge responses (Mendes et al., 2002; Blascovich et al., 2001). These researchers discussed that interacting with members of outgroups increases the perceived demand of the task, relative to interacting with members of the ingroup, whereas the resources remain constant, thereby eliciting experiences of threat (Mendes et al., 2002).

Furthermore, identification can moderate experiencing of threat when individuals perceive discrimination (Eliezer, Major, & Mendes, 2010). In a study by Eliezer et al. (2010), researchers found that when women read that sexism was pervasive, they showed CV reactivity in line with threat during the subsequent task (i.e., giving a speech). The indicators of threat lasted until the recovery time, however, only for those participants with high gender identification. Highly identifiers who were led to believe that gender discrimination was rare did not experience threat during the recovery period.

In addition, status change can influence threat. Scheepers and Ellemers (2005) revealed that when reminded of their status, members of low status groups are more threatened than members of high status groups. However, when there is information regarding a possible change status, members of high status groups are more threatened than members of low status groups. Moreover, stability of status is likely to have an effect on CV responses in line with

threat. In two studies, Scheepers et al (2009) found that stable status difference was threatening for members of low status groups, however, when this difference was unstable, threat turned into challenge for members of low status group, whereas the reverse was observed for members of the high status group (see also Scheepers, 2009).

Finally, some researchers tested the effects of positive feedback in an ambiguous situation on displays of threat and challenge. Research indicated that when Latinas received positive feedback from White peers who were aware of their ethnicity they reacted by showed CV reactivity in line with threat, reported uncertainty and low personal self-esteem (Major, Kunstman, Malta, Sawyer, Townsend, & Mendes, 2016). In a similar vein, Mendes, McCoy, Major and Blascovich (2008) found that positive feedback resulted in increased CV responses in line with threat when Black participants received this positive feedback from White partners that were aware of their ethnicity.

In sum, these findings indicate the importance of CV responses as a non-invasive and unobtrusive method in measuring threat and challenge in response to stigma-related factors. In the research reported in this thesis, three studies (Chapters 5 and 6) examined effects of attributional stability on both self-reported and CV responses of threat. More details of analyses will be discussed in the relevant chapters.

3.4 The Biopsychosocial Model in this research

I have chosen to use the Biopsychosocial Model of threat and challenge in my research because it is a well-established and frequently used model to understand physiological responses to threat and challenge in intergroup contexts (Blascovich et al., 2001; Mendes et al., 2002; Scheepers, 2009). In this section I explain in more detail how I applied this model to my research and its procedural set-up.

The studies reported in this thesis where this model is used (studies 2a, 2b, and 3) involve a job interview paradigm, where participants are under the impression that they are undergoing an online job interview, get rejected for this interview for reasons that vary across conditions and studies, and are subsequently given the chance to explain their qualities in a video recorded speech. This speech is the motivated performance task used in these studies to allow for the measurement of physiological threat and challenge patterns. This procedure has been used in past research as well (Blascovich, Seery, Mugridge, Norris, & Weisbuch, 2004; Mendes, Blascovich, Hunter, Lickel, & Jost, 2007; Scheepers, De Wit, Ellemers, & Sassenberg, 2011). As in past research, participants are given two minutes to prepare this speech. Responses during this preparation period are not always examined, but I consider this to be an important period, as the stressor is already anticipated at this stage. Therefore, in my studies, I have analysed responses during both preparation and speech periods and my hypotheses hold equally for both periods.

Because of the design and cover story of this research, all participants are under *stress*, due to having to perform a job interview. While they perform the job interview, they might be *threatened*, if they believe that they are not very good at this, or *challenged*, if they believe they are good at this. In my studies, I have no way of capturing this difference, which is not the focus of my thesis, so I do not elaborate further on this.

Subsequently, participants hear/read information regarding the stability of attributions (manipulation). At this point, the manipulated information can create a difference in the extent to which participants feel threatened by an *anticipated stressor* (i.e., the possibility of rejection). Participants who read that ability is malleable or that discrimination is rare might feel less threatened because they might be expecting to be accepted (if discrimination is rare) or for a possible negative feedback to be less consequential (if ability is malleable) than participants who read that ability is fixed or that discrimination is pervasive. Importantly,

however, this was not the focus of my study, so again I did not collect evidence that speaks to this and do not elaborate on this further.

My focus in this thesis was on how people respond to *rejection* (the negative outcome that corresponds to the *key stressor*) when they can attribute it to fixed vs. malleable ability or to rare vs. pervasive discrimination. Thus, my focus is on whether *the stress elicited by rejection* results in threat, or challenge, and the extent to which this might be modified by the manipulations. I specifically expected that the rejection would be more threatening when participants feel that they do not have the resources to improve on their ability (if ability is fixed) or to escape/counteract discrimination (if discrimination is pervasive). It is, however, important to note that assessing threat or challenge physiologically requires the performance of a motivated task, at least in line with the biopsychosocial model I followed. As such, I cannot access physiological threat/challenge during the exact moment in which participants receive the rejection—I can only access (and assess) this threat somewhat later, as they judge whether or not they can disprove the negative feedback they received by doing well in the speech delivery task. This means that my predictions refer to physiological patterns that can be obtained either during preparation time, or during the speech delivery task itself—and, crucially, these link to what rejection means to participants, as a function of the manipulation.

4 How People Appraise Attributions to Lack of Ability and to Discrimination

When receiving a negative outcome (e.g., being rejected in a job interview), people are motivated to find the reason for why this outcome happened (Weiner, 1985). This attribution can encompass a variety of causes, including lack of ability or discrimination against a social group to which the individual belongs. Attributions can be defined as perceptions of a cause of an incident (Kelley & Michela, 1980). They are lay explanations that are the result of cognitive appraisals of an event and tend to influence emotional responses to the event and individuals' subsequent behaviours (Compass, Forsythe, & Wagner, 1988; Weiner, 1985). This suggests that attributions can shape how individuals cope with a stressful event (Mclean, Strongman, & Neha, 2007). For example, attributions to unchangeable causes (i.e., stable) is associated with avoidance and wishful thinking coping strategies or attributions to causes that can be controlled is linked to employing self-blame coping strategies (Mclean et al., 2007).

Although specific attributions tend to be linked to specific responses, research suggests that this has less to do with the specific attribution made (e.g., lack of ability) than with the properties this attribution is believed to have (e.g., whether or not it is perceived to be internal, or controllable (Weiner, 1985). Indeed, Weiner (2005) argues that, to understand the impact of causal attributions, we need to go beyond the qualitative differences between different attributions (i.e., which attributions people make, such as lack of ability or discrimination), and focus on systematically analysing their characteristics. In other words, knowing which attributions people make is necessary, but not enough to understand their influence on emotions, motivation, and behaviour. To do so, we need to compare the different possible causes along their psychological dimensions (Weiner, 2005).

Characteristics of Attributions

Attributional theory identifies three core characteristics of causal attributions: Locus of causality, stability, and controllability. In an early attempt to classify the psychological dimensions of attributions, Rotter (1966) proposed that causal attributions can be categorised into external versus internal causes. This refers to the extent to which the specific cause is internal or external to the self (McAuley, Duncan, & Russell, 1992). For example, luck can be perceived as a cause that is external to the self (i.e., something that is not linked to one's qualities or efforts), whereas, effort is seen as an internal cause. Weiner, Frieze, Kukla, Reed, and Rest (1971) suggested that attributions could also be differentiated into stable versus unstable and that this classification was orthogonal to locus of causality. Stability refers to the extent to which a cause is fixed/unvarying versus changeable—irrespective of where this change might come from (i.e., whether it can be caused by the self or by something or someone else). For example, researchers initially described task difficulty as external and stable (if the test is kept constant), since it is determined by the person who sets the test, rather than by the test taker; whereas, effort can be perceived as an internal and unstable cause, since it is determined by the individual performing a task and can vary across time and context (Weiner, 1985). In 1979, Weiner proposed controllability as the third dimension, stressing that attributions can also be classified into causes that are under one's control and causes that are beyond one's control (see also Weiner, 1985). For example, effort, which was classified as internal and unstable, can often be controlled by an individual. That is, one can control how much effort they would make for a task. On the other hand, luck, which was categorised as external and unstable, is not a cause that one can control.

Although these classifications have been useful in developing our understanding of causal attributions, they are limited in that they make strong assumptions about how specific attributions are perceived by the individuals who make them. Indeed, Weiner (2005) later

pointed out that there might be some differences in how people perceive these characteristics, especially with regard to the stability and controllability of a cause. For example, although ability is characterised as an internal, stable, and uncontrollable cause (Weiner, 1985; Russell & McAuley, 1986), people who attribute an outcome to their ability might or not see ability as something stable or even under their control. Major strides in this area have been taken by the work of Carol Dweck and colleagues on implicit theories of ability (for a review, see Dweck, 2002). For example, Dweck and Legget (1988), argue that people differ in their implicit beliefs about the stability of ability, and that this can even vary within individuals, across different domains, that is, an individual might perceive that their ability to do maths is malleable, but their ability to do ball room dancing is rather fixed. In other words, there are strong variations within and between individuals in the extent to which people believe their ability is fixed (stable) or malleable (unstable). Interestingly, these beliefs can be influenced, or manipulated (Aronson, Fried, & Good, 2002; Hong, Chiu, Dweck, Lin, & Wan, 1999).

There is also some debate about how to position attributions to discrimination along the dimensions of locus and stability. For example, some researchers imply that attributions to discrimination are external to the self and unstable (Crocker & Major, 1989; Sechrist, Swim, Stangor, 2004). Other researchers, however, argue that attributions to discrimination are not purely external because they imply the participation of aspects of the self in the locus of attribution, that is, they have both internal and external components. The internal element refers to one's social identity as a member of the targeted group and the external component refers to the prejudiced others (Schmitt & Branscombe, & Harvey, 1999). In addition, attributions to discrimination are not necessarily stable (or pervasive). Indeed, attributions to discrimination can be perceived as stable (pervasive) or unstable (rare), depending on the individual's beliefs, or even on the group membership in question. Like beliefs in the stability of ability, perceptions

of the stability of discrimination can be influenced, or manipulated (Schmitt, et al., 2003; Stroebe, Dovidio, Barreto, Ellemers, & John, 2011).

People also differ in the extent to which they believe that a specific attribution is controllable. For example, some might see ability as strongly determined by nature (e.g., genes) and therefore outside their control, despite its internality. Others might, however, see ability as controllable, something that is in their hands to improve or disregard. And, again, this is likely to vary both between and within individuals, as different domains are considered (e.g., speaking foreign languages vs. carpentry). As already hinted by this description, however, perceived controllability is often argued to be closely related to perceived attributional stability. For example, researchers have pointed out that when discrimination is pervasive (or stable) this is associated with perceived lack of control (or powerlessness) (Verkuyten, 1998; Schmitt & Branscombe, 2002). In a similar vein, although Weiner (1985) conceptualized ability as an uncontrollable causal attribution, Dweck (1986) suggests that this strongly depends on whether ability is perceived as fixed or malleable. If ability is perceived as fixed, then it typically is perceived as outside one's control. If, however, ability is perceived as malleable, people will tend to believe that they can do something to improve it.

Current theorizing in this area, therefore, suggests that it is important not to make assumptions about how people perceive specific attributions in terms of their locus, stability, and controllability. A core goal of this thesis is to examine the consequences of variations in the perceived stability of attributions to discrimination and to lack of ability. I chose to examine this by manipulating these perceptions. Before doing so, however, I found it important to have an idea of how the population from which I drew my samples perceived these attributions. This allowed me to better understand the context in which our studies were conducted and to adjust the manipulations to these default perceptions. In addition, I sought to examine whether these

perceptions of the internality, stability, and controllability of ability and discrimination were associated with other beliefs about the social order, such as system justifying beliefs.

Attributions and System Justification

System justifying beliefs (SJB) are a range of beliefs that justify the status quo, such as the belief that a particular social system is fair and legitimate (Jost & Banaji, 1994). One way to legitimise the unfair distribution of resources (e.g., social and material) between members of high and low status groups is to believe that the world is a just place, where people get what they deserve, and deserve what they get, based on their effort and individual merit (e.g., beliefs in meritocracy or the protestant work ethic, Jost & Banaji, 1994; Jost & Hunyady, 2002; O'Brien & Major, 2005).

Individuals' worldviews can have an effect on the attributions they make (see Jost & Hunyday, 2002; Napier, Mandisodza, Anderson, & Jost, 2007; Stroebe et al., 2011 for a review). Research has shown that worldviews can influence whether people attribute events internally or externally, as well as the degree to which attributions are seen as controllable. Specifically, people high in SJB are more likely to make internal and controllable attributions, than external or uncontrollable, and than individuals low in SJB. For example, the more members of stigmatised groups believe in meritocracy, the less likely they are to attribute a specific negative outcome to discrimination against their group and the more likely they are to believe they deserve that negative outcome (Major, Gramzow, McCoy, Levin, Schmader, & Sidanius, 2002; McCoy & Major, 2007).

Although these studies show that SJBs influence what attributions people make, fewer studies have focused on the extent to which they shape how specific attributions are seen. One exception is a study by Quinn and Crocker (1999) who established that individuals with strong beliefs in the Protest Work Ethic saw weight as more controllable than did individuals who did

not endorse this SJB. Since weight can constitute an attribution for rejection, especially among individuals who are overweight, this suggests that SJBs can influence how specific attributions are perceived. In this first study, my aim was to examine whether SJBs influenced the extent to which attributions to ability and to discrimination are perceived as internal, stable, and controllable.

4.1 Study 1

I do not have a specific hypothesis for this study and it is more exploratory. However, the primary aim of this study was to investigate the extent to which people perceive attributions to lack of ability and to gender discrimination as internal, stable, and controllable. In other words, the goal of this study was to understand people's lay theories about attributions to lack of ability and to discrimination. In this study, I also measured SJB to see whether there is any relationship between these beliefs and the perceptions of attributional characteristics. That is, I wanted to explore if believing in a just world can influence not only what attributions people make, but also the way individuals perceive attributions to discrimination and to lack of ability.

4.1.1 Method

Design and Participants. Female participants were asked to imagine receiving a negative outcome that was due either to lack of ability or to gender discrimination. The independent variable in this study, varied within participants, was, therefore, the type of attribution provided for a negative outcome (to lack of ability or to discrimination) and the dependent variables were the extent to which participants saw each of these attributions as internal/external, stable/unstable, and controllable/uncontrollable.

A total of 60 female participants (age $M= 20.98$ and $SD= 3.33$; 49 were native English speakers with age $M= 20.51$ and $SD= 1.98$) took part in this study. All the participants were students at the University of Exeter. However, the analyses were conducted only on participants

who were native English speakers because during data collection we realised that there was a degree of misunderstanding of the text by non-native English speakers. Only female participants were recruited so as to ensure that gender discrimination was a plausible attribution. The study was conducted using paper and pencil questionnaire.

Procedure. All participants read two scenarios with which I induced attributions for a negative outcome. In the first scenario, participants imagined receiving a negative outcome that was due to lack of ability:

Imagine you applied for a job that you saw advertised online. The job seemed very interesting and had a very attractive compensation package. The selection criteria for this job are described in the advertisement. You think that, although you do not fulfil all of the requirements, it is worth a shot. You have written an application letter, handed in your CV, and added all of the requested documentation. A week after the deadline you receive a letter from the chair of the interview panel. The letter thanks you for your application, describes the high number of candidates and informs you that, unfortunately, you are not invited for an interview. The letter also specifies that the reason why you were not shortlisted for an interview is that you did not have the specific skills required for this job. You discuss this with a girl friend and the two of you come to the conclusion that in fact you did not have the required abilities for this post.

In the second scenario, participants imagined receiving a negative outcome that was due to gender discrimination.

You come across a job opportunity that you find really exciting. You are happy to see that you fulfil all of the requirements listed and decide to apply for the job. Sometime after the deadline you receive a letter from the recruitment panel thanking you for your application and stating that they have received a large number of applications. The letter also states that there were more qualified candidates than you so they will not be interviewing you for this position. You call the company to request more information and speak to a secretary who repeats what is written in the letter. Before you hang up, however, she says "between us, I bet this happened because you are a woman. The committee only had men, and the chair is known for his old-fashioned beliefs about how women should stay at home to look after the kids. Quite a lot of women applied and none was invited for an interview". You are shocked to hear this and conclude that you were discriminated against because you are a woman.

After reading each scenario, participants were asked to take a few minutes to imagine being in the situation described and to answer a few questions about the causes for the negative

outcome. For example after the first scenario participants answered “To what extent do you think that, when you encounter situations similar to this one (i.e., when you do not get something because you do not have the required ability), the cause of failure is something internal or external to you?” on a 7-point scale from 1=“Completely internal” to 7=“Completely external” and for the gender discrimination condition participants rated “To what extent do you think that when/if you are discriminated against because of your gender you can say that the cause of failure is something internal or external to you?” on a 7-point scale from 1=“Completely internal” to 7= “Completely external” (see Appendix A for full wording of the questionnaire).

Measures. To measure characteristics of attributions to discrimination and to ability, after each scenario, participants answered five questions about the cause of the negative outcome in the scenario. Specifically, participants were explicitly told that the cause of failure in the first scenario was lack of ability and were then asked the extent to which they thought that this cause was internal/external, stable/unstable, and controllable/uncontrollable cause for rejection (one item for each). After reading the scenario in which a negative outcome was explicitly attributed to gender discrimination, participants were asked about the extent to this was an internal/external cause for rejection, stable/unstable, and controllable/uncontrollable. Responses were provided on 7-point scales with bipolar anchors.

After answering all the questions about the attributions, participants answered 12 questions measuring their SJB. I used a scale adapted from O’Brien and Major (2005), capturing different aspects of SJB: Protestant work ethic (PWE), perceived system permeability (PSP), and beliefs in system legitimacy (BSL; to review the full questionnaire, see Appendix A).

4.1.2 Results

After excluding non-native English speakers, the analyses were conducted on 49 native English speaking participants. I ran paired samples *t*-tests to compare each attributional characteristic for attributions to ability and to discrimination. The results revealed that participants saw attributions to discrimination as more external, $t(48) = -10.84, p < .001, 95\% \text{ CI} [-2.98, -2.04], d = 1.92$ ($M_{\text{Discrimination}} = 6.18, SD = 1.09, M_{\text{Ability}} = 3.67, SD = 1.30$) and less controllable than attributions to lack of ability, $t(48) = -10.63, p < .001, 95\% \text{ CI} [-3.18, -2.17], d = 2.47, (M_{\text{Discrimination}} = 5.57, SD = 1.19, M_{\text{Ability}} = 2.90, SD = .96)$. However, participants perceived attributions to ability as equally stable as attributions to discrimination, $t(48) = -.19, p = .85, 95\% \text{ CI} [-.47, .39], d = .03, (M_{\text{Discrimination}} = 4.71, SD = 1.21, M_{\text{Ability}} = 4.67, SD = 1.23$; see Figure 4.1).

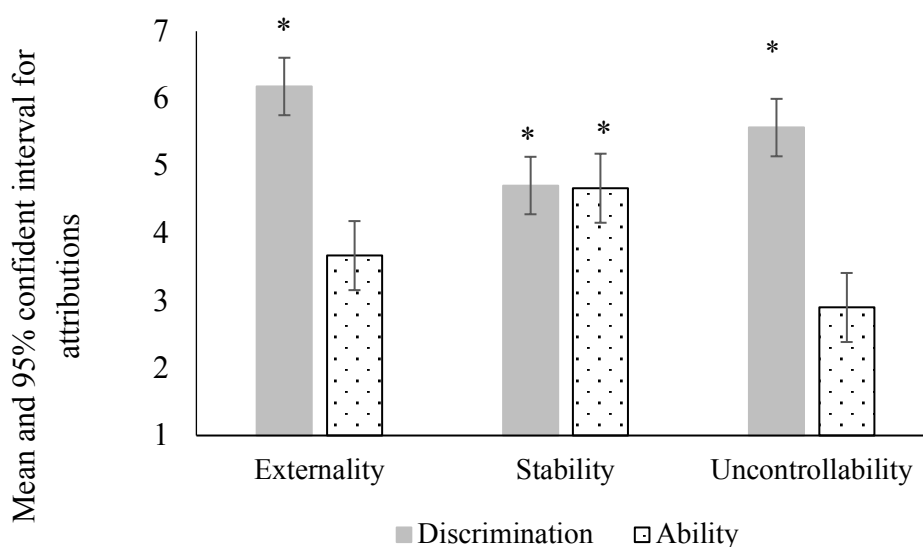


Figure 4.1 Paired comparisons between attributional characteristic and each attribution.

Note. Bars with an * have means over the mid-point of the scale, with $t_s > 3.83$ and $p_s < .001$.

In addition, test of difference to mid-point suggest that whereas attributions to discrimination were perceived as external and uncontrollable, attributions to lack of ability were perceived as largely controllable, $t(48) = -8.013, p < .001, 95\% \text{ CI} [-1.38, -.83], d = -1.18$.

The whole SJB scale had a satisfactory reliability ($\alpha = .66$); however, among its subscales only PWE was reasonably reliable ($\alpha = .69$; PSP, $\alpha = .43$; BSL, $\alpha = .44$). There were no reliable correlations between any SJB scale (the complete scale or any subscale) and any of the above measures (all 6 items). However, as it is shown in Table 4.1, BSL negatively with externality of ability, $p = .042$. More specifically, the more beliefs in system legitimacy is, the more internal ability is perceived. The correlation between BSL with externality of discrimination was not significant, $p = .114$. Moreover, controllability of discrimination and lack of ability were negatively and significantly correlated ($p = .021$). That is, the higher one can control their ability, the lower control they have on discrimination. Finally, there was a positive and significant correlation between locus of causality of discrimination with stability of ability ($p = .017$). This indicated that, the more external discrimination is perceived, the less stable ability is seen.

Table 4.1

Correlations between dependent variables

	1	2	3	4	5	6	7	8	9	10
1.SJB	-									
2.PWE	.73**	-								
3.PSP	.67**	.22	-							
4.BSL	.63**	.19	.15	-						
5.Ability's locus of causality	-.17	-.08	.004	-.29*	-					
6.Stability of ability	.09	.17	-.14	.16	.08	-				
7.Controllability of ability	.13	.24†	.05	-.06	.02	.24	-			
8.Discrimination's locus of causality	.17	.06	.10	.23†	.09	.34*	-.002	-		
9.Stability of discrimination	.17	.09	.14	.14	-.01	.24	.15	-.07	-	
10.Controllability of discrimination	.04	.02	.002	.03	-.03	-.01	-.33*	.14	-.10	-

†< .119. * $p < .05$. ** $p < .001$

4.2 Discussion

Attributions are the answer to the *why* question (especially for unexpected negative outcomes) and characteristics of causal attributions (i.e., locus, stability, and controllability) can guide the effects of these attributions on emotions, motivation, and behaviour (Weiner, 1985; 2005). This study aimed to examine how attributions to ability and to gender discrimination are perceived among a sample drawn from the same population as the samples of the main studies. The results indicated that, when no other information is provided, participants in our pool tend to perceive that discrimination is more external and less controllable than ability. This is in line with prior research suggesting that discrimination is a more external attribution than lack of ability (Major, Kaiser, & McCoy, 2003; Schmitt & Branscombe, 2002) and that attributions to discrimination are associated with powerlessness (Schmitt & Branscombe, 2002; Verkuyten, 1998).

These findings also suggest that participants in our pool believe that attributions to discrimination and to lack of ability are equally stable. This suggests that attributions to ability and to discrimination are not necessarily perceived to differ in terms of stability, when no other information is provided, or when situations, where these attributions are made, do not differ in any other important ways. While this is unclear, it provides the perfect opportunity to influence these perceptions, since none of these attributions more or less stable than the other.

It is, however, possible that stability gains different meanings, and has different implications, when it refers to attributions to lack of ability and when it refers to attributions to discrimination. As previously stated, prior research has shown that individuals vary in the extent to which they perceived these attributions as stable (i.e., there is variation in implicit theories of ability and in perceived pervasiveness of discrimination; Dweck & Legget, 1985; Schmitt, Branscombe, Postmes, 2003), and that these variations can be elicited by contextual features (e.g., manipulated information). Building on this, in the next two experiments we

aimed to influence the extent to which participants perceived these attributions as stable and to examine the effects of this perceived stability on emotion and motivation.



5 The Role of Attributional Stability in Perceived Threat vs. Challenge When Receiving a Negative Outcome

Despite reduction in blatant discrimination, membership in a stigmatised group still implies that stigmatized individuals can be targets of discriminatory treatment. For example, women still experience a gender gap in many domains, such as employment rates and salary (Barreto, Ellemers, Cihangir, & Stroebe, 2008), and ethnic minorities still encounter discriminatory treatment in education, housing, and employment compared to White Americans (Sidanius & Pratto, 2001).

Discrimination can be defined as the unequal and illegitimate distribution of resources, like jobs, among different social groups (Scheepers, Spears, Manstead, & Doosje, 2009). Although individuals who belong to socially stigmatized groups are not necessarily discriminated against, discrimination is more prevalent among members of stigmatised groups compared to members of non-stigmatised groups (Schmitt & Branscombe, 2002). For members of stigmatized groups, discrimination is always a possible explanation for negative outcomes (e.g., rejection in a job interview). The fact that much of the discrimination encountered in modern societies is quite subtle (Barreto et al., 2008) has been taken to mean that members of stigmatized groups can choose whether or not to make these attributions, depending on whether or not such attributions would be self-protective (see Barreto & Ellemers, 2015 for a detailed discussion).

However, exactly when and why such attributions might be self-protective has been the subject of heated debate within the social stigma literature. On the one hand, work by Crocker and Major (e.g., Crocker & Major, 1989) suggests that attributions to discrimination are self-protective if they discount the role of “internal, stable, and global” causes, such as attributions to lack of ability (p. 163). In other words, attributing a negative outcome to discrimination can

deflect self-blame and direct the cause of the negative outcome towards prejudiced others. By contrast, attributions to lack of ability are associated with self-blame and can undermine one's sense of competence, being, thus, more harmful to the self. If so, then attributions to discrimination can function as a coping strategy when facing a negative outcome, which helps to reduce threat to personal self-esteem (Major & Eliezer, 2011).

Sechrist, Swim, and Stangor (2004) additionally pointed out that compared to attributions to lack of ability, attributions to discrimination can increase or secure a sense of control over future outcomes. Hence, the researchers assumed that attributions to ability are likely to be perceived as stable, so when the outcome is negative this would imply long-term inability to achieve positive outcomes, which is likely to be quite threatening. In contrast, attributions to discrimination are assumed to be perceived as unstable, since evaluators (i.e., potential perpetrators) change from one occasion to another, which implies that negative outcomes attributed to this cause are not inevitable.

Other authors have, however, argued that attributing a negative outcome to discrimination can be highly threatening to the self. Being a victim of discrimination implies that a part of one's social identity (i.e., that part of one's identity that derives from membership in the discriminated group) is devalued (Schmitt & Branscombe, 2002; Schmitt, Branscombe, & Harvey, 1999), which can be a threat to one's feeling of acceptance in society (Carvallo & Pelham, 2006). Indeed, perceiving discrimination is associated with negative psychological and physiological responses, such as anxiety, helplessness, anger, high blood pressure and increased heart rate (Clark, Anderson, Clark, & William, 1999).

Perceived Attributional Stability and the Impact of Attributions to Discrimination

Schmitt Branscombe & Postmes (2003) additionally proposed that the extent to which attributions to discrimination are threatening—and more so than attributions to lack of ability—

depends on how pervasive, or stable, they are perceived to be (see also Schmitt & Branscombe, 2002; Schmitt, Branscombe, Postmes, & Garcia, 2014; Stroebe, Dovidio, Barreto, & Ellemers, 2011). In contrast to what was suggested previously (Crocker & Major, 1989; Sechrist et al., 2004), these authors argued that attributions to discrimination are not necessarily unstable. Indeed, attributions to discrimination are only unstable if discrimination against the target's group is rare (e.g., men facing sexism), but they are relatively stable for members of groups who encounter more pervasive discrimination (e.g., women facing sexism) (Schmitt, Branscombe, Kobrynowicz, & Owen, 2002; see also Jetten, Schmitt, & Branscombe, 2012). In addition, members of the same social group can vary in the extent to which they perceive attributions to discrimination as pervasive/stable or rare/unstable, depending for example on how well-informed they are about it (Schmitt et al., 2003; Stroebe et al., 2011), or whether or not they have encountered it themselves in the past (Stroebe, Ellemers, Barreto, & Mummendey, 2008). Note also that when I asked participants to rate the stability of specific attributions (see Study 1 of this dissertation), I did not find overall differences in the perceived stability of attributions to discrimination and to lack of ability.

With regard to sense of control, it is also not self-evident that making attributions to discrimination would increase one's sense of control over future outcomes, contrary to what had been suggested by Sechrist et al. (2004). Indeed, if individuals perceive discrimination as pervasive/stable, they will expect to be the target of discrimination in the future and will still feel little control over whether or not this will happen (Verkuyten, 1998; Jetten, Schmitt, & Branscombe, 2012; Schmitt et al., 2014). The results of Study 1 in this thesis also suggest that discrimination can be seen as less controllable compared with attributions to lack of ability.

All in all, then, it is clear that the extent to which attributions to discrimination are perceived as stable (i.e., being influenced by the perceived pervasiveness of discrimination) is likely to determine how it is experienced. What is currently missing, however, is direct

evidence about whether or not attributions to discrimination are indeed experienced as more threatening when they are perceived as stable than when they are perceived as unstable.

Perceived Attributional Stability and the Impact of Attributions to Lack of Ability

Moreover, just as with attributions to discrimination, attributions to ability are not necessarily stable. Indeed, attributing a negative outcome to lack of ability is only stable if one believes that a particular ability is fixed and cannot be improved, whereas, it will be an unstable attribution if one believes that ability can change. Work by Dweck and colleagues has demonstrated that people have implicit theories about whether their abilities are fixed or malleable and these theories differ both across individuals and, within individuals, across domains (Dweck & Leggett, 1989).

Although Dweck and colleagues did not directly measure threat experiences, they did provide evidence suggesting that individuals are more threatened by setbacks when they have a fixed than a malleable theory of ability. For example, individuals with a fixed (or entity) theory of ability show more helpless responses and diminished task effort as task demands increase (Ommudsen, Haugen, & Lund, 2005). Also, individuals with fixed theories of ability report more negative affect, low self-esteem, and poorer performance when they receive negative outcomes than individuals with malleable (or incremental) theories of ability (Archer, 1994; Cury, Da Fonseca, Zahn, & Elliott, 2008; Robins & Pals, 2002; Dweck & Leggett, 1988). These patterns emerge because individuals who have fixed theories of ability perceive that a particular performance is diagnostic of their ability, whereas those with malleable theories see each particular performance as part of a trajectory (Dweck, 1986).

In sum, the perceived stability of attributions to ability (influenced by beliefs about the malleability of ability) is likely to shape the extent to which these attributions are experienced as threatening. However, to our knowledge the direct effect of attributional stability on experiences of threat has not been examined yet.

Overview of the Research

In line with the gaps identified above, in two separate studies I examined the extent to which attributions to discrimination (2a) and to lack of ability (2b) are experienced as threatening or challenging as a function of their perceived stability. Here, in keeping with the original conceptualisations of Schmitt and Branscombe (2002), for attributions to discrimination, and of Dweck and Leggett (1988), for attributions to ability, pervasiveness of discrimination and stability of ability both refer to changeability of attributions to discrimination and to lack of ability across time. My specific hypotheses are listed below:

- a. I expected that stable (pervasive discrimination in Study 2a and fixed ability in Study 2b) attributions would be experienced as more threatening than unstable attributions (rare discrimination in Study 2a and malleable ability in Study 2b), which might even be experienced as challenging. Specifically, this means that:
 - b. Hypothesis 1: I expected more threat-related emotions in the stable than unstable conditions.
 - c. Hypothesis 2: At the physiological level, I expected to observe physiological responses consistent with a threat response in the stable conditions, i.e., a decrease in CO relative to baseline, and an increase in TPR relative to baseline (hypothesis 2a). I also expected greater decrease in CO and increase in TPR (i.e., more threat responses) in the stable than in the unstable conditions (hypothesis 2b). These effects are expected during preparation time and/or the speech task.
- d. Though my main hypothesis is that stability of attributions increases threat, rather than instability increases challenge, I also examined whether the latter was the case. For this, I derived more exploratory hypothesis 3, expecting more challenge-related emotions in the unstable than stable conditions; and hypothesis 4, expecting to observe a physiological pattern consistent with challenge responses, i.e., an increase in CO relative to baseline and a decrease

in TPR, relative to baseline in the unstable conditions (hypothesis 4a) and more so than in the stable conditions (hypothesis 4b), during preparation time and/or the speech task.

To provide a multi-faceted examination of these issues, I examined threat and challenge with two indicators: Self-reported measures and physiological responses. Self-reported threat and challenge were assessed through emotions theoretically associated with these motivational states (Folkman & Lazarus, 1985). Specifically, threat experiences are associated with anxiety and worry, whereas challenge tends to be associated with eagerness and confidence.

Physiological responses were examined following the biopsychosocial model developed by Blascovich and Tomaka (1996). This model describes cardiovascular indices of threat and challenge motivational states during motivated performance situations (e.g., a job interview, giving a speech). During motivated performance, challenge and threat result from appraisals of the situational demands and the individuals' resources to deal with these demands (Blascovich & Tomaka, 1996). When individuals appraise that demands exceed resources they feel threatened, whereas when they evaluate that resources approach or exceed demands, they experience challenge. These appraisals can be conscious, but they can also happen outside of conscious awareness (Blascovich, Mendes, Hunter, & Lickel, 2000). Therefore, a non-invasive method, such as physiological indexes, can provide information about individual's emotional states that complements information obtained with self-reports.

A large body of research has established that cardiovascular (CV) indexes provide two distinguishable patterns for threat and challenge (Blascovich, Mendes, Vanman, & Dickerson, 2011; Mendes, Reis, Seery, & Blascovich, 2003). Motivated performance, which lies at the basis of both challenge and threat, implies a certain level of task engagement. At the cardiovascular level engagement is marked by increased cardiac activation: The heart starts to beat faster, as indicated by increased heart rate (HR) and with more force, as indicated by a shorter Pre-Ejection Period (PEP). When individuals experience challenge during motivated

performance, more blood that is pumped by their heart per minute (Cardiac Output; CO) increases and the resistance of their blood vessels decreases (Total Peripheral Resistance; TPR; Blascovich & Tomaka, 1996; Blascovich & Mendes, 2000). That is, challenge states are associated with more blood and easier blood flow, which enables the efficient mobilization and transportation of energy to the cells. In contrast, when individuals are experiencing threat, less blood is pumped by their heart per minute (low CO) and the vascular resistance is higher (high TPR), leading to a less efficient mobilization and transportation of energy.

5.1 Experiment 2a

This experiment focused on attributions of a negative outcome to discrimination. The goal of this study was to test the extent to which attributions to discrimination are threatening as a function of pervasiveness/stability of those attributions.

5.1.1 Method

Design and participants. In this experiment, participants were exposed to a negative outcome (rejection in a job interview) that was attributed by the experimenter to rare vs. pervasive gender discrimination. The experiment, thus, included one between-participants factor with two levels. Participants were randomly allocated to either the pervasive/stable or to the rare/unstable condition. A total of 73 female participants took part in this experiment. No power analyses were conducted prior to the experiment to calculate sample size. However, the sample size is similar to the ones used in previous studies using a similar paradigm (see Derks, Scheepers, Van Laar, and Ellemers, 2011). Data from a total of 16 participants were excluded from the analyses due to technical difficulties: Two because of problems with the video camera used in the job interview (the camera was not on) and one due to not having variability in responses and 13 because the physiological data was either lost, or impossible to analyse due to the presence of noise and movement artefact. Of these 16 excluded participants, 11 were in

the stable condition (29.73% of participants in this condition), and 5 were in the unstable condition (13.89% of participants in this condition). Analyses were conducted on the 57 remaining participants (31 participants in stable/pervasive condition, and 26 participants in unstable/rare condition).

Procedure. Participants were invited to the lab to participate in a study looking into the psychological and physiological experience of online job interviews. Upon arrival in the lab, participants were received by a female experimenter (myself), signed the informed consent after which the experimenter provided more details about the study (for the informed consent see Appendix B). The experimenter stated that the study involved an online job interview that was not meant to select candidates for a real job, but that was meant to mirror interviews for real jobs, to allow us to study experiences during such situations. The interview would not be focused on a specific type of position, but instead on aspects that tend to be relevant across a variety of jobs. The job interview was in fact bogus, but all effort was made to lead participants to believe that it was real. The experimenter then escorted participants to the experiment room, provided basic instructions, and applied sensors for the recording of physiological indicators.

Participants were asked to use the computer to read instructions and respond to the interview questions, but to try to otherwise move the least possible, so as not to interfere with physiological measurements. At this point, the experimenter left the room allegedly to check which interviewer was available to interview the participant. After one minute, the experimenter returned to the room and informed the participant that the available interviewer was Mr. Peter Wilson. This procedure was followed to ensure that the participant knew the experimenter knew who the interviewer was—knowledge that was necessary to render the manipulation credible.

Participants read that they were going to take part in an online job interview with one of 20 human resource (HR) managers from companies around Exeter, all of whom volunteered to help with the study. Participants were told that these 20 HR managers were experienced with recruitment and hiring processes and represented the various domains in which graduates apply for jobs (e.g., business, retail, real estate, service jobs). These specific HR managers were selected because they formed a representative sample of the type of person who carries out job interviews in these various contexts. This information was provided to ensure that participants linked the procedures followed in this experimental context to how they might be treated in real life when applying for jobs.

Participants read that they would first receive some basic information about the interviewer and then would receive 5 interview questions, one by one, through the computer. Participants were to answer each question orally by looking at the video camera that was provided. They were told that the interviewer would be able to see them and evaluate their performance.

Once participants had received these initial instructions, but before the interview took place, a 5-minute rest period took place to collect baseline physiological data (Scheepers, Saguy, Dovidio, & Gaertner, 2014). During this baseline period, participants watched a video showing images of deep sea animals and plants (used in prior research by Piferi, Kline, Younger, & Lawler, 2000) to ensure they were focused and relaxed. After 5 minutes, the computer showed some basic information about the interviewer, including his name and a photograph. This photograph was piloted to ensure it credibly represented a professional HR manager. A total of 20 female participants took part in this pilot study. They saw 5 photos one by one (counterbalanced; 10 participants saw photos 1 to 5, others saw them 5 to 1). After each photo participants rated it on five scales from 1= not at all to 7= very much. The results revealed that the photo that was eventually used was rated as friendly as others ($M = 4.25$, $SD = 1.48$),

reasonably competent ($M= 5.3$, $SD= .923$), reasonably professional ($M = 5.40$, $SD= 1.04$), credible as HR manager ($M= 5.15$, $SD= 1.31$), credible for being sexist ($M= 4.20$, $SD= 1.64$), and slightly less attractive ($M= 2.45$, $SD= 1.43$; for questions see Appendix B).

When participants were ready to start the interview, they pressed the ‘space bar’ and the computer screen showed that it was connecting to the interviewer. An introductory message from the interviewer appeared on the screen (i.e., “*Hi, I am Peter Wilson, shall we start?*”), after which the first interview question was shown. Participants answered each question orally, while looking at the camera, and pressed the space bar when they were ready to see the next question. The questions asked were credible interview questions, but they were deliberately vague, so as to be relevant for all participants, irrespective of their study major, or career plans. Specifically, the questions were:

- What type of jobs are you interested in?
- What do you look for in a job?
- What has been your best work experience?
- What skills do you have that will make you a good employee?
- Can you give an example of good team work you have been a part of?

Manipulation. After the last question, the interviewer indicated the interview had ended, thanked the participant, and disconnected. At this point, the experimenter returned to the room and informed the participant that it would take a few minutes for the interviewer to complete and email the evaluation sheet. The experimenter then asked the participant how the interview went and then communicated the manipulation of stability of discrimination. The manipulation was based on the manipulation used by Schmitt et al. (2003) to manipulate pervasiveness of discrimination. In the unstable condition, the experimenter stated: “Let’s see what the interviewer says. Your interviewer was Peter, right? Hmm, you know, I have worked

with all of the 20 interviewers and this guy seems to give almost all of the women negative evaluations, but he is very positive towards the men. This guy does not seem to like any women, so he seems really sexist. But all of the other interviewers are very reasonable and fair. Well, this is how things are—you will not encounter sexism very often out there.”

By contrast, in the stable condition, the experimenter stated: “Let’s see what the interviewer says. Your interviewer was Peter, right? Well, you know, I have worked with all of the 20 interviewers, including this guy. They give almost all of the women negative evaluations, but they are very positive towards the men. None of them seem to like any women. They all seem to be sexist. Well, this is how things are—you will encounter sexism very often out there.”

The experimenter practiced delivering this text until she was able to deliver it in a natural and standardised way. The specific wording of the message was adjusted until this was achieved. The wording indicated above consists of the final wording.

At this point, the experimenter left the room to retrieve the evaluation sheet emailed by the interviewer. This evaluation sheet had been electronically filled in. The first line of the evaluation contained ‘Recommendation: accept or reject?’ and the interviewer had ticked the ‘reject’ option. Below, the interviewer had evaluated the participants on a number of separate dimensions on a scale from 1 to 5 (poor-excellent): Job skills (2), Writing skills (2), Motivation (2), Creative potential (1), Intelligence (3), Social skills (2), Overall evaluation (2). After one minute and a half, the experimenter returned to the room, gave the evaluation sheet to the participant, and asked to answer some questions through the computer (for evaluation sheet see Appendix B). At this point participants answered some checks which are elaborated in more details below.

Motivated performance task. As mentioned, to assess physiological indicators of threat and challenge it is necessary to introduce a motivational task, in which it would be evaluated (e.g., by others; see Blascovich & Mendes, 2000). In this situation appraisal of the situation for threat or challenge would be expected to take place. In this study, participants were asked to video record a short speech (3 minutes; see Mendoza-Denton & Page-Gould, 2013) in which they described their work abilities. They were given some tips about what to cover (e.g., similar to the questions the interviewer asked) and 2 minutes preparation time.

After they delivered their speech, participants completed the emotion questionnaire (see below) and underwent a 5-minute recovery period, during which they simply sat back and relaxed (see Mendoza-Denton & Page-Gould, 2013). After 5 minutes, participants answered the remaining questions (for the complete questionnaires see Appendix B). At this point participants were told that the experiment was finished, so they were debriefed¹, thanked, and compensated for their participation (first year psychology students chose between receiving 1 course credit or £5, whereas the remaining participants received £5).

Measures. After participants received the evaluation form indicating they had been rejected and heard the comments attributing the rejection to stable vs. unstable discrimination, they answered questions about what their outcome had been (outcome check), and what they thought was the cause of their outcome (attribution check). Emotions were then measured twice: Once right after the speech delivery task, and a second time after the recovery period. At this stage, participants also answered questions about the speech delivery task. Unless otherwise specified, all questions were answered by expressing agreement with statements on

¹ Funnel debriefing was not conducted in this research. Participants were given a written copy of the debriefing form and, after participants read it, I answered their questions about the study. For ethical reasons, I was concerned with ensuring that participants would read the debriefing form fully and this was not easily compatible with a funnel debriefing approach.

7-point Likert-type scales (from 1 = not at all to 7 = very much). Physiological indicators were assessed continuously throughout the experiment.

Checks. Participants indicated whether they had received a negative or a positive evaluation from the interviewer, and whether the interviewer had recommended acceptance or rejection, if the interview had been for a real job.

Attributions. The set-up of this experiment aimed to encourage participants to attribute their rejection to gender discrimination. To check the extent to which this was done, I measured attributions to discrimination and to lack of ability, and expected to find that participants made more attributions to discrimination than to lack of ability in both conditions. Two items were used to assess attributions to *lack of ability*: “The recommendation I received from the interviewer was mainly due to my performance during the interview (what I said and how I behaved) and “The recommendation I received from the interviewer was mainly due to my interview skills.” These items formed a reliable scale ($r = .79$) and were averaged for analyses. *Attributions to gender bias* were measured with two items: “The recommendation I received from the interviewer was mainly due to prejudice on the part of the interviewer” and “The recommendation I received from the interviewer was mainly due to a biased opinion on the part of the interviewer.” These two items also formed a reliable scale ($r = .73$).

Emotions. Participants rated the extent to which they experienced 12 emotions related to threat and challenge (inspired by the work of Folkman & Lazarus, 1985) twice during the experiment: First before the 5-minute recovery period and again after the recovery period. For threat-related emotions we measured the extent to which participants felt anxious, worried, calm, relaxed, and threatened. After recoding positive emotions, these items formed a reliable scale and were averaged for further analysis ($\alpha_{\text{before}} = .89$, $\alpha_{\text{after}} = .83$). For challenge-related emotions I measured the extent to which participants felt eager, confident, discouraged,

challenged, low, disappointed, and sad. After recoding negative emotions, the item “challenged” was negatively (instead of positively) related to the overall scale. I concluded that this item was ambiguously interpreted (since it can be seen as a positive emotion, but it can also be understood as a euphemism for “difficult”) and therefore excluded it from analyses. The resulting items formed a reliable scale ($\alpha_{\text{before}} = .81$, $\alpha_{\text{after}} = .77$) and were averaged for subsequent analyses.

Speech delivery appraisals. In line with the biopsychosocial model and associated procedures, after the recovery period and the second measurement of emotions, participants answered three questions regarding their experience during the speech delivery task. These questions measured perceived stress, subjective effort exerted, and subjective performance (adapted from Mendes et al., 2002). These help to establish that the motivated performance task is perceived as stressful and that participants are equally invested across conditions. Though it is possible that these are affected by condition (again with higher scores expected for stress and effort, and lower for subjective performance in the stable condition, reflecting greater threat), their primary aim is to demonstrate a reasonable level of perceived stress and subjective effort in both conditions.

Manipulation checks. Following Schmitt et al. (2003), we checked the manipulation of stability of discrimination with three items from the Public Collective Self-Esteem subscale (Luhtanen & Crocker, 1992; See appendix B). Items asked to what extent participants thought that women are a devaluated group in society.

Cardiovascular responses. I collected cardiovascular responses continuously during the experiment by measuring Impedance Cardiography (ICG), Electrocardiography (ECG), and continuous blood pressure (BP) with the Biopac MP150 system (Biopac Systems Inc., Goleta, CA). These responses were stored and scored using *AcqKnowledge* software (Biopac

Systems). These CV responses allowed to calculate HR, CO, PEP, and TPR which were necessary for further analyses.

5.1.2 Results of Self-Report Measures^{2,3}

Manipulation checks. Although the means were in the intended direction ($M_{\text{Pervasive}} = 4.39$, $SD = 1.16$; $M_{\text{Rare}} = 4.06$, $SD = 1.04$), an ANOVA on the public collective self-esteem scale did not reveal a significant effect of condition, $F(1, 55) = 1.20$, $p = .278$, $\eta_p^2 = .021$.

Attributions. I conducted a 2 (Attribution: ability vs. bias) x 2 (Condition: Pervasive vs. Rare) repeated measures MANOVA, with repeated measures on the first factor, to compare attributions to gender bias and to ability across conditions. This analysis revealed no reliable effect of pervasiveness (stability), $F(1, 55) = 0.49$, $p = .484$, $\eta_p^2 = .009$, no significant effect of type of attribution, $F(1, 55) = 3.02$, $p = .088$, $\eta_p^2 = .052$, but a significant interaction between type of attribution and pervasiveness, $F(1, 55) = 5.03$, $p = .029$, $\eta_p^2 = .084$. As can be observed in Table 5.1, contrary to what was intended, attributions to gender bias were unaffected by the manipulation, $t(54) = 1.38$, $p = .174$, 95% CI [-.23, 1.25], $d = .37$. However, attributions to lack of ability were significantly affected by the manipulation of pervasiveness of discrimination: Participants made more attributions to lack of ability when they perceived bias to be pervasive than when it was rare, $t(54) = 2.07$, $p = .044$, 95% CI [.02, 1.69], $d = .55$. Also, when discrimination was pervasive, participants made more attributions to ability than to bias, $t(54) = 2.95$, $p = .005$, 95% CI [.39, 2.03], $d = .86$, whereas they made attributions to ability and to

² Unless specified, the simple effects are reported as t -tests. These refer to the pairwise comparisons from the ANOVA and are not individual tests. The p 's reported thus account for the multiple comparisons issue (e.g., they are identical to the simple main effects produced in the multivariate output). The decision to report simple effects this way was made to simplify the output and indicate directionality. To produce these, Mean differences were divided by Standard errors.

³ When analysing data from all of the available data in self-reports, in line with the results reported here, the results indicated no significant effect of pervasiveness on manipulation checks $p = .524$. Other significant findings, however, disappeared in these analyses, $ps > .067$. For the full analyses please see Appendix E.

bias to a similar extent when bias was perceived to be rare. No other effect was significant in this analysis (see Table 5.1).

Table 5.1

Means and SDs of attributions to lack of ability and to bias in both conditions

Stability/Locus	Ability	Bias
Rare	4.29 (1.68) ^b	4.44 (1.38) ^b
Pervasive	5.15 (1.46) ^a	3.93 (1.39) ^b

Emotions. Emotions were analysed in two different ways: By comparing reported threat with reported challenge within each time point and by comparing the extent to which each emotion was reported across time points (before vs. after the recovery period).

Threat versus challenge before the recovery period. To test hypotheses 1 and 3, I ran a 2 (Type of emotion: threat vs. challenge) x 2 (Condition: Pervasive vs. Rare discrimination) repeated measures MANOVA, with type of emotion as a within participant factor. This analysis revealed a significant interaction between type of emotion and pervasiveness of discrimination, $F(1, 55) = 4.49, p = .039, \eta_p^2 = .075$. Consistent with hypothesis 1, this interaction indicated that participants in the pervasive condition ($M = 4.27, SD = 1.24$) reported significantly more threat than participants in the rare condition ($M = 3.49, SD = 1.39$), $t(56) = 2.26, p = .028, 95\% \text{ CI} [-1.48, -.09], d = .59$. However, in contrast to hypothesis 3, self-reported challenge did not significantly differ across conditions ($M_{\text{Rare}} = 4.56, SD = 1.13, M_{\text{Pervasive}} = 4.11, SD = 1.12$), $t(56) = 1.51, p = .137, 95\% \text{ CI} [-.15, 1.05], d = .40$. In addition, in the rare condition, participants reported significantly more challenge ($M = 4.56, SD = 1.13$) than threat ($M = 3.49, SD = 1.39$), $t(56) = 2.50, p = .015, 95\% \text{ CI} [.22, 1.94], d = .85$. However, threat ($M = 4.27, SD = 1.24$) and challenge ($M = 4.11, SD = 1.12$) did not vary significantly in the pervasive condition across the two time points, $t(56) = .40, p = .690, 95\% \text{ CI} [-.63, .95], d = .14$ (see Figure 5.1). Although it is

not entirely legitimate to compare levels of threat and challenge emotions, given how different these two measures are, it is possible that participants reported similar levels of threat and challenge in the pervasive condition due to uncertainty about how they felt about their ability to cope with the rejection.

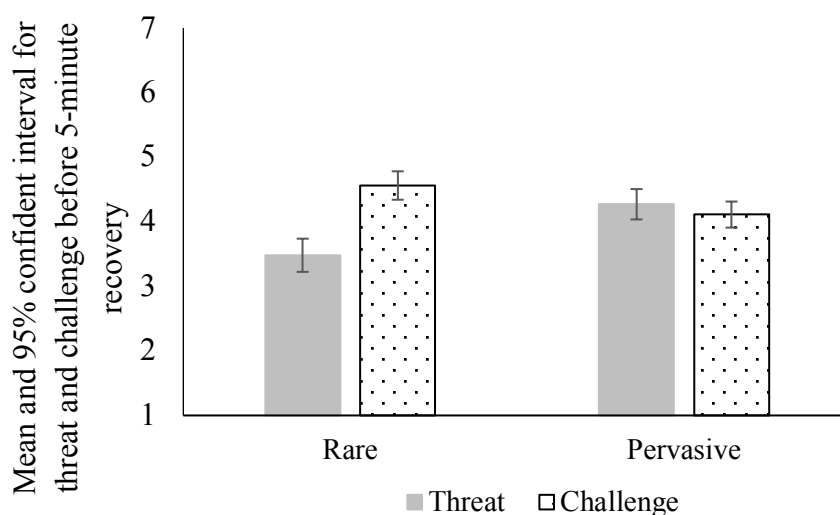


Figure 5.1. Threat and challenge before the recovery period

No other significant effect was found on this analysis (main effect of type of emotion, $F(1, 55) = 2.49, p = .120, \eta_p^2 = .043$, main effect of pervasiveness, $F(1, 55) = 1.40, p = .242, \eta_p^2 = .025$).

Threat versus challenge after the recovery period. A 2 x 2 repeated measures MANOVA revealed a significant main effect of type of emotion, $F(1, 55) = 129.51, p < .001, \eta_p^2 = .702$, which was qualified by a significant interaction between type of emotion and pervasiveness, $F(1, 55) = 5.69, p = .021, \eta_p^2 = .094$. The main effect of condition (pervasiveness) was not significant, $F(1, 55) = 1.88, p = .177, \eta_p^2 = .033$. As displayed in Figure 5.2, reported challenge did not vary significantly across conditions ($M_{Rare} = 4.83, SD = .95, M_{Pervasive} = 4.50, SD = 1.05$), $t(56) = 1.22, p = .22, 95\% \text{ CI } [-.21, .87], d = .33$, but in line with hypothesis 1, participants reported significantly more threat when discrimination was pervasive ($M = 3.07,$

$SD= 1.21$) than when it was rare ($M= 2.24$, $SD= .83$), $t(56) = 2.96$, $p= .005$, 95% CI $[-.21, .87]$, $d= .80$. As a result, although participants in both conditions reported more challenge than threat emotions, the difference between threat and challenge emotions was greater when discrimination was rare than when it was pervasive (see Figure 5.2).

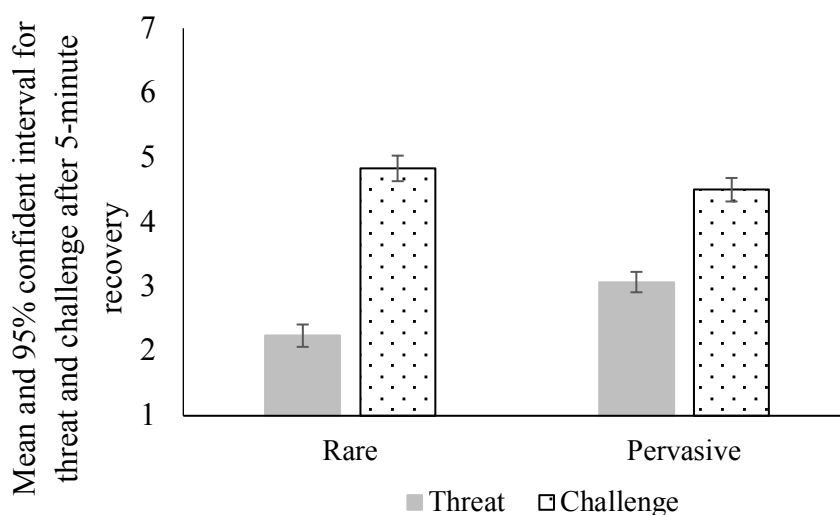


Figure 5.2. Threat and challenge after the recovery period

Threat and challenge across time. For each emotion scale, a 2 x 2 ANOVA was conducted with time (before vs. after recovery) as a within participants factor and condition (pervasive vs. rare) as a between participants factor. Regarding threat, the analysis revealed a significant effect of time, $F(1, 55) = 159.97$, $p < .001$, $\eta_p^2 = .744$, indicating that participants reported less threat after ($M= 2.25$ $SD= .94$) than before ($M= 3.91$ $SD= 1.36$) the recovery period. The effect of condition was significant too, revealing that participants in the rare condition reported less threat ($M= 2.68$, $SD= .95$) than participants in the pervasive condition ($M= 3.42$, $SD= 1.04$), $F(1, 55) = 7.72$ $p = .007$, $\eta_p^2 = .123$. However, the interaction between condition (pervasiveness) and time was not significant, $F(1, 55) = .127$, $p = .72$, $\eta_p^2 = .002$. That is, the effect of pervasiveness was valid at both time points (see Figure 5.3)

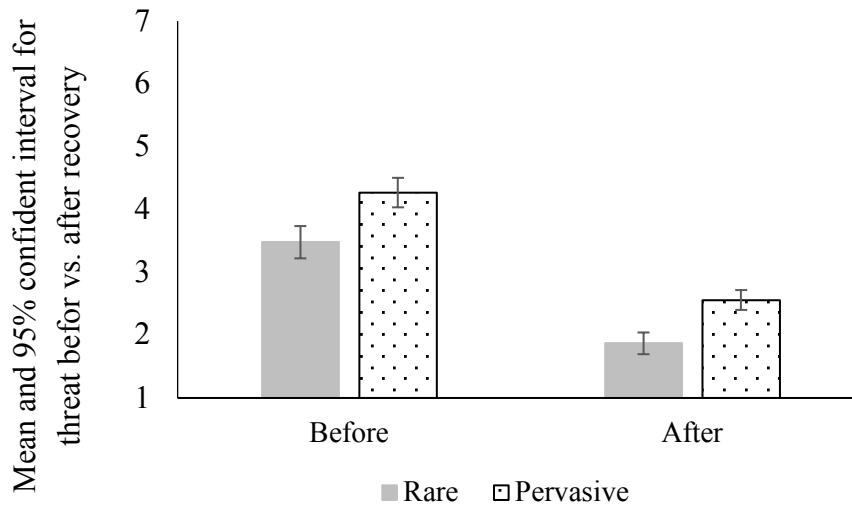


Figure 5.3. Threat before and after the recovery period

Regarding challenge, the 2 x 2 repeated measures MANOVA revealed a significant effect of time, indicating that participants reported more challenge after ($M= 4.65, SD= 1.02$) than before ($M= 4.32, SD= 1.14$) the 5-minute recovery period, $F(1, 55) = 12.447, p = .001, \eta_p^2= .185$. Although effect of pervasiveness was not significant, $F(1, 55) = 2.13, p = .15, \eta_p^2= .037$, the direction of means suggest that more challenge reported in the rare ($M= 4.31, SD= 1.03$) than in the pervasive ($M= 4.7, SD= .99$) condition. There was no significant interaction, $F(1, 55) = .401, p = .53, \eta_p^2= .007$, reflecting the fact that this tendency was similar at both time points (see Figure 5.4).

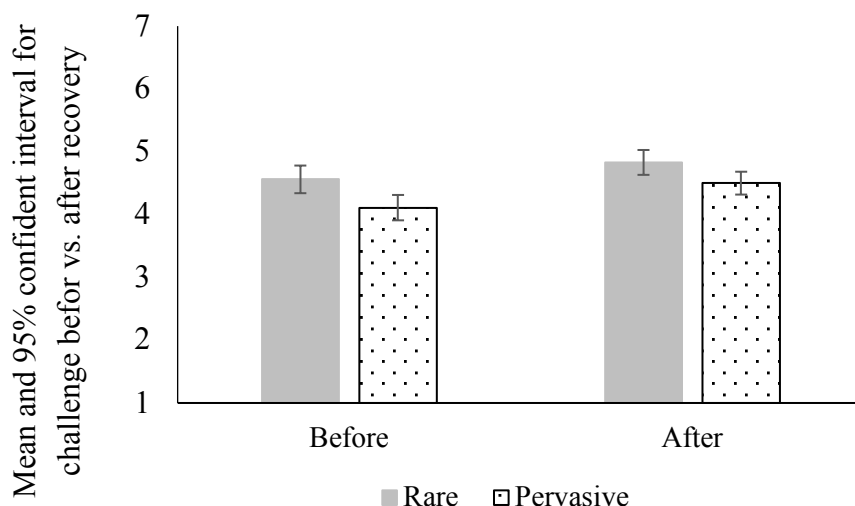


Figure 5.4. Challenge before and after the recovery period

All in all, our analyses demonstrated that there is a significant effect of time (pre-post recovery period) on self-reported threat emotions, suggesting that participants in both conditions, and as would be expected, reported significantly less threat after recovery than before. However, the effect of condition on threat emotions remained reliable after the recovery period, so that in both periods participants in the pervasive (stable) condition reported significantly more threat than participants in the rare (unstable) condition.

Subjective appraisals of speech delivery task. A multivariate ANOVA with condition as a between participants factor revealed no significant effects of pervasiveness on any of the items used to assess appraisals of the speech delivery task (stress: $F(1, 55) = 2.1, p = .153, \eta_p^2 = .037$, effort: $F(1, 55) = 2.31, p = .134, \eta_p^2 = .040$; performance: $F(1, 55) = .49, p = .487, \eta_p^2 = .009$). The grand means for stress and effort were relatively high, reflecting that participants reported feeling stressed ($M = 5.07, SD = 1.27$) and putting effort ($M = 4.98, SD = 1.16$) into the task, as intended for a motivated performance task. The means for subjective performance were relatively low, again reflecting the relative difficulty of the task, as intended ($M = 3.11, SD = 1.24$). Looking at the direction of the means, however, suggests that scores for

reported stress and effort were slightly higher in the pervasive condition (stress: $M= 5.30$, $SD= 1.22$; effort: $M= 5.19$, $SD= 1.05$) than in the rare condition (stress: $M= 4.80$, $SD= 1.3$; effort: $M= 4.73$, $SD= 1.25$), which is consistent with the higher threat expected in the pervasive condition.

Correlations. Table 5.2 displays the inter-correlations between all measured variables. Of note are, in particular, the correlations between emotions and attributions. The only significant correlation to emerge was that between attributions to ability and threat. Specifically, attributions to ability were positively and significantly associated with threat reported before the speech task ($r= .28$, $p= .03$).

Table 5.2

Correlations between the self-reported dependent variables

	1	2	3	4	5	6
1. Threat before	-					
2. Threat after	.69***	-				
3. Challenge before	-.64***	-.56***	-			
4. Challenge after	-.51***	-.48***	.8***	-		
5. Attributions to ability	.28*	.07	-.25 †	-.05	-	
6. Attributions to gender bias	-.05	-.14	.05	.00	-.24 †	-

 † < .08. * $p < .05$. ** $p < .005$. *** $p < .001$

5.1.3 Results of Cardio-Vascular Responses

Following well-established guidelines (see Blascovich, Spencer, Quinn, & Steele, 2001; Blascovich et al., 2011) I analysed CV responses in three steps. First, I examined possible differences between conditions during the last minute of the baseline period. This baseline period occurred before the manipulation, thus, CO, HR, PEP, and TPR should not significantly differ across the conditions. Second, after creating reactivity scores (i.e., difference scores representing the difference between task and baseline) I tested for task-engagement by testing HR and PEP reactivity against zero (i.e., baseline). Finally, to examine the hypothesis, I tested whether the independent variables affected CV responses indicative of challenge and threat. To this end I tested for between-condition differences in CO and TPR as well as a combined threat-challenge index (TCI).

Mean levels of HR (Heart Rate), PEP (Pre-Ejection Period), CO (Cardiac Output), and TPR (Total Peripheral Resistance) were calculated for the last minute of the baseline, the last minute of preparation time before the speech, and the first minute of the actual speech. A multivariate ANOVA revealed that there was no reliable effect of condition (pervasiveness) on baseline HR, $F(1, 55) = .02, p = .904, \eta_p^2 < .001$, baseline CO, $F(1, 55) = 1.67, p = .201, \eta_p^2 = .030$, and baseline PEP, $F(1, 55) = .662, p = .419, \eta_p^2 = .012$. Surprisingly, however, there was a reliable effect of condition for baseline TPR $F(1, 55) = 4.49, p = .039, \eta_p^2 = .075$, even though the manipulation was not yet in place at this time, $M_{\text{Rare}} = 2382.48, SD = 1020.74; M_{\text{Pervasive}} = 1894.06, SD = 713.80$. To control for this baseline difference in TPR, we used baseline TPR scores as covariate in the analysis of TPR reactivity.

Then, I computed difference scores for each CV measure, to reflect the difference during the last minute of preparation or first minute of the speech and the last minute of the baseline period. More specifically, baseline scores of a particular measure were subtracted from preparation scores and from task scores. The resulting difference scores were then examined

for outliers, which are here defined as values 3.3 SD greater or smaller than the mean (Scheepers, Röell, Ellemers, 2015). These outliers were changed to a value of 1% higher/lower than the adjacent non-outlying value (see Weisbuch-Remington, Mendes, Seery, & Blascovich, 2005; Van Beest & Scheepers, 2013). In addition to considering CO and TPR as separate indicators of challenge and threat motivation states I also calculated a combined Threat-Challenge Index (TCI) for both the preparation and speech periods. To calculate the TCI, first I transformed CO and TPR into Z scores, multiplied TPR by -1, and added these scores ($TCI = Z_d_TPR + Z_d_CO$; Blascovich, Seery, Mugridge, Norris, & Weisbuch, 2004). Higher TCI indicates stronger challenge whereas lower TCI indicates stronger threat (Scheepers et al., 2015).

Task engagement. One-Sample *t*-tests, testing HR and PEP reactivity scores against zero (i.e., baseline), indicated that during the preparation period, only HR, $t_{HR}(56) = 4.24, p < .001, 95\%$ CI, [1.46, 4.08], $d = .56$, was significantly different from baseline ($M_{HR} = 2.77, SD_{HR} = 4.93$), whereas PEP was not, $t_{PEP}(56) = -0.63, p = .534, 95\%$ CI, [-2.43, 1.28], $d = -.08, (M_{PEP} = -.58, SD_{PEP} = 6.99)$. There is thus some evidence for engagement during the preparation period, but only a moderate engagement.

One-Sample *t*-tests were carried out on HR and PEP reactivity during the speech task. During this period all indicators were different from baseline, revealing strong evidence for task engagement: $t_{HR}(56) = 13.56, p < .001, 95\%$ CI, [10.03, -4.28] ($M_{HR} = 11.77, SD = 6.55$), $d = 1.8, t_{PEP}(56) = -5.646, p < .001, 95\%$ CI, [-8.99, -4.28] ($M_{PEP} = -6.63, SD = 8.87$), $d = -.75$.

Condition effects. Two separate analyses were conducted to examine the effects of pervasiveness on CO and TPR during the preparation time (Hypotheses 2 and 4). An ANOVA revealed no significant effect of pervasiveness on CO, $F(1, 55) = .12, p = .727, \eta_p^2 = .002$. An ANCOVA for TPR reactivity scores (preparation-baseline), controlling for baseline TPR,

revealed no significant effect of baseline TPR as covariate, $F(1, 54) = 1.85, p = .179, \eta_p^2 = .033$.

The effect of stability on TPR was not significant either, $F(1, 54) < .001, p = .983, \eta_p^2 < .001$.

I tested the absolute pattern of CV reactivity scores for each condition during preparation period. As can be seen in table 6.5, the results of the one-sample t -tests indicated no increase or decrease in CO and TPR for each condition during preparation time. This indicates no clear signs of CV reactivity in line with threat or challenge during speech preparation, $p > .310$ (see Table 5.3).

Table 5.3

The reported t -tests tested absolute patterns for absolute pattern during preparation time for each condition against zero (i.e., baseline)

Discrimination	Pervasive		Rare	
	CO	TPR	CO	TPR
$M (SD)$.03 (.48)	-10.59 (184.85)	.07 (.35)	-32.72 (224.89)
95% CI	-.14, .21	-78.39, 57.21	-.07, .21	-123.55, 58.12
t	.36	-.32	1.04	-.74
d	.06	-.06	.2	-.15

* $p < .05$. ** $p < .005$. *** $p < .001$

Regarding condition effects during speech itself, two separate analyses were ran for CO and TPR. The ANOVA for CO did not show a significant effect of pervasiveness on CO, $F(1, 55) = .38, p = .541, \eta_p^2 = .007$. For TPR during speech delivery task an ANCOVA (controlling for TPR at baseline) did not show a significant effect of baseline TPR, $F(1, 54) = 2.28, p = .137, \eta_p^2 = .040$. The effect of stability on TPR was not statistically significant either, $F(1, 54) = .38, p = .538, \eta_p^2 = .007$.

In addition to testing for relative differences between conditions in CV reactivity indicative for challenge or threat, I also tested for *absolute* patterns of challenge and threat during the speech in the separate conditions (Table 5.4). Surprisingly, in contrast to what self-reported data suggested, in the pervasive condition, there is a pattern in line with challenge. More specifically, there was significant decrease in TPR and increase in CO was compared with baseline. Regarding the rare condition, although there is a significant increase in CO compared to the baseline, decrease in TPR is not statistically significant, $p = .117$. The pattern of the means is also partly in line with CV reactivity of challenge, which is in line with my expectation (Hypothesis 4a).

Table 5.4

The reported t-tests tested absolute patterns for absolute pattern during speech delivery for each condition against zero (i.e., baseline)

Discrimination	Pervasive		Rare	
	CO	TPR	CO	TPR
<i>M (SD)</i>	.49 (.66)	-150.24(279.88)	.38 (.65)	-130.84 (410.65)
95% CI	.25, .73	-252.90, -47.58	.12, .65	-296.70, 35.02
<i>t</i>	4.17 ***	-2.99***	3.01*	-1.63†
<i>d</i>	.74	-.54	.59	-.32

† < .120. * $p < .05$. ** $p < .005$. *** $p < .001$

Threat-Challenge Index for preparation and speech delivery (TCI). Two separate ANCOVAs examined the effects of condition on the TCI indexes, with baseline TPR as covariate. These tests revealed only a significant effect of baseline TPR for TCI during preparation time $F(1, 54) = 5.24, p = .026, \eta_p^2 = .088$. The main effect of pervasiveness on TCI during preparation time was not significant, $F(1, 54) = .32, p = .575, \eta_p^2 = .006$.

The ANCOVA for TCI during speech also revealed a significant effect of baseline TPR, $F(1, 54) = 7.57, p = .008, \eta_p^2 = .123$, but no significant main effect of pervasiveness, $F(1, 54) = .08, p = .774, \eta_p^2 = .002$.

5.1.4 Correlations between CV indicators and self-reports.

Table 5.5 displays correlations between CO Prep/speech task, TPR Prep/ speech task, TCI Prep/ speech task, and self-reported threat before/after, challenge before/after and attributions. No significant correlations have been found between CV indicators and self-reported measures.

Table 5.5

Correlations between CV markers and self-reported measures for Study 2a

	1	2	3	4	5	6
1. CO Prep	-					
2. TPR Prep	-.62***	-				
3. CO SPD	.59***	-.32*	-			
4. TPR SPD	-.331*	.64***	-.62***	-		
5. TCI Prep	-.43**	-.43**	-.32*	-.34*	-	
6. TCI SPD	-.30*	-.35*	-.44**	-.44**	.75***	-
7. Attributions to ability	-.08	.04	-.23†80	.020	.04	.04
8. Attributions to discrimination	.09	.09	.07	.19	-.21	-.30*
9. Threat before	-.10	.02	-.01	.02	.09	-.02
10. Threat after	.03	.004	.07	-.09	-.04	.02
11. Challenge before	.17	-.12	.21	-.18	-.06	-.04
12. Challenge after	.15	-.12	.13	-.08	-.03	-.07

*** $p < .001$, ** $p < .005$, * $p < .05$, † $< .10$

5.1.5 Discussion

This study aimed to investigate the extent to which attributions to discrimination are experienced as threatening as a function of the perceived pervasiveness of these attributions. Researchers have argued that people might, at times, be inclined to make attributions to discrimination to protect themselves from threatening experiences (Crocker & Major, 1989; Major et al., 2003). Others have argued, however, that attributions to discrimination might not help avoid threat, since they are highly threatening as well, particularly if discrimination is perceived as pervasive (Schmitt et al., 2003). Although these assumptions have guided a large body of research on the effects of stigma, they have not yet been directly tested. In this study, I aimed to contribute to this discussion by directly testing whether the extent to which attributions to discrimination are experienced as threatening is affected by the perceived pervasiveness of discrimination, so that more threat is experienced when individuals attributed a negative outcome to discrimination and discrimination is perceived as pervasive rather than rare. I also measured attributions to lack of ability to allow me to explore the association between these and experiences of threat or challenge.

The results of this study indicated some interesting and encouraging findings. In line with the hypothesis, participants in the pervasive condition reported more threat, both before and after the recovery period, than participants in the rare condition. Task appraisals established that, as intended, in the motivated performance task all participants felt fairly stressed and were invested in the task and revealed a tendency for greater stress and effort to be reported in the pervasive condition. Cardiovascular responses, however, revealed some evidence of the contrary effects. Specifically, although condition did not affect cardiac output (CO) and peripheral vascular resistance (TPR), surprisingly, in the pervasive condition CO and TPR indexes were significantly different from the baseline (during the speech delivery) in a direction indicative of challenge.

In addition, although I did not expect to find effects of condition on attributions in this study, results for this measure are consistent with my theoretical model. That is, I intended to guide participants to make attributions to discrimination in all conditions, so I expected to find that attributions would not vary across conditions. Interestingly, however, the results revealed that even in a relatively unambiguous context as the one I attempted to create, participants adjusted their attributions in ways that might be experienced as less threatening. Specifically, although participants acknowledged the role of discrimination to a similar extent across conditions, and even though participants did not receive any information that might directly influence attributions to lack of ability, they were more inclined to make attributions to lack of ability when they were told that discrimination was pervasive than when they were told that discrimination was rare. One explanation for this is that participants were more willing to make attributions to lack of ability to avoid the threat of attributions to discrimination, i.e., when discrimination was perceived as pervasive. However, when discrimination was perceived to be rare, they were less willing to blame their lack of ability for the negative outcome, probably because attributions to ability are threatening too—as also supported by the correlation we found between attributions to ability and self-reported threat. That is, when discrimination against one's group is perceived to be pervasive, maybe attributing a negative outcome to discrimination is so threatening that people prefer to make an alternative attribution (which is presumably less threatening in that context). In this situation, attributions to lack of ability might actually play a self-protective role. If so, these findings are contradictory with what Crocker and Major (1989) claimed. Although this study does not directly compare how threatening each attribution is, results show that there are circumstances (i.e., when discrimination is perceived as pervasive) when people might actually prefer to make attributions to lack of ability than to discrimination.

Although the results are interesting, they are generally weak. The most important reason for this is the low sample size in this study. It is also possible that the manipulation was not sufficiently successful. Indeed, the manipulation checks did not reveal a reliable effect of the manipulation. This might be due to several reasons. First, differential attrition can be a reason why the manipulation of pervasiveness of discrimination was not sufficiently successful, as almost twice more participants were excluded from stable condition compared with excluded participants in the unstable condition. In addition, it is possible that the manipulation checks I used, i.e., public collective self-esteem, were too far removed from the focus of the manipulation to reveal its effects. Specifically, the manipulation checks focused on the pervasiveness of gender bias in society, whereas the manipulation placed greater stress on the number of interviewers who were biased. Even though we attempted with this manipulation to connect to the stability of bias in society at large, this aspect may have been less salient to participants. Second, it may have been that not all participants heard or understood the manipulation well. The manipulation was delivered orally by the experimenter (myself), and it is possible that this was not always equally audible, or clearly stated. Lastly, as a young female and non-British researcher, it is possible that I was not regarded as a sufficiently credible source of information about the pervasiveness of bias in British society.

Despite these limitations, this first study offers some support for the ideas proposed in this thesis, i.e., that the extent to which a particular attribution for a negative outcome is threatening depends on how stable it is. The next study further examined this question with regard to attributions to lack of ability.

5.2 Experiment 2b

This experiment focused on attributions of a negative outcome to lack of ability. The goal of this experiment was to test the same hypotheses outlined in the introduction of this

chapter, applied to stability of ability (see page 70). In short, hypothesis 1 refers to an expected effect on threat emotions, hypotheses 2a and 2b refer to physiological patterns of threat and expected condition effects, hypothesis 3 refers to expected effects on challenge emotions, and hypotheses 4 and 4b to physiological patterns of challenge and expected condition effects. In addition, in line with the importance of this emotion in the literature on implicit theories of ability, I measured self-reported helplessness in this study 2b and expected that participants would report more helplessness when ability was described as fixed than when it was described as malleable (hypothesis 5).

5.2.1 Method

Design and participants. The design of the experiment was the same as that of experiment 2a, with the exception of the attribution participants were guided to make. Participants were exposed to a negative outcome, which was attributed by the experimenter to fixed (stable) vs. malleable (unstable) ability. As such, this experiment contained one between-participants factor with two levels: Participants were randomly allocated to either the fixed (stable) or to the malleable (unstable) conditions. A total of 66 female participants (age from 18 to 36, $M=20.72$, $SD=2.64$) took part in this experiment. Data from a total of 12 participants were excluded from the analyses due to technical difficulties: One participant was excluded from the self-reported data analyses due to not having 5-minute baseline data and 11 participants were excluded from the self-report data analyses due to a variety of problems with the collection of psychophysiological data, such as technical difficulties. This was mainly due to losing data at different stages of the study especially during speech task. Because of participants' movement during speech task, electrodes detached and the data was lost. In other cases, ICG wave was unscorable (poor ICG waves with unclear b and x points, or loose electrodes). Analyses, thus, were conducted on the 54 remaining participants. Of these 12 excluded participants, 6 were in the stable condition (17.65% of participants in this condition),

and 6 were in the unstable condition (18.75% of participants in this condition). (28 participants in the fixed condition and 26 participants in malleable condition). Power analyses for sample size were not conducted prior to the experiment.

Procedure. The procedure was the same as in experiment 2a because we wanted to render these two experiments as comparable as possible. However, the manipulation in this experiment was different from the manipulation in the experiment 2a because in this experiment we manipulated stability of ability.

Pilot study. Since in this experiment I focused on the ability to do well in job interviews and prior research on implicit theories of ability has not focused on this type of ability, I piloted the manipulation. I adapted existing manipulations (mainly manipulating the stability of intelligence) to refer to the ability to do well in job interviews (see Appendix B for the full wording of the materials used in the pilot). A total of 40 female participants took part in this pilot study. Participants were students at the University of Exeter and were approached around the campus. Participants read one of the two scenarios (stable/fixed vs. unstable/malleable; between participants; 20 participants read the stable/fixed scenario and 20 participants read the unstable/malleable one) and answered three questions regarding the stability of the ability to do well in job interviews ($\alpha = .92$). Participants who read the stable scenario found ability more stable ($M_{\text{Fixed}} = 4.82$, $SD = 1.71$) than participants who read the unstable scenario ($M_{\text{Malleable}} = 3.45$, $SD = 1.4$), $F(1, 38) = 2.68$, $p = .009$, $\eta_p^2 = .168$. Participants also provided open descriptions about what they think that science says about one's ability to do well in job interviews. Participants' open descriptions drew our attention to some improvements that could be made in the manipulation text. Thus, I adjusted the text to improve its clarity.

Main study. As indicated, I followed the same procedure as in study 2a. After receiving the negative feedback, in the malleable ability condition the experimenter stated that "let's see

what the interviewer says. You know, this is actually what I do research on—I study how people do in job interviews. What the literature says is very clear: This sort of thing is something you can work on. Doing well in a job interview is not at all related to something fixed, like your personality. It's really mainly a question of having the right environment and learning the right skills. Each time you learn something and improve. This means that training can really help to improve interview skills. This is what science says, and my research is showing this too.”

In contrast, in the fixed ability condition, the experimenter stated “let's see what the interviewer says. You know, this is actually what I do research on—I study how people do in job interviews. What the literature says is very clear: This sort of thing, you either have it or you don't. Doing well in a job interview is really more about your personality—your nature or temperament. So it's not something one can learn. So, if you do well, then you always do well, but if you do poorly, well, it's really hard to ever get better. This means that training does not really help, your ability to do well in interviews is something that some people have and others just don't. This is what Science says, and my research is showing this too.”

Measures. Throughout the experimental session I again measured CV indices to differentiate challenge from threat (HR, PEP, CO, and TPR). Moreover, I also used the same measures in the same order as in the experiment 2a with only a few changes (see Appendix B for the full questionnaire). After participants heard the comments regarding stable vs. unstable ability to do well in a job interview and received the evaluation form, they answered questions about what the outcome had been (checks) and attribution questions. Participants answered emotion questions twice during the experiment: Before and after the recovery period. After the recovery period, participants also answered questions regarding the speech delivery task and manipulation checks.

Attributions. Attributions were assessed with the same questions as in Experiment 2a to establish that, in this study, participants made more attributions to ability than to discrimination in both conditions. The two items that were used to assess attributions to ability formed a reliable scale ($r = .63$), and were averaged for further analyses. Two items used to measure attributions to gender bias also formed a reliable scale and were averaged for further analyses ($r = .77$).

Emotions. As in study 2a, I asked participants to rate how they felt on 12 threat and challenge related emotions twice during the experiment: Before and after the recovery period. However, in this experiment we added “helpless”, which is an emotion that is key in research on implicit theories of ability and often associated with situations where negative outcomes are attributed to fixed/stable lack of ability. This emotion was analysed separately from the threat and challenge scales. Regarding threat before and after recovery, after recoding the positive emotions (calm and relaxed) the items formed reliable scales ($\alpha_{\text{before}} = .85$, $\alpha_{\text{after}} = .84$) and were averaged for the analyses. With regard to challenge before and after the recovery, after recoding the negative emotions (discouraged, low, disappointed, and sad) and excluding item “challenged” the remaining items formed reliable scales ($\alpha_{\text{before}} = .80$, $\alpha_{\text{after}} = .85$) and were averaged for analysis. The item “challenged” was excluded due to the realisation that its meaning was ambiguous to our participants.

Speech delivery appraisals. To shed further light into whether the motivated performance task was appraised as such by participants, in addition to the three speech delivery appraisals that were used in Experiment 2a, I included three more questions. Specifically, I asked participants to think back to the time before delivering the speech and report what they felt at that time. For example “If you think back to the moments just **before** you delivered your speech, to what extent did you feel stressed about doing this speech?”

Manipulation checks. I checked the manipulation of stability of ability by adapting three questions used by Dweck, Chiu, and Hong (1995) to measure implicit theories of intelligence, such as “To what extent do you think that you have a certain amount of ability to do well in job interviews and you really can't do much to change it?” ($\alpha = .85$; the higher the means, the more fixed/stable ability is perceived to be).

Cardiovascular responses. Again, I collected cardiovascular responses continuously during the experiment by measuring Impedance Cardiography (ICG), Electrocardiography (ECG), and continuous blood pressure (BP), in the same way as indicated in study 2a.

5.2.2 Results of Self-Reported Measures⁴

Manipulation checks. An ANOVA on the manipulation check revealed a significant effect of condition, $F(1, 52) = 3.93, p = .053, \eta_p^2 = .070$, showing that, as intended, participants in the malleable condition perceived ability to be more changeable ($M_{\text{Malleable}} = 2.73, SD = 1.33$) than participants in the fixed condition ($M_{\text{Fixed}} = 3.48, SD = 1.42$). I can, therefore, consider the manipulation to have been successful.

Attributions. A 2 (Type of attribution: Lack of ability vs. Gender bias) x 2 (Condition: Fixed vs. Malleable) MANOVA with repeated measures on the first factor was conducted to compare attributions to ability and to bias across conditions. The result indicated a significant effect of locus of attribution, $F(1, 52) = 67.56, p < .001, \eta_p^2 = .565$. As can be seen in Table 5.5, participants made significantly more attributions to ability than to bias in both the malleable, $t(53) = 6.23, p < .001, 95\% \text{ CI } [2, 3.98], d = 2.08$, and the fixed condition, $t(53) = 5.38, p < .001$,

⁴ After analysing data from all of the available data in self-reports the results indicated a very similar direction as the result reported here: A significant effect of stability on manipulation checks indicating that the manipulation was successful, $p < .001$, significant effect of time on attribution indicating that, as intended, participants made more attributions to lack of ability than to gender discrimination, $p < .001$, significant interaction between emotions before the recovery period and stability of ability indicating that participants reported more threat in the unstable than in the stable condition, $p = .018$, significant effect of time on emotions after the recovery period indicating that participants reported significantly more challenge than threat after the recovery period, $p < .001$, and finally a significant effect of time on helplessness indicating participants reported more helpless before than after the recovery period, $p = .025$.

95% CI [1.53, 3.36], $d = .69$. This was as intended in this study. Participants' attributions to ability and to bias did not differ across conditions (see Table 5.5).

Table 5.6

Means and SDs of attributions to lack of ability and to bias

Stability/Locus	Ability	Bias
Malleable	5.27 (1.40) ^a	2.33 (1.43) ^b
Fixed	4.84 (1.81) ^a	2.39 (1.38) ^b

No other reliable effects were found: Effect of stability $F(1, 52) = 0.52, p = .474, \eta_p^2 = .010$; interaction between locus and stability $F(1, 52) = 0.57, p = .453, \eta_p^2 = .011$.

Emotions. Threat and challenge emotions were analysed in two ways: By comparing threat with challenge emotions within each period of time, and by comparing each emotion scale across time (before vs. after). The emotion 'helpless' was analysed separately and compared across time.

Threat versus challenge before the recovery period. I ran a 2 (threat vs. challenge) x 2 (fixed vs. malleable) MANOVA with repeated measures on the first factor to test hypotheses 1 and 3. This analysis revealed a significant interaction between type of emotion and stability, $F(1, 52) = 6.04, p = .017, \eta_p^2 = .104$. This interaction reflected the fact that—contrary to my expectations—participants reported more threat and less challenge in the malleable than in the fixed condition. That is, participants in the malleable ability condition ($M = 4.48, SD = 1.28$) reported significantly more threat than participants in the fixed ability condition ($M = 3.67, SD = 1.21$), $t(53) = 2.37, p = .021, 95\% \text{ CI } [.126, 1.49], d = .65$ (contradictory to Hypothesis 1). However, more challenge was reported among participants in the fixed ability condition ($M = 4.28, SD = 1.10$) than participants in the malleable condition ($M = 3.61, SD = 1.30$), $t(52) = 2.05,$

$p = .046$, 95% CI [-1.33, -.01], $d = .56$ (contradictory to Hypothesis 3). Moreover, participants in the malleable ability condition reported more threat ($M = 4.48$, $SD = 1.28$) than challenge ($M = 3.61$, $SD = 1.30$), $t(52) = 2.01$, $p = .050$, 95% CI [.0, 1.74], $d = .67$, whereas they did not differentiate between threat ($M = 3.67$, $SD = 1.21$), and challenge ($M = 4.28$, $SD = 1.10$) in the fixed ability condition, $t(52) = -1.46$, $p = .150$, 95% CI [-1.45, .23], $d = .53$ (see Figure 5.5).

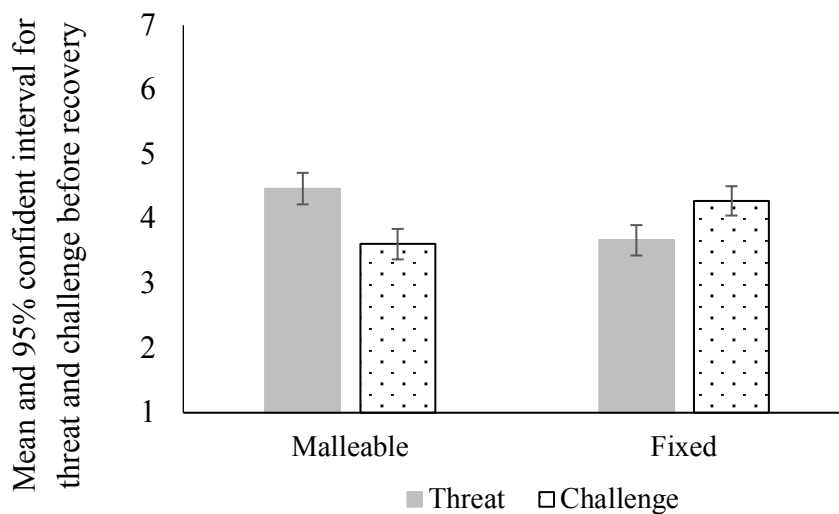


Figure 5.5. Emotions before the recovery period

No other significant effects were revealed: Effect of type of emotion (threat vs. challenge), $F(1, 52) = .187$, $p = .667$, $\eta_p^2 = .004$, and effect of stability, $F(1, 52) = .219$, $p = .642$, $\eta_p^2 = .004$.

Threat versus challenge after the recovery period. A 2 x 2 MANOVA with repeated measures on the last factor revealed a significant main effect of type of emotion, $F(1, 52) = 29.71$, $p < .001$, $\eta_p^2 = .364$ indicating that in general participants reported more challenge ($M = 4.33$, $SD = 1.22$) than threat ($M = 2.79$, $SD = 1.08$) after the recovery period. However, it revealed no significant main effect of stability $F(1, 52) = .855$, $p = .359$, $\eta_p^2 = .016$, and no significant interaction between type of emotion and stability, $F(1, 52) = .407$, $p = .526$, $\eta_p^2 = .008$. This

reflects the fact that, after the recovery period, participants reported more challenge than threat, irrespective of condition (see Figure 5.6).

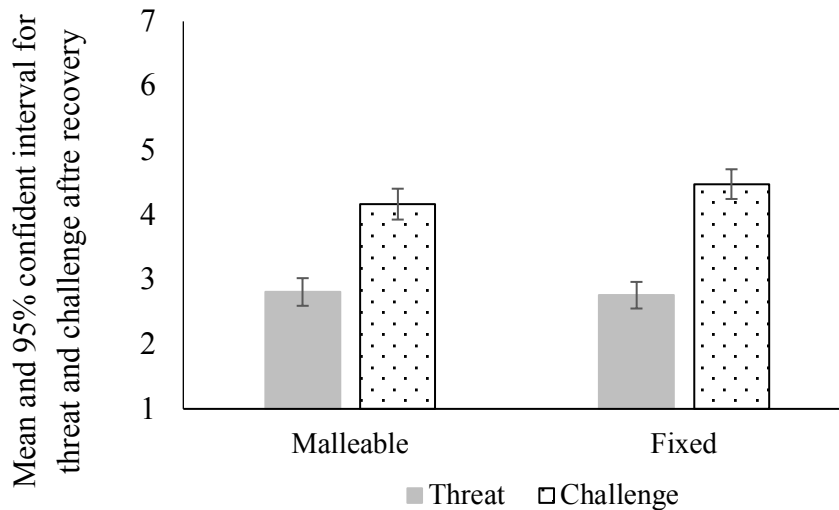


Figure 5.6. Emotions after the recovery period

Threat and challenge across time. To understand effects of time (before vs. after the recovery) on emotions (threat vs. challenge), we ran a 2 x 2 multivariate ANOVA for each emotion, with time as a within participants variable and condition as a between participants variable. Regarding threat emotions, the results revealed a significant effect of time, $F(1, 52) = 76.86, p < .001, \eta_p^2 = .596$, which was qualified by a significant interaction between time and stability, $F(1, 52) = 6.63, p = .01, \eta_p^2 = .113$. No significant effect of stability was found, $F(1, 52) = 2.29, p = .136, \eta_p^2 = .042$. This result indicated that in total participants reported less threat after the recovery period ($M = 4.06, SD = 1.30$) than before, ($M = 2.79, SD = 1.08$). In addition, the interaction revealed that before the speech, reported threat was higher in the malleable condition ($M = 4.24, SD = 1.28$) than fixed condition ($M = 3.67, SD = 1.21$), $t(52) = 2.51, p = .021$, 95% CI [.13, 1.49], $d = .65$. However, after the recovery period, there was no significant difference in reported threat between malleable ($M = 2.82, SD = .93$) and fixed condition ($M = 2.77, SD = 1.22$), $t(52) = .17, p = .864$, 95% CI [-.55, .65], $d = .05$ (see Figure 5.7).

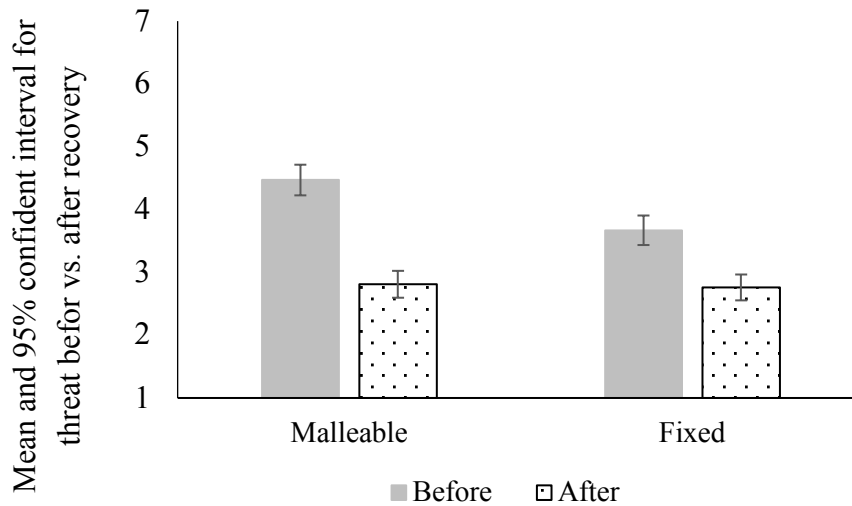


Figure 5.7. Threat before and after the recovery period

Regarding self-reported challenge, the 2 x 2 repeated measures MANOVA revealed a significant effect of time, $F(1, 52) = 13.72, p = .001, \eta_p^2 = .209$. This result demonstrated that participants reported significantly more challenge after the recovery ($M = 4.33, SD = 1.22$) than before ($M = 3.96, SD = 1.24$). Although the interaction between time and stability was not statistically significant, $F(1, 52) = 3.06, p = .086, \eta_p^2 = .055$, participants in the malleable condition reported significantly more challenge after the recovery ($M = 4.17, SD = 1.19$) than before ($M = 3.61, SD = 1.30$), $t(52) = 3.79, p < .001, 95\% \text{ CI } [.27, .87], d = .45$; but participants in the fixed condition reported similar levels of challenge before ($M = 4.28, SD = 1.10$) and after the recovery period ($M = 4.48, SD = 1.24$), $t(52) = -1.40, p = .165, 95\% \text{ CI } [-.49, .09], d = .17$ (see Figure 5.8). This analysis did not reveal a significant effect of stability on challenge before vs. after the recovery period, $F(1, 52) = 2.45, p = .123, \eta_p^2 = .045$.

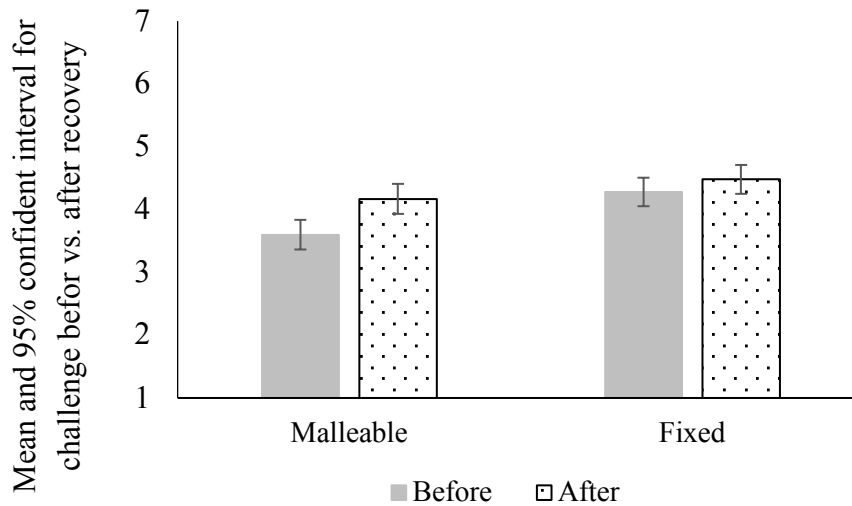


Figure 5.8. Challenge before and after the recovery period

Helplessness before vs. after the recovery period. To test hypothesis 5, I conducted a 2 x 2 MANOVA on feelings of helplessness before and after the recovery (with time varied within participants). This revealed a significant effect of time, $F(1, 52) = 4.45, p = .04, \eta_p^2 = .079$, indicating that, in general, participants reported less helplessness after ($M = 2.49, SD = 1.72$) than before ($M = 2.92, SD = 1.73$) the recovery period. The effect of stability, $F(1, 52) = 3.51, p = .066, \eta_p^2 = .063$, and the interaction were not significant, $F(1, 52) = 1.14, p = .29, \eta_p^2 = .021$. However, participants in the malleable condition ($M = 4.00, SD = 1.60$) reported higher helplessness than participants in the fixed condition, ($M = 2.32, SD = 1.44$; see Figure 5.9). This contradicts hypothesis 5 but is in line with the results on the remaining self-reported emotions.

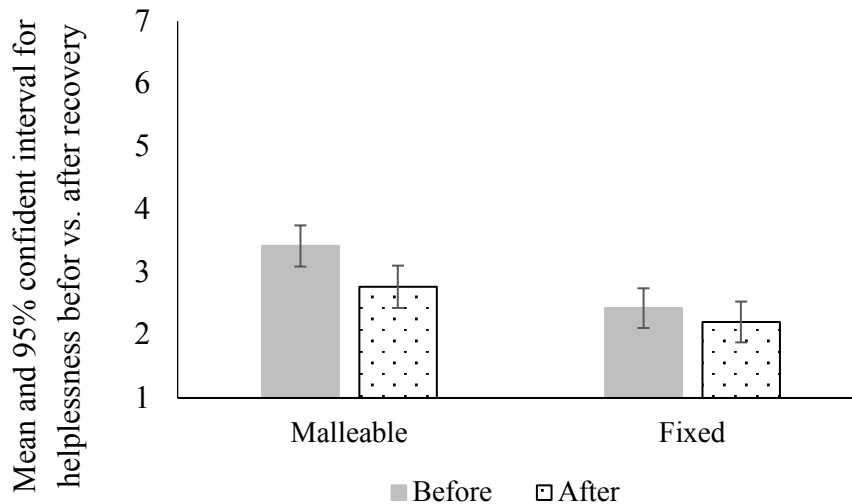


Figure 5.9. Helplessness before and after the recovery period

Subjective appraisals of the speech delivery task. A MANOVA revealed no significant effects of condition on any of the items used to assess appraisals of the speech delivery task, $F_s < 1.34$, $p_s > .252$. Crucially, the means are relatively high, establishing that the speech task was experienced as stressful ($M= 4.80$, $SD= 1.30$) and that participants were equally invested in it in both conditions ($M= 4.33$, $SD= 1.30$), as intended. However, the mean of subjective performance was low, as intended ($M= 3.07$, $SD= 1.40$)

Correlations. Table 5.7 displays the inter-correlations between all self-reported variables. Noteworthy is the significant positive link between attributions to ability and threat reported before ($r= .34$, $p= .012$) and after ($r= .56$, $p < .001$) recovery. As in study 2a, the more participants attributed their rejection to lack of ability, the more threat they reported. This analysis also indicated that threat reported before the recovery period is negatively related to challenge reported before ($r= -.66$, $p < .001$) and after the recovery period ($r= -.56$, $p < .001$).

Table 5.7

Correlations between self-reported dependent variables

	1	2	3	4	5	6
1. Threat before	-					
2. Threat after	.56***	-				
3. Challenge before	-.66***	-.38**	-			
4. Challenge after	-.56***	-.61***	.8***	-		
5. Attributions to ability	.34*	.34*	-.12	-.21	-	
6. Attributions to gender bias	-.12	-.06	.1	.14	-.26†	-

 † < .06. * $p < .05$. ** $p < .005$. *** $p < .001$

5.2.3 Results of Cardio-Vascular Responses

To analyse physiological responses, I followed the same steps as in experiment 2a: First checking for baseline differences, then computing difference scores, followed by testing for task engagement (HR, PEP), and finally testing condition effects on cardiovascular indices of threat and challenge (CO, TPR, TCI).

Baseline differences. A multivariate ANOVA revealed no significant between-condition baseline differences for any of the cardiovascular indicators: $F_{HR}(1, 52) = .011, p = .918, \eta_p^2 < .001$, $F_{CO}(1, 52) = 2.06, p = .157, \eta_p^2 = .038$, $F_{PEP}(1, 52) = .732, p = .396, \eta_p^2 = .014$, $F_{TPR}(1, 52) = .95, p = .333, \eta_p^2 = .018$. As such, we can consider that participants in the two conditions were comparable at baseline. Further analyses were again conducted on difference scores that were created by subtracting mean values during the baseline from mean values during the speech preparation period and speech task respectively.

Task engagement. One-sample *t*-tests tested the difference between HR and PEP reactivity and zero, during speech preparation. This indicated that both HR ($M = 4.47, SD = 7.34$) and PEP ($M = -2.48, SD = 7.32$) reactivity differed significantly from zero: $t(53) = 4.48, p < .001, 95\% CI [2.47, 6.48], d = .61$ for HR, and $t(53) = -2.49, p = .016, 95\% CI [-4.48, -.48], d = -.34$, for PEP respectively. These results provide evidence that participants were engaged when preparing the speech.

One-sample *t*-test for task engagement during the speech task indicated that both HR ($M = 15.13, SD = 9.26$) and PEP ($M = -8.46, SD = 11.06$) were significantly different from zero, $t_{HR}(53) = 12.01, p < .001, 95\% CI [12.6, 17.66], d = 1.63$, $t_{PEP}(53) = -5.62, p < .001, 95\% CI [-11.48, -5.44], d = -.77$. These results provide sufficient evidence that participants were engaged during the preparation period.

Condition effects. To test hypotheses 2 and 4, two separate ANOVAs tested the effects of condition (stability) on CO and TPR reactivity scores during speech preparation. These analyses revealed no significant effects of condition on CO, $F(1, 52) = .01, p = .946, \eta_p^2 < .001$, or on TPR $F(1, 53) = .20, p = .892, \eta_p^2 < .001$.

I also tested absolute patterns of CV reactivity scores of CO and TPR during the speech preparation. One-sample t -test indicated a non-significant increase in CO when ability is malleable ($M = .10, SD = .29$), $t(25) = 1.83, p = .079, 95\% \text{ CI } [-.01, .22], d = .35$. No other significant effect was found, $ps > .163$. None of these findings suggest more threat in one condition than in the other.

Two separate ANOVAs testing the effects of condition (stability) on CO and TPR reactivity during the speech revealed no significant effects: $F_{\text{CO}}(1, 52) = .043, p = .837, \eta_p^2 = .001, F_{\text{TPR}}(1, 53) = .338, p = .564, \eta_p^2 = .006$.

One-sample t -tests were used to test CV reactivity scores against zero (baseline) during the speech for the two conditions separately. As displayed in Table 5.8, this analysis indicated a significant increase in CO in both malleable ($M = .38, SD = .63$), $t(25) = 3.12, p = .005, 95\% \text{ CI } [.13, .64], d = .60$, and fixed ability conditions ($M = .42, SD = .54$), $t(25) = 4.07, p < .001, 95\% \text{ CI } [.21, .63], d = .78$. There were no significant changes in TPR compared to baseline, $ps > .153$.

Threat-Challenge Index for preparation and speech delivery (TCI). As in Experiment 2a, I computed a single threat and challenge index (TCI) for cardiovascular responses during speech preparation and another TCI for responses during the speech delivery. Two separate ANOVAs revealed no significant effects of condition on either of these indexes, $F_{\text{TCI_Preparation}}(1, 52) = .006, p = .941, \eta_p^2 < .001, F_{\text{TCI_Speech}}(1, 52) = .195, p = .661, \eta_p^2 = .004$.

Table 5.8

One-Sample t-tests of absolute patterns during speech delivery

	Malleable		Fixed	
	CO	TPR	CO	TPR
<i>M (SD)</i>	.38 (.62)	-28.09 (389.62)	.41 (.54)	-82.63 (297.07)
95% CI	(.13, .64)	(-185.46, 12.28)	(.21, .63)	(-197.83, 32.55)
<i>t</i>	3.12**	-.36	4.07***	-1.47
<i>d</i>	.61	-.07	.76	-.28

*The reported t-tests tested CV-reactivity against 0(i.e., baseline); * $p < .05$. ** $p < .005$. *** $p < .001$*

5.2.4 Correlations between CV indicators and self-report data. Table 5.9 displays correlations between CO Prep/speech task, TPR Prep/ speech task, TCI Prep/ speech task and self-reported threat before/after, challenge before/after and attributions. No significant correlations were found between self-reported measures and CV indicators.

Table 5.9

Correlations between CV markers and self-reported measures

	1	2	3	4	5	6
1. CO Prep	-					
2. TPR Prep	-.57***	-				
3. CO SPD	.45**	-.22	-			
4. TPR SPD	-.26†57	.59***	-.64***	-		
5. TCI Prep	-.46***	-.46***	-.25†69	-.36*	-	
6. TCI SPD	-.23†99	-.44**	-.42**	-.42**	.72***	-
7. Attributions to ability	.17	-.04	-.03	.06	-.14	-.03
8. Attributions to discrimination	-.02	-.01	-.07	.02	.03	.05
9. Threat before	.12	.07	-.06	.15	-.20	-.010
10. Threat after	-.20	.19	-.19	.13	.09	.07
11. Challenge before	-.01	.08	-.13	.11	-.07	.02
12. Challenge after	-.03	.07	-.14	.14	-.04	-.01

*** $p < .001$, ** $p < .005$, * $p < .05$, † $< .10$

5.2.5 Discussion

Although some researchers have suggested that ability tends to be perceived as stable (i.e., fixed; Sechrist et al., 2004; also see Weiner, 1985), a large body of work initiated by Dweck and Leggett (1986) demonstrates that people vary in the extent to which they perceive that their ability is fixed (entity theory) or malleable (incremental theory). Indeed, this varies both across individuals and, within individuals, across domains. As in study 2a, in study 2b I examined the extent to which attributions to ability are experienced as threatening, depending on how stable/fixed they are perceived to be.

Participants in this study attributed the negative outcome to lack of ability, and more so than to discrimination, as intended. However, contrary to predictions, and to what I found in study 2a with regard to attributions to discrimination, participants in the malleable ability condition reported more threat and less challenge than participants in the fixed ability condition. This is not what I had expected on the basis of previous work on implicit theories of ability, which suggests that a setback attributed to malleable ability opens the door for future improvement and would, therefore, be less threatening than a setback attributed to fixed ability. However, it is important to note that the possibility that malleability opens the door for future improvement is not necessarily unthreatening. If participants believe that they need to improve on something as consequential for their future as a job interview and that they are responsible for this, they might indeed feel threatened. It is, however, not entirely clear why this would be more threatening than feeling that this improvement is not possible. A different possibility for the effects I found is that when ability is described as malleable, participants feel they have more responsibility for not having performed sufficiently well, which is associated with self-blame and feelings related to threat, such as anxiety (Crocker & Major, 1989; Major et al., 2003). Thus, while malleable ability opens the door for future improvements, it can also increase self-blame, which would increase threat. Importantly, this is different to what happens

with regard to attributions to discrimination, since in the case of attributions to discrimination, instability (rare discrimination) does not imply personal responsibility to the same extent as do attributions to unstable (malleable) ability. In fact, as shown in study 1 of this thesis, attributions to ability and to discrimination tend to differ quite crucially in how controllable they are expected to be and this is likely to interfere with the implications of attributional stability. Another reason why the manipulation of stability of ability had the opposite effect to what I expected could be that malleable ability can only be positive when there is time for self-improvement, which might not have been the case in my study. Indeed, participants were only given two minutes to prepare their speech for the task, which they might have found too short to improve on what they had done in the interview itself.

In this study, however, cardiovascular indicators of threat and challenge did not reveal differences across conditions. In sum, participants reported feeling more threatened when they believed their poor ability was malleable, but their physiological responses provide some (weak) indications to the contrary, which would be consistent with our hypotheses, derived from existing knowledge of the effects of implicit theories of intelligence.

5.3 General Discussion

Two studies examined whether the perceived stability of an attribution (to discrimination in study 2a and to lack of ability in study 2b) affects the extent to which individuals experience threat and challenge. Study 2a offered some support to my hypothesis, whereas study 2b revealed mixed results. Despite the low sample sizes, study 2a offers some evidence that attributions to discrimination are more threatening when they are perceived to be pervasive than when they are perceived to be rare. Although this was not significant in all indicators, there was evidence to the contrary in cardiovascular responses. By contrast, study 2b revealed that participants reported more threat when a negative outcome was attributed to

lack of malleable ability than when it was attributed to lack of fixed ability. At a cardiovascular level, none of the indicators suggested any effect of condition on threat, in both conditions there was only an increase in CO compared to the baseline, however, this increase was larger in the fixed ability condition.

Although these results are not entirely conclusive, they raise some interesting possibilities. In particular, they raise the possibility that stability might not mean the same when referring to discrimination and when referring to ability. Drawing on the original conceptualization of Schmitt and Branscombe (2002), I operationalised stability of discrimination (pervasiveness) as referring to whether or not discrimination happened across time and context. This implies, for example, that not everyone devalues one's social group, or that it is not devalued in all contexts or that this devaluation might not last in the future. For ability, I also based myself on the original conceptualisation of Dweck and Leggett (1988) and operationalised the stability of ability as referring to the possibility of improvement across time. This reliance on original conceptualizations is important because it sheds light on how these two hereto separate lines of work relate to each other. Also, since the two studies are separate, and do not directly compare the two types of attributions, this 'messy' conceptualization does not invalidate these studies. However, it does create problems when we try to compare the effects of stability for the two types of attributions, which is an important ultimate goal of this work. It is, therefore, important to reflect further on how stability is perceived for the two types of attributions and how these might be made more parallel.

In sum, these two conceptualizations of stability differ in multiple ways—not only in locus, as intended, but also in whether they refer to time and context, or only to time, and whether they refer to change, or more narrowly to improvement. Though I consider that this chapter provides interesting evidence that speaks to these original conceptualizations of change,

in order to be able to compare stability of these attributions more directly, we need to make these more parallel to each, which will be addressed in the next chapter.

The results of the manipulation checks in study 2b provide some interesting cues in this regard. These suggest that I succeeded in manipulating perceptions of stability of ability across conditions. However, although participants in the fixed condition rated ability as more stable than participants in the malleable condition, ratings in both conditions were significantly below the mid-point of the scale. This suggests that all participants believed that ability is changeable, but to different degrees. Indeed, participants in the fixed ability condition were, in reality, in a malleable ability condition, whereas participants in the malleable condition were in an *extremely* changeable condition. This raises the possibility that participants in the fixed condition in fact believed that ability was changeable, which can be challenging, whereas participants in the malleable condition believed that ability was entirely under their control, which might be more threatening than challenging. That is, it might be important for individuals to perceive that their ability is malleable, but not to perceive that they have sole responsibility for that improvement. If so, then physiological responses would suggest the opposite because they tap into different, non-conscious, processes (Blascovich et al., 2011).

Although these two experiments provided very interesting and insightful results, there were a few additional limitations which need to be addressed. One important limitation is the small sample sizes in these studies. A large number of participants had to be excluded from the data set, largely due to equipment failure (lost data or recording noisy data). This creates serious problems with the reliability of the findings (see Guo, Pohl, & Gerokostopoulos, 2013) and it is, therefore, important to replicate these studies with larger sample sizes. In addition, there were some methodological issues in these studies that it would be important to address, such as the failure to show effects on the manipulation checks in study 2a. Finally, these studies constituted my first attempt to examine the effects of stability across these two attributions, but

the methods used in this chapter do not allow me to directly compare how stability works for the two attributions. In the next chapter, I report a large study (Experiment 3) that addresses these limitations and provides an opportunity to compare the effects of stability of attributions to discrimination and to ability in a more direct and profound way.

6 Threat vs. Challenge as a Result of Attributions for Negative Outcomes: The Role of Attributional Stability

Belonging to a social group that is socially stigmatized significantly increases the chance that members of those groups might encounter discrimination (Schmitt & Branscombe, 2002). Accordingly, discrimination is always a plausible attribution for members of stigmatised groups when they receive a negative outcome, a situation which has been referred to as ‘attributional ambiguity’ (Major & Crocker, 1989). While this idea is now well-accepted, there is less agreement in the literature about the effects of this ambiguity. Authors argue that this ambiguity provides group members with a chance to make attributions that are self-serving or self-protective (Crocker, Voelkl, Testa, & Major, 1991; Testa, Crocker, & Major, 1988; Twenge & Crocker, 2002). However, what exactly is regarded as self-protective has been hotly debated (Branscombe & Schmitt, Harvey, 1999; Schmitt & Branscombe, 2002; Schmitt, Branscombe, & Postmes, 2003).

Specifically, some authors have argued that making attributions of negative outcomes to discrimination can in fact be self-protective because it allows individuals to deflect responsibility for the negative outcome and to maintain their sense of competence (see Crocker & Major, 1989; Major, Kaiser, & McCoy, 2003; Sechrist, Swim, & Stangor, 2004). In addition, researchers have argued that, compared to attributions to lack of ability, attributions to discrimination secure a sense of control over future outcomes, (Sechrist et al., 2004). The assumption here is that attributions to discrimination are both more external and less stable than attributions to lack of ability, so negative outcomes attributed to discrimination are less likely to re-occur than negative outcomes attributed to lack of ability. Taken together, these arguments would suggest that attributions to discrimination are less threatening than attributions to lack of ability because they are perceived as more external and less stable.

In contrast to this view, Schmitt and Branscombe (2002) argued that attributions to discrimination can be regarded as internal, since they refer to an important part of one's identity—one's social identity (see also Jetten, Branscombe, Schmitt, & Spears, 2001). That is, when individuals attribute a negative outcome to discrimination they recognise that there is an aspect of themselves that is devalued by others and is at the root of the negative treatment. In addition, Schmitt and Branscombe (2002) suggest that one cannot claim that attributions to discrimination are necessarily less stable than attributions to lack of ability—indeed, for members of severely stigmatized social groups, discrimination can be regarded as very stable. These authors additionally argue that the perceived stability of attributions to discrimination can vary across groups and individuals. Discrimination against some groups (e.g., women) is perceived as more pervasive than discrimination against other groups (e.g., men). Also, even within the same social group, group members can vary in the extent to which they perceive discrimination as pervasive—or as stable cause of negative outcomes. Importantly, these authors demonstrated that attributions to discrimination have more negative effects when discrimination is perceived as pervasive than when it is perceived as rare (Schmitt et al., 2003). This line of reasoning suggests that attributions to discrimination are not necessarily less threatening than attributions to lack of ability. Instead, the extent to which attributions to discrimination are threatening is likely to depend on how stable (or pervasive) they are perceived to be. One goal of the research reported in this chapter is to examine this possibility.

An additional aim of this research was to directly compare the effects of attributions to discrimination to the effects of attributions to lack of ability, as a function of the perceived stability of each attribution. As for discrimination, ability can be seen as stable (or fixed) or unstable (malleable; Dweck & Legget, 1988). A large body of research led by Carol Dweck has suggested that when individuals believe that their ability is fixed setbacks are experienced as threatening, leading to avoidance coping strategies (e.g., disengagement; De Castella &

Byrne, 2015; Dweck & Master, 2009). By contrast, individuals who believe that their ability is malleable regard setbacks as indicators that they need to change their strategy to improve their skills (Dweck, 1986; Dweck & Elliott 1983; Dweck & Master, 2009; Elliott & Dweck, 1988). The results of study 2b, however, raise a different possibility. Specifically, it is possible that when it comes to attributions to lack of ability, perceived instability (malleability) can sometimes be aversive, for example because it might place a level of responsibility for self-improvement on the individual that is experienced as stressful (i.e., threatening) rather than as challenging. This finding, however, might be specific to particular methodological choices made in the previous chapter and needs to be replicated before these ideas are revisited.

Taken together, past research suggests that it is too simplistic to expect one attribution to be less threatening than the other, since how people experience attributions to discrimination and to lack of ability is likely to depend on the extent to which these are perceived to be stable. Past research has however not directly examined experiences of threat as a function of the stability of attribution, comparing attributions to discrimination to attributions to lack of ability. This is the core goal of the research reported in this chapter.

Threat and Challenge

Threat is not the only possible response to negative outcomes. People can also react by being challenged, instead of threatened, particularly if they are given the chance to improve their performance (Scheepers, 2009; Drach-Zahavy & Erez, 2002; Tomaka, Blascovich, Kelsey, Leitten, 1993). With regard to discrimination, while people often react to this experience by feeling threatened, it is possible to conceive that situations like perceiving discrimination as rare might instead be associated with challenge if people are given the chance to disprove the stereotypes on which discrimination is based. When it comes to attributions to lack of ability, one might expect that individuals might feel challenged to improve their

performance if they receive a negative outcome but perceive ability as malleable (Dweck & Leggett, 1988; Doron, Stephan, Boiché, & Le Scanff, 2009; Ommundsen, 2003).

In line with this reasoning, the research reported in this chapter aimed at providing direct evidence for the extent to which attributions to discrimination or to lack of ability are experienced as a threat or a challenge, depending on whether these are perceived as stable or unstable. To do so, I assessed threat and challenge in two ways: Through self-reported emotions previously related to threat and challenge and through cardiovascular markers of motivational state of threat and challenge.

In line with the biopsychosocial model (BPS) of threat and challenge proposed by Blascovich and colleagues (Blascovich & Mendes, 2000; Blascovich & Tomaka, 1996), physiological measures provide a relatively direct, continuous, and unobtrusive way to access threat and challenge experiences. According to this model, threat and challenge states, measured in a motivated performance situation (e.g., job interview), are the results of appraisal of situational demands and personal resources. When individuals appraise that their personal resources exceed situational demands, they experience challenge. In contrast, when they estimate that situational demands exceed their personal resources, they experience threat (Blascovich, 2008; Tomaka et al., 1993). At the physiological level, threat and challenge can be indexed through cardio vascular (CV) responses. Threat is marked when the amount of blood pumped by the heart per minute (cardiac output or CO) decreases and peripheral vascular resistance (total peripheral resistance, or TPR) increases, relative to baseline. By contrast, challenge is marked when CO increases and TPR decreases (Blascovich & Mendes, 2000; Blascovich & Tomaka, 1996; Scheepers, 2009), relative to baseline.

6.1 Overview of the Current Research

This chapter reports one study that aimed to investigate experiences of threat and challenge as a result of a negative outcome that was attributed either to discrimination or to lack of ability, as a function of the perceived stability of this attribution.

As in studies 2a and 2b, threat and challenge were measured with self-reports and physiological measures. However, this study adds to the research reported in the preceding chapter by enabling a direct comparison between responses to the two types of attributions. In addition, studies 2a and 2b did not include conditions without the provision of information about the stability of attributions, impairing comparisons between manipulated perceptions and the default perceptions of stability when attributions to discrimination or to lack of ability are made. To enable these comparisons, study 3 included two control conditions: One in which no information about the stability of attributions to discrimination is provided and another in which no information about the stability of attributions to ability is given.

To enable comparisons between the two types of attribution, however, it was necessary to introduce a change in how stability was manipulated. Specifically, while in studies 2a and 2b, stability of discrimination referred most obviously to the extent to which it could be expected within the selection panel, stability of ability referred most directly to the extent to which ability can be improved across time. To address this, in study 3, I developed a manipulation in which the meaning of stability was more parallel across both types of attributions. Specifically, in this new study I attempted to make stability of discrimination and ability more parallel to each other by focusing on the possibility of change *across time*. That is, in this study, stability of both attributions refers to the possibility that these attributions are (or not, depending on condition) likely to hold again at a future point in time.

A few additional methodological improvements were made to this study, to address problems identified with studies 2a and 2b. The manipulations in studies 2a and 2b were delivered orally by me, who is a female non-native English speaker, which might have reduced the clarity of the message, its credibility, or even participants' ability to pay attention to it. To address these potential problems, in this study the manipulation was delivered in the format of a written journal article. Also, in studies 2a and 2b I did not observe convincing evidence for the success of the manipulations, but this might have been due to the fact that participants answered the manipulation checks only at the end of the study. To address this problem, in this study, participants answered the manipulation checks right after reading the article used to manipulate the independent variables. In addition, in studies 2a and 2b self-reported threat was measured once after speech delivery task, but before the recovery period, and again after the 5-minute recovery period. This was done because I was interested in seeing whether or not the manipulation would have effects on people's self-reported threat experiences that would make recovery harder, eliciting differences across conditions both before and after recovery, or only before recovery. In study 3, however, I chose to assess self-reported threat before and after the speech task to examine whether this would allow for a closer match with physiological threat measures (i.e., to examine whether self-reported threat prior to the speech task would more closely match physiological indicators or threat than when this is only measures after the speech task).

Generally, I expected that participants would experience more threat (and potentially less challenge) when attributions to discrimination are portrayed as unstable than when they are portrayed as stable. Given the results of the previous chapter, I had more explorative hypotheses regarding the role stability might play for attributions to ability, but given lack of strong evidence to the contrary and the methodological changes I introduced to this study, I

maintained the hypothesis that they would function in a parallel way, expecting no interactions between stability and locus. Specific hypotheses for the core measures are:

- a. I expected that participants would report more threat emotions when discrimination was portrayed as stable (pervasive) than when it was portrayed as unstable (rare) (hypothesis 1a). I tentatively made the same prediction for ability, expecting more threat emotions when ability was portrayed as stable (fixed) than when it was portrayed as unstable (malleable) (hypothesis 1b).
- b. I expected a similar pattern with regard to physiological responses, with decreased CO and increased TPR, relative to baseline, expected when discrimination (hypothesis 2a) or ability (hypothesis 2b) was portrayed as stable relative to unstable. These effects are expected during preparation time and / or the speech task.
- c. As in the prior chapter, predictions for challenge are more tentative, but my expectations was that participants would report more challenge when attributions were portrayed as unstable than when they were portrayed as stable, for discrimination (hypothesis 3a) and for ability (hypothesis 3b).
- d. Finally, I expected a similar pattern for physiological indicators of challenge, with stronger increases in CO and decreases in TPR, relative to baseline, in the unstable than the stable conditions for both discrimination (hypothesis 4a) and ability (hypothesis 4b).

6.2 Method

Design and Participants. This experiment had a 2 (Locus of attribution: Gender discrimination vs. Lack of ability) x 3 (Stability of attribution: Stable vs. Unstable vs. Control) between participants design. Participants were randomly allocated to one of the six conditions. In total, 257 female participants took part in this experiment. Power analyses to determine required sample size were not conducted prior to the experiment.

Procedure. As in studies 2a and 2b, participants were invited to the lab to take part in a study looking at the psychological and physiological experiences of an online job interview. Upon arrival, participants were welcomed by a female experimenter (myself). Participants read that this study involved a main study and a pilot study which was going to take place during a pause in the main study. Participants read that the pilot study aimed to test materials for a future study and that they would be asked to read a text and answer some questions about it, to help us create a version of the text that was sufficiently clear. In reality, this ‘pilot’ study consisted of the manipulation of attributional stability. Participants also read that the main study would involve an online job interview to allow us to study psychological and physiological experiences during job interviews. This would require attaching participants to electrodes during the study. It was made clear that although the interview was not meant to select candidates for a real job, it was meant to mirror interviews for real jobs, so participants should do their best to take the experience seriously. After participants read and signed the informed consent, they sat in front of a desk equipped with a computer and a video camera and were attached to six electrodes for physiological measurement (two on the chest, two on the neck, and two on the lower back). To collect blood pressure data, participants wore a finger cuff on their index and middle finger, plus an arm cuff that served to calibrate the blood pressure measurement. Participants were asked to try to move the least possible, so as not to interfere with physiological measurements.

At this point the experimenter told participants that there were some technical issues and therefore it was not possible to see or hear the interviewer. The experimenter explained that

Unfortunately, we have some technical problems. What normally happens is that the interviewer and participants can directly see and talk to each other through the camera provided. However, because of some technical problems at the company

where the interviewer is, they had to turn their camera off until they solve this problem, so we are not able to see or hear the interviewer, but they are still able to see and hear us. The company suggested that what they normally would do in these sorts of situations is that the interviewer available will email us the interview questions, I will print them out and bring them to you. You can read the questions out loud and answer them orally and looking at the camera, so that interviewer can hear your answers and fill the evaluation form.

At this point I told participants that I had to check which one of the interviewers was available to interview them and I left the room. When I entered the room again, I announced that the available interviewer was Mr. Wilson and that I was expecting him to email the interview questions. I then left the room and participants started reading the remaining information and instructions, which were displayed on the computer screen. Participants read that they were going to take part in an online job interview, which focused on the position of “project manager.” The interview would be with one of 20 human resource (HR) managers from companies around Exeter, all of whom volunteered to help with the study. Participants were told that these 20 HR managers were experienced with recruitment and hiring processes and represented the various domains in which graduates apply for jobs (e.g., business, retail, real estate, service jobs). These specific HR managers were selected because they formed a representative sample of the type of person that carries out job interviews in these various contexts. This information was provided to ensure that participants linked the procedures followed in this experimental context to how they might be treated in real life when applying for jobs.

Once participants had received these initial instructions, but before the interview took place, there was a 5-minute rest period to collect baseline physiological measures (Scheepers, Saguy, Dovidio, & Gaertner, 2014). During this baseline period, participants watched a video

showing footage of animals and plants under the sea (Piferi, Jarred Younger, & Lawler, 2000) to ensure they were focused and relaxed. After five minutes, the computer showed some basic information about the interviewer, including his name and a photograph. This was the photograph I used in the experiment 2a and 2b, which was piloted to ensure it credibly portrayed a human resource manager. At this point I gave participants their interview questions and turned the camera on. The interview questions were the same for all participants and consisted of general questions about work experience and aspiration:

- What do you look for in a job?
- What is the most important skill a project manager should have?
- What has been the most significant project you have worked on?
- What skills do you have that will make you a good employee?
- Can you give an example of good team work you have been a part of?

Manipulation. After the interview finished, I told participants that it would take a few minutes until the interviewer completed their evaluation form. Participants in the experimental conditions were told that, in the meantime, there would be a pause in the main study, during which we would appreciate if they could help us with the pilot study. To reinforce this cover story, participants read and signed a new informed consent for the pilot study and subsequently read one of four articles and answered the manipulation checks, embedded in some filler questions.

The articles participants read varied according to condition. In the pervasive gender discrimination condition, the text highlighted that women face widespread discrimination in many important areas of their lives and this has remained unchanged in the last 10 years. In the rare discrimination condition, however, it was mentioned that discrimination against women is now rare and has significantly decreased in the last 10 years. In the fixed ability condition,

participants read that basic abilities do not change much over the life span and that a study observing participants' basic cognitive ability and social skills over a period of 10 years, reported that participants' ability remained almost the same in that period. In the malleable ability condition, conversely, it was highlighted that people's basic abilities are changeable and can be improved and that a study observing participants over a period of 10 years, reported that participants' ability had improved in this period (see appendix C for the full wording of the manipulation in all conditions). Therefore, in all conditions attributional stability referred to improvement across time. Participants in the control conditions did not receive any article to read, they simply waited a few minutes before receiving the evaluation form.

After reading and evaluating the manipulation texts, participants in all conditions received the same interviewer evaluation form in which they received a poor evaluation from the interviewer, who recommended rejecting them (see appendix C). At the bottom of the form, the interviewer had a chance to provide additional qualitative comments. These comments were pre-prepared to manipulate locus of attribution. We included some spelling errors in these comments to enhance credibility, since the interviewer would have had to type them quickly. In the ability conditions, participants read that:

I'm sorry to say I wouldn't be able to recommend you for a project management position in a large multi-national company. It seems that you lack some essential skills and qualities necessary to succeed in a large company environment. Your answers were quite unconvincing, you failed to demonstrate self-confidence and leadership potential, and, generally, haven't come across as a suitable candidate. I'm sorry if this sounds harsh, but this opinion is based on experience...

However, in the gender discrimination conditions participants read:

I'm sorry to say I wouldn't be able to recommend you for a project management position in a large multi-national company. I find that most female graduates do not seem to be suitable for such positions of responsibility, and you've come across as a typical representative of this type of applicants. Jobs in multi-national corporations require dedication and certain priority-setting that most applicants from your demographic group just cannot match. I'm sorry if this sounds harsh, but this opinion is based on experience...

We deliberately kept the length and content of these two texts as close as possible. After this, participants answered the manipulation checks for the attributional locus manipulation.

Motivated performance task. To assess physiological threat and challenge it is necessary to introduce a motivated performance task (by others or by themselves; Blascovich & Mendes, 2000). As such, after receiving the negative feedback participants were asked to deliver a speech about their work abilities. They were given some tips about what to cover (e.g., similar to the questions to the interview) and 2 minutes preparation time. Participants were told that this speech would be evaluated by another interviewer to implicitly simulate the implications of pervasive vs. rare gender discrimination in real life. That is, for participants in the rare gender discrimination condition there would be a chance that the next interviewer would not be sexist, whereas for those in the pervasive gender discrimination condition, evaluation by another interviewer would mean that the new evaluator would be likely to be as sexist as the interviewer who had rejected them. For participants in the malleable ability condition, the two-minute preparation time would allow them to think about how to improve their performance in the speech, relative to what they had done during the interview, something that would be less likely to happen with participants in the fixed ability condition.

After this task, participants answered the remaining questions and were then told the experiment was over, were debriefed, thanked, and compensated for their participation (in line

with departmental regulation, first year psychology students chose between 1 course credit or £5, whereas the remaining participants received £5).

Measures. After participants received the evaluation form indicating they had been rejected, they answered questions about what their outcome had been, what the interviewer thought about their performance (both to check understanding of the feedback received), and what they thought was the cause of their outcome (attribution checks). Then they indicated their appraisals of the speech task and their emotions. Emotions were indicated twice: Once right before the speech delivery task, and a second time after the speech delivery task. Unless otherwise specified, all questions were answered by expressing agreement with statements on 7-point Likert-type scales (from 1 = “Not at all” to 7 = “Very much”). Physiological indicators were assessed continuously throughout the experiment.

Checks. To check participants had understood the feedback correctly, participants answered a question about the interviewer’s evaluation of their performance (from 1= “Very negative” to 7= “Very positive”). Also, participants indicated whether the interviewer had recommended acceptance or rejection. In line with the procedure, all participants should indicate a poor performance evaluation and rejection by the interviewer.

To check if manipulation of stability of ability was successful, right after reading the article manipulating these perceptions, participants in the ability conditions answered two questions adapted from Dweck, Chiu, and Hong (1995): “All in all, to what extent do you think that one’s basic cognitive abilities (such as reasoning style and ability to empathize) can be changed across one’s life?” and “To what extent do you think that one can’t really improve one’s performance on tasks that involve these basic cognitive abilities?” Participants indicated their responses on 7-point Likert-type scales (from 1 = “Cannot change at all” to 7 = “Can change very much”). These two items formed a reliable scale ($r = .34$ $p = .002$) and were

averaged for further analyses. Higher scores on this measure indicate a strong belief in the malleability of ability.

To check if the manipulation of pervasiveness of discrimination was successful, after reading the gender discrimination article, participants answered the following two questions: “To what extent do you think that women have equal chances to men?” and “How rare/pervasive do you think that discrimination against women is currently in British society?” After recoding the second item, these two items formed a reliable scale ($r = .36$ $p = .001$) and were averaged for further analyses. Higher scores on this measure indicate a strong belief that gender discrimination is now rare.

Attributions for the rejection. To establish that participants in the ability conditions made more attributions to ability than to discrimination, whereas participants in the discrimination condition did the opposite, participants answered four attribution questions: Two items assessed attributions to lack of ability: “The recommendation I received from the interviewer was mainly due to my performance during the interview (what I said and how I behaved)” and “The recommendation I received from the interviewer was mainly due to my interview skills.” These items formed a reliable scale ($r = .82$) and were averaged for analyses. Two additional items measured attributions to gender bias: “The recommendation I received from the interviewer was mainly due to prejudice on the part of the interviewer” and “The recommendation I received from the interviewer was mainly due to a biased opinion on the part of the interviewer.” These two items also formed a reliable scale ($r = .93$) and were averaged for further analyses.

Speech delivery appraisals. Appraisals were measured twice: Before and after the speech delivery task. This time, after the preparation time and before delivering the speech, participants indicated to what extent they felt stressed about the speech task, the extent to which they thought that they would be able to handle this task successfully, and the extent to which

participants thought their speech would be positively evaluated by the new HR manager (adapted from Mendes, Blascovich, Lickel, & Hunter, 2002). These three items were highly correlated and formed a reliable scale, so they were averaged for further analysis ($\alpha = .80$). After the speech delivery task, participants indicated the extent to which they thought their performance met their expectations of how they would be able to perform.

Emotions. Participants rated the extent to which they experienced 11 emotions related to threat and challenge (inspired by Folkman & Lazarus, 1985) twice during the experiment: First before delivering, but after preparing, the speech (right after the speech appraisals), and again right after speech delivery task. Threat-related emotions assessed the extent to which participants felt anxious, worried, calm, relaxed, and threatened. After recoding positive emotions, these items formed a reliable scale and were averaged for further analysis ($\alpha_{\text{before}} = .88$, $\alpha_{\text{after}} = .88$). Challenge-related emotions measured the extent to which participants felt eager, confident, energised, invigorated, discouraged, and unmotivated. After recoding negative emotions, these items formed a reliable scale ($\alpha_{\text{before}} = .81$, $\alpha_{\text{after}} = .85$) and were averaged for analyses. We also asked participants the extent to which they felt ‘Helpless,’ which is an emotion that is central in research on implicit theories of ability. This emotion was analysed separately from the threat and challenge scales.

Gender identification. To shed further light on how participants might be coping with the rejection, we added a measure of gender identification. At the end of the study four items measured the extent to which participants identified with their gender group. On a 7-point scale from 1= “Not at all” to 7= “Very much”, participants indicated the extent to which they identify with their gender group, for example, “Being a woman is an important part of my identity” or “I feel solidarity with other women”. These items formed a reliable scale ($\alpha = .85$) and were averaged for further analyses.

Cardiovascular responses (CV). We collected cardiovascular responses continuously during the experiment by measuring Impedance Cardiography (ICG), Electrocardiography (ECG), and continuous blood pressure (BP) with the Biopac MP150 system (Biopac Systems Inc., Goleta, CA). These responses were stored and scored using *AcqKnowledge* software (Biopac Systems). These CV responses allowed us to calculate Heart Rate (HR; Number of heart beats per minute), Pre-Ejection Period (PEP; the time interval from the beginning of electrical stimulation of the ventricles to the opening of the aortic valve), Cardiac Output (CO; amount of blood pumped by the left ventricle each minute), and Total Peripheral Resistance (TPR; the overall resistance to blood flow through the systemic blood vessels), which were necessary for analyses of task engagement and threat and challenge (Scheepers et al., 2015).

Data from eight participants was excluded due to various procedural errors: One did not receive 5-minute baseline, one received an irrelevant evaluation form, one participant took part in the study twice (data from the first time this participant took part were retained), one participant received both the newspaper article meant to induce the perception of gender discrimination as rare and the article meant to induce the perception gender discrimination as pervasive, one participant had already taken part in a similar study, one participant entered the interviewer's recommendation as accepted (in all conditions participants were rejected), and two participants quit during the study. To maximize data conservation, analyses of the self-report data were conducted on all participants who had valid self-report data, i.e. 249 participants – 44 in the stable ability condition, 43 in the unstable ability condition, 39 in the ability control condition, 43 in the stable discrimination condition, 40 in the unstable discrimination, and 40 in the discrimination control condition. Of these eight excluded participants, one was in the stable ability condition (2.27% of participants in this condition), one was in the unstable ability condition (2.33% of participants in this condition), two were in the control ability condition (4.88% of participants in this condition), one was in the stable

discrimination condition (2.27% of participants in this condition), three were in the unstable discrimination condition (6.98% of participants in this condition), and no participant was excluded in the control discrimination condition.

Analyses for CV responses were conducted on the 222 participants with valid data – 39 in the stable ability condition, 37 in the unstable ability condition, 37 in the ability control condition, 35 in the stable discrimination condition, 39 in unstable discrimination, and 35 in discrimination control condition. In addition to the eight participants excluded from self-report data, 27 more participants were excluded from these analyses due to technical difficulties. The reasons were one of the following: One participant claimed to have a heart condition after participating in the study (following established protocols for the collection of cardio-vascular data, participants with heart conditions were not eligible for the study), poor or unscorable ICG (e.g., lost ICG data, ICG wave with unclear b and x points, or loose electrodes), unstable data (due to high levels of physical movement), no baseline recorded, loose electrodes, and extremely low baseline HR (35). Out of these 27 excluded participants, five were in the stable ability condition (11.36% of participants in this condition), six were in the unstable ability condition (13.95% of participants in this condition), two were in the control ability condition (5.13% of participants in this condition), eight were in the stable discrimination condition (18.61% of participants in this condition), one was in the unstable discrimination condition (2.50% of participants in this condition), and five participants were excluded in the control discrimination condition (12.50% of participants in this condition).

For some of our participants, Blood Pressure (BP) data was not used due to unstable BP signal. However, for these participants it was still possible to calculate PEP, HR and CO. Given that each case presented slightly different problems, different strategies were utilised. For example, in some cases, the scoring was done on the first or last 40 seconds rather than a minute.

In other cases, the errors of HR or BP were wiped out. To see the full diary of CV responses scoring please see appendix C.

6.3 Results

6.3.1 Self-Reported Dependent Variables.

Manipulation checks. Participants in the discrimination condition only answered the discrimination checks and participants in the ability condition only answered the ability checks. For this reason, two separate ANOVA tests were conducted to test effects of stability of discrimination and ability on manipulation checks.

An analysis of variance (ANOVA) with pervasiveness of discrimination (Pervasive vs. Rare) indicated a significant effect of this factor on the manipulation checks of pervasiveness of discrimination, $F(1, 86) = 13.47, p < .001, \eta^2_p = .14$: As intended, participants in the rare discrimination condition ($M=4.19, SD= 1.23$) believed that gender discrimination is more rare than participants in the pervasive discrimination condition ($M=3.23, SD= 1.17$). This suggests that the manipulation of pervasiveness of discrimination was successful.

An analysis of variance (ANOVA) with stability of ability (Fixed vs. Malleable) as the independent variable showed a significant effect of this factor on the manipulation check of stability of ability, $F(1, 86) = 22.28, p < .001, \eta^2_p = .21$: As intended, participants in the malleable ability condition reported that ability is more flexible ($M=5.27, SD= 1.04$) than participants in the fixed ability condition ($M=4.11, SD= 1.22$). This suggests that the manipulation of stability of ability was successful.

Attributions. I conducted a 3 (Stability of attribution: Stable vs. Unstable vs. Control) x 2 (Locus of attribution: Gender discrimination vs. Lack of ability) x 2 (Measured attributions: Lack of ability vs. Gender bias) MANOVA with repeated measures on the last factor. This analysis showed a significant main effect of locus of attribution, $F(1, 243) = 33.34, p < .001$,

$\eta_p^2 = .121$, which was qualified by a significant interaction between the manipulated locus of attribution and the measured attribution, $F(1, 243) = 443.10, p < .001, \eta_p^2 = .646$ (see Figure 5.1). Simple effects showed that participants made more attributions to lack of ability ($M = 5.49, SD = 1.34$) than to gender bias ($M = 2.24, SD = 1.36$) when primed to do so (i.e., ability conditions), $t(248) = 15.57, p < .001, 95\% \text{ CI } [2.84, 3.67], d = 2.41$, whereas when primed to attribute the rejection to gender discrimination participants made more attributions to gender bias ($M = 5.95, SD = 1.37$) than to lack of ability ($M = 2.96, SD = 1.62$), $t(248) = 14.16, p < .001, 95\% \text{ CI } [2.57, 3.4], d = 1.99$. This is in line with what I intended with the manipulations. Also, participants made significantly more attributions to lack of ability in the ability conditions than in the discrimination conditions, $t(248) = 13.45, p < .001, 95\% \text{ CI } [2.16, 2.9], d = 1.7$, whereas they made more attributions to gender bias in the discrimination condition than in the ability condition, $t(248) = 21.46, p < .001, 95\% \text{ CI } [3.37, 4.05], d = 2.72$ (see Figure 6.1).

This analysis revealed no other significant main or interaction effects: Main effect of stability, $F(2, 243) = .16, p = .853, \eta_p^2 = .001$, main effect of measured attribution, $F(1, 243) = 0.76, p = .383, \eta_p^2 = .003$, three-way interaction $F(2, 243) = 0.91, p = .404, \eta_p^2 = .007$, and no interaction between locus and stability, $F(2, 243) = 1.00, p = .369, \eta_p^2 = .008$.

In sum, participants' attributions were guided by the locus that was primed and were unaffected by the manipulated stability of attributions.

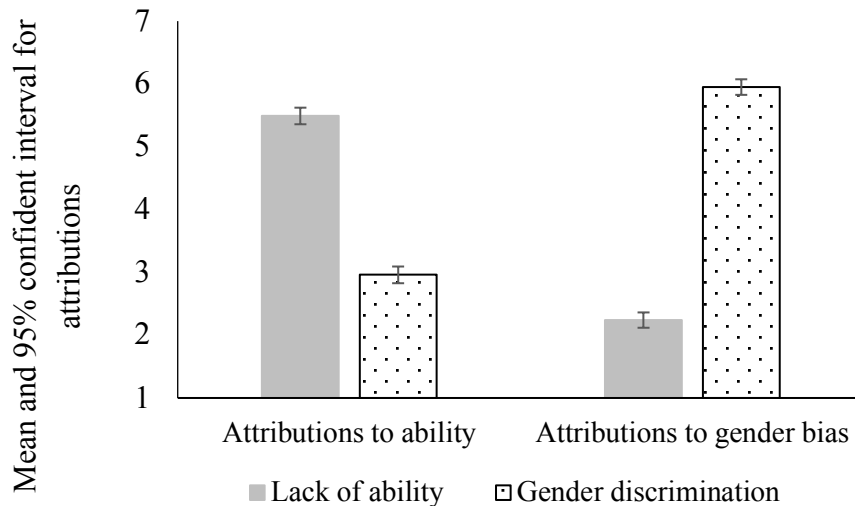


Figure 6.1. Attributions to lack of ability and to gender bias in the ability and gender discrimination conditions.

Emotions

Threat and challenge before the speech delivery task (SPD). To compare threat and challenge-related emotions across all conditions (Hypotheses 1a, 1b, 3a and 3b), I ran a 3 (Stable vs. Unstable vs. Control) x 2 (Gender discrimination vs. Lack of ability) x 2 (Emotions: Challenge vs. Threat) multivariate ANOVA with repeated measures on the last factor. The result indicated a significant main effect of type of emotions, $F(1, 243) = 17.87, p < .001, \eta^2 = .068$, that was qualified by a significant interaction between type of emotion and locus of attribution, $F(1, 243) = 12.97, p < .001, \eta^2 = .051$ (see Figure 6.2). Follow-up tests indicated that participants reported more threat ($M = 4.27, SD = 1.26$) than challenge ($M = 3.27, SD = 1.03$), $t(248) = 5.64, p < .001, 95\% \text{ CI } [.65, 1.35], d = .87$, when the rejection was due to lack of ability, but equal levels of threat ($M = 3.82, SD = 1.33$) and challenge ($M = 3.74, SD = 1.06$) when the rejection was due to gender discrimination, $t(248) = .46, p = .643, 95\% \text{ CI } [-.27, .44], d = .07$. Also, participants reported more threat when rejected due to lack of ability ($M = 4.27, SD = 1.26$) than when rejected due to gender discrimination ($M = 3.82, SD = 1.33$), $t(248) = 2.07, p = .007, 95\% \text{ CI } [.12, .77], d = .35$, whereas they reported more challenge when rejected

due to gender discrimination ($M = 3.74$, $SD = 1.06$) than when rejected due to lack of ability ($M = 3.27$, $SD = 1.03$), $t(248) = 3.56$, $p < .001$, 95% CI [.21, .74], $d = .45$.

No other effects were significant: Main effect of stability, $F(1, 243) = 0.86$, $p = .426$, $\eta_p^2 = .007$, main effect of locus, $F(1, 243) = .05$, $p = .818$, $\eta_p^2 < .001$, interaction between stability and locus, $F(1, 243) = .27$, $p = .766$, $\eta_p^2 = .002$, interaction between stability and type of emotion, $F(1, 243) = 1.00$, $p = .370$, $\eta_p^2 = .008$, and three-way interaction $F(1, 243) = .43$, $p = .650$, $\eta_p^2 = .004$. Therefore, contrary to the hypotheses 1(a and b) and 3(a and b), attributional stability did not affect self-reported threat and challenge in this study.

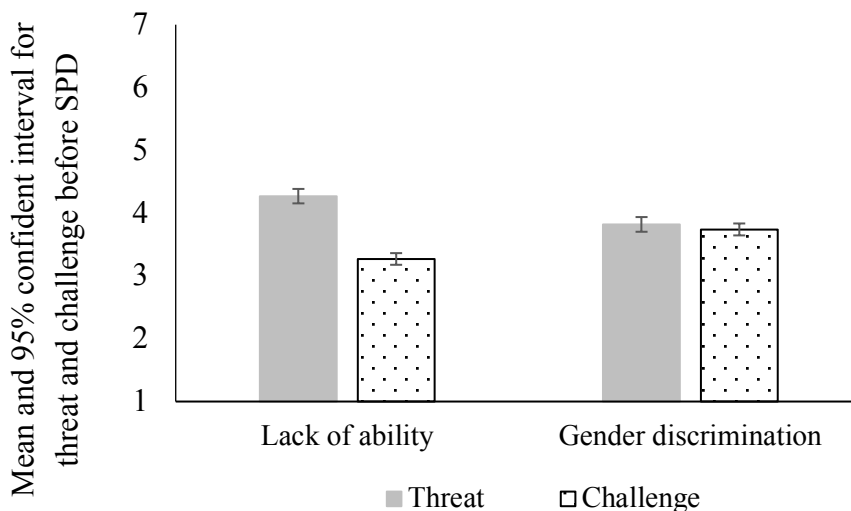


Figure 6.2. Threat and challenge emotions before speech task, as a function of whether rejection was due to lack of ability or to gender discrimination.

Threat and challenge after the speech delivery task (SPD). To compare threat and challenge related emotions across all conditions after speech delivery task, I ran a $3 \times 2 \times 2$ multivariate ANOVA with repeated measures on emotions (threat vs. challenge) after the speech task. The results indicated a significant main effect of type of emotion that was unqualified by any higher order interaction. Irrespective of condition, participants reported

significantly more challenge ($M = 3.77$, $SD = 1.24$) than threat ($M = 3.27$, $SD = 1.33$), $F(1, 243) = 11.69$, $p = .001$, $\eta_p^2 = .046$, after the speech.

This analysis revealed no other significant effects: Main effect of locus, $F(1, 243) = 1.10$, $p = .296$, $\eta_p^2 = .004$, main effect of stability, $F(1, 243) = 2.09$, $p = .126$, $\eta_p^2 = .017$, interaction between locus and stability, $F(1, 243) = .01$, $p = .988$, $\eta_p^2 < .001$, interaction between emotion and locus, $F(1, 243) = 1.66$, $p = .200$, $\eta_p^2 = .007$, emotion and stability, $F(1, 243) = .53$, $p = .590$, $\eta_p^2 = .004$, and three-way interaction between emotions, locus, and stability, $F(1, 243) = .18$, $p = .839$, $\eta_p^2 = .001$.

Threat before vs after speech delivery task. To compare threat before and after speech task, we ran a $3 \times 2 \times 2$ MANOVA with repeated measures of threat before vs. after speech task (time). This analysis revealed no significant main effect of locus, $F(1, 243) = 3.41$, $p = .066$, $\eta_p^2 = .014$. The main effect of time was significant, $F(1, 243) = 109.8$, $p < .001$, $\eta_p^2 = .311$, indicating that participants reported significantly more threat before ($M = 4.05$, $SD = 1.31$) than after ($M = 3.27$, $SD = 1.34$) the speech task. In addition, the interaction between time and manipulated locus of attribution was significant too, $F(1, 243) = 4.62$, $p = .033$, $\eta_p^2 = .019$, indicating that the interaction emerges because the effect of reported threat in the ability conditions ability (compared with in discrimination conditions) are stronger before (ability: $M = 4.27$, $SD = 1.25$ vs. discrimination: $M = 3.82$, $SD = 1.33$; $t(248) = 2.65$, $p = .009$, 95% CI [.11, .76], $d = .74$) than in after the speech task (before: $M = 3.32$, $SD = 1.33$; after $M = 3.21$, $SD = 1.34$, $t(248) = .07$, $p = .485$, 95% CI [-.22, .46], $d = .46$) (see Figure 6.3).

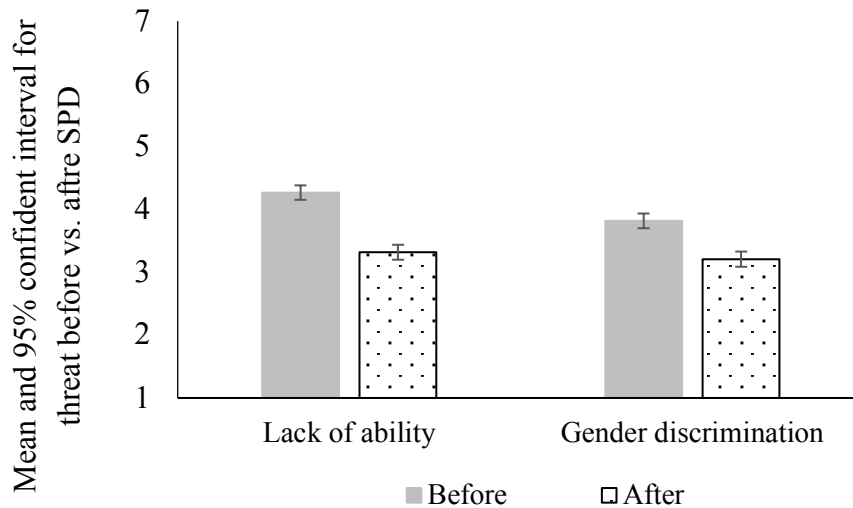


Figure 6.3. Threat before vs. after the speech task across manipulated locus.

This analysis revealed no other significant effects: Main effect of stability, $F(2, 243) = .32, p = .732, \eta_p^2 = .003$, interaction between time and stability, $F(2, 243) = 1, p = .166, \eta_p^2 = .015$, and three-way interaction between time, stability, and locus, $F(2, 243) = .764, p = .166, \eta_p^2 = .002$.

Challenge before vs after speech delivery task. To compare challenge before and after speech task, we ran a $3 \times 2 \times 2$ MANOVA with repeated measures on threat before vs. after speech task (time). This analysis revealed a significant main effect of time, $F(1, 243) = 16.38, p < .001, \eta_p^2 = .063$. This indicated that, irrespective of condition, participants reported less challenge before ($M = 3.5, SD = 1.07$) than after the speech delivery task ($M = 3.77, SD = 1.24$). The main effect of locus was significant as well, $F(1, 243) = 8.09, p = .005, \eta_p^2 = .032$. This indicated that participants who attributed the rejection to gender discrimination reported more challenge ($M = 3.46, SD = 1.04$) than participants who attributed the rejection to lack of ability ($M = 3.83, SD = 1.00$).

This analysis revealed no other significant main or interaction effects: Main effect of stability, $F(2, 243) = 1.33, p = .267, \eta_p^2 = .011$, interaction between time and stability, $F(2, 243)$

= .88, $p = .417$, $\eta_p^2 = .007$, interaction between time and locus, $F(1, 243) = 2.51$, $p = .114$, $\eta_p^2 = .010$, and three-way interaction between time, stability, and locus, $F(2, 243) = .26$, $p = .774$, $\eta_p^2 = .002$.

Helpless before vs. after speech delivery task. To compare helplessness before vs. after the SPD across conditions, a 2 (Gender discrimination vs. Lack of ability) x 3 (Stable vs. Unstable vs. Control) x 2 (Time: Helplessness before vs. after speech task) ANOVA with repeated measures of helplessness was conducted. The analysis revealed a significant effect of time (before vs. after), $F(1, 243) = 8.63$, $p = .004$, $\eta_p^2 = .034$, that was unqualified by condition. Irrespective of condition, participants reported more helplessness before ($M = 2.77$, $SD = 1.65$) than after ($M = 2.48$, $SD = 1.71$) the SPD task. The main effect of locus on helplessness was significant too, $F(1, 243) = 5.76$, $p = .017$, $\eta_p^2 = .023$ and indicated that participants who attributed their rejection to lack of ability, reported more helplessness ($M = 2.85$, $SD = 1.55$) than participants who attributed rejection to gender discrimination ($M = 2.39$, $SD = 1.41$). This analysis revealed no other significant main effect or interactions: Main effect of stability, $F(1, 243) = .94$, $p = .393$, $\eta_p^2 = .008$, interaction between time and locus, $F(1, 243) = 1.57$, $p = .212$, $\eta_p^2 = .006$, interaction between time and stability, $F(2, 243) = .69$, $p = .502$, $\eta_p^2 = .006$, and three-way interaction between time, locus, and stability, $F(2, 243) = .5$, $p = .606$, $\eta_p^2 = .004$.

Appraisals of the speech delivery task

Appraisals before speech delivery task. To analyse appraisals before speech delivery task, a 3 (Stable vs. Unstable vs. Control) x 2 (Gender discrimination vs. Lack of ability) ANOVA was conducted. This revealed a significant main effect of locus, $F(1, 249) = 7.34$, $p = .007$, $\eta_p^2 = .029$, indicating that participants who attributed the rejection to discrimination appraised the speech delivery task slightly more positively ($M = 3.94$, $SD = 1.16$) than participants who attributed the rejection to lack of ability ($M = 3.53$, $SD = 1.23$). The analysis

did not show any significant effect of stability, $F(2, 249) = 2.20, p = .113, \eta_p^2 = .018$, and no significant interaction between locus and stability, $F(2, 249) = 1.65, p = .312, \eta_p^2 = .010$.

Appraisals after speech task. A 3 (Stable vs. Unstable vs. Control) x 2 (Gender discrimination vs. Lack of ability) ANOVA revealed no significant effects on appraisals after the speech task: Locus, $F(1, 249) = .04, p = .834, \eta_p^2 < .001$, stability, $F(2, 249) = .28, p = .759, \eta_p^2 = .002$, interaction between locus and stability, $F(2, 249) = .07, p = .933, \eta_p^2 = .001$ ($M_{\text{Total}} = 4.05, SD = 1.51$).

Gender identification. To examine the effects of stability and locus on gender identification, we ran a 3 x 2 ANOVA. The results revealed no significant effect of stability, $F(2, 243) = 2.54, p = .081, \eta_p^2 = .020$ ($M_{\text{Total}} = 5.57, SD = 1.19$).

Correlations. I examined the correlations between attributions and emotions. This revealed a positive and significant association between attributions to lack of ability and threat reported before ($p < .001$) and after ($p = .043$) the speech task, and a negative association between attributions to lack of ability and challenge reported before ($p < .001$), but not after ($p = .172$) the speech task. So, the more participants made attributions to their lack of ability, the more they reported threat before and after the speech task, and the less they reported challenge before the speech task.

Attributions to gender bias were significantly and negatively correlated to threat before ($p = .041$), but not after ($p = .972$) the speech task. These attributions were positively and significantly correlated with challenge before the speech task ($p < .001$), but not with challenge after the speech task ($p = .07$). This indicates that the more participants made attributions to gender bias, the less they reported threat before the speech (for the complete correlations see Table 6.1).

In sum, these analyses confirm that attributions to lack of ability were associated with more self-reported threat and less self-reported challenge emotions, but that attributions to gender discrimination were associated with less threat.

Table 6.1

Correlations between the self-reported dependent variables

	1	2	3	4	5	6
1. Threat before SPD	-					
2. Threat after SPD	.61***	-				
3. Challenge before SPD	-.46***	-.37***	-			
4. Challenge after SPD	-.48***	-.64***	-.6***	-		
5. Attributions to lack of ability	.29***	.13*	-.27***	-.09	-	
6. Attributions to gender bias	-.13*	-.002	.23***	.12†	-.68***	-

 † < .07. * $p < .05$. ** $p < .005$. *** $p < .001$

6.3.2 Results of Cardio-Vascular Responses

Following well-established guidelines (see Blascovich, Spencer, Quinn, & Steele, 2001; Blascovich et al., 2011), in order to analysing CV responses, I followed three steps. First, I tested for the possible condition differences during the last minute of the baseline. The baseline period occurred before the manipulation took place, so I would not expect any significant condition difference across HR, PEP, CO, and TPR. Next, after creating reactivity scores (i.e., difference scores representing the difference between task and baseline) I examined task-engagement. To do so, I tested HR and PEP reactivity scores against zero (i.e., baseline). Finally, to examine the hypotheses, I tested whether the independent variables influenced CV responses indicative of challenge and threat. To this end I tested for between-condition differences in CO and TPR as well as a combined threat-challenge index (TCI).

I calculated the mean levels of HR (Heart Rate), PEP (Pre-Ejection Period), CO (Cardiac Output), and TPR (Total Peripheral Resistance) for the last minute of the baseline, the last minute of preparation time before the speech task, and the first minute of the actual speech. Four separates 3 (Stable vs. Unstable vs. Control) x 2 (Gender discrimination vs. Lack of ability) ANOVAs were conducted to test possible differences across conditions during baseline. These revealed that there were no significant effects $F_s < 1.40, p_s > .149$.

At this stage, I computed difference scores to reflect the difference between each indicator during the preparation or speech periods and baseline (i.e., reactivity scores). These scores were then examined for outliers, which here are defined as values 3.3 SD greater or smaller than the mean (Seery, Blascovich, Weisbuch, & Vick, 2004). These outliers were changed to a value of 1% higher/lower than the adjacent non-outlying value (see Weisbuch-Remington et al., 2005; Van Beest & Scheepers, 2013). I also calculated Threat/Challenge Indices (TCI) for both preparation and speech task periods. To calculate the TCI, CO and TPR values were first transformed into Z scores and then TPR was multiplied by -1. Then I applied

the following formula: $TCI = Z_d_TPR + Z_d_CO$ (Blascovich, Seery, Mugridge, Norris, & Weisbuch, 2004). Higher TCI indicates higher challenge, whereas lower TCI would be an indicator of greater threat (Scheepers, Röell, & Ellemers, 2015).

Task engagement during the preparation period. To indicate engagement during preparation and SPD periods, reactivity scores should be significantly higher than zero (positive) for HR, and significantly lower than zero (negative) for PEP. One-sample *t*-tests indicated that during the preparation period, only HR reactivity showed a significant increase from baseline, $t(221) = 5, p < .001$ ($M = 1.96, SD = 5.82$), $d = .34$, while PEP reactivity did not show a significant difference from baseline, $t(221) = .06, p = .950$ ($M = .04, SD = 8.54$), $d = .004$. This indicates moderate task engagement during preparation time, especially since PEP is a more direct index of task engagement (Brenner, Beachaine, & Sylvers, 2005; Kelsey, 2012).

Task engagement during the speech delivery task. In this period, mean level of HR significantly increased from baseline, $t(221) = 20.25, p < .001$ ($M = 11.51, SD = 8.47$), $d = 1.36$, while mean levels of PEP were reduced compared to baseline, $t(221) = -7.11, p < .001$ ($M = -5.07, SD = 10.62$), $d = -.48$, revealing strong evidence for task engagement during the speech delivery task.

Effects of the manipulations on CO and TPR during speech preparation—Hypotheses 2 (a and b) and 4 (a and b). Two 3 x 2 ANOVAs tested the effects of the independent variables (stability and locus) on CO and TPR as indicators of threat and challenge. This analysis was conducted twice, first for the preparation period and subsequently for the SPD period.

With respect to the preparation period, for CO, the ANOVA revealed no significant main effect of stability, $F(1, 216) = 1.02, p = .362, \eta_p^2 = .009$. The main effect of locus, $F(1, 216) = 2.63, p = .106, \eta_p^2 = .012$, and the interaction between locus and stability were not

significant, $F(1, 216) = 2.07, p = .128, \eta_p^2 = .019$. Although no significant interaction effect was found, given my interest in examining whether stability functioned in the same way for the two loci, I probed the simple effects. These indicated that stability affected CO when rejection was attributed to gender discrimination (rare: $M = .11, SD = .56$; pervasive: $M = -.15, SD = .52$), $F(2, 216) = 2.94, p = .055, \eta_p^2 = .026$, but not when rejection was attributed to lack of ability, (fixed: $M = .08, SD = .40$; malleable: $M = .03, SD = .55$), $F(2, 216) = 1.00, p = .908, \eta_p^2 = .001$. In addition, when attributions were perceived as stable (pervasive/fixed), CO was significantly higher (indicating more challenge) when participants attributed their rejection to ability than to discrimination (ability: $M = .08, SD = .40$; gender discrimination: $M = -.15, SD = .52$), $F(1, 216) = 4.40, p = .037, \eta_p^2 = .020$. This difference between the two loci did not emerge when attributions were perceived as unstable (rare/malleable), $F(1, 216) = .45, p = .502, \eta_p^2 = .002$ or in the control conditions, $F(1, 216) = 1.90, p = .170, \eta_p^2 = .009$.

In sum, analyses of differences in CO markers of motivational state across conditions suggest more threat when participants attributed the rejection to stable/pervasive discrimination than in any other condition, providing evidence that attributional stability has the predicted effect, but only for attributions to discrimination and supporting hypothesis 2a but not 2b.

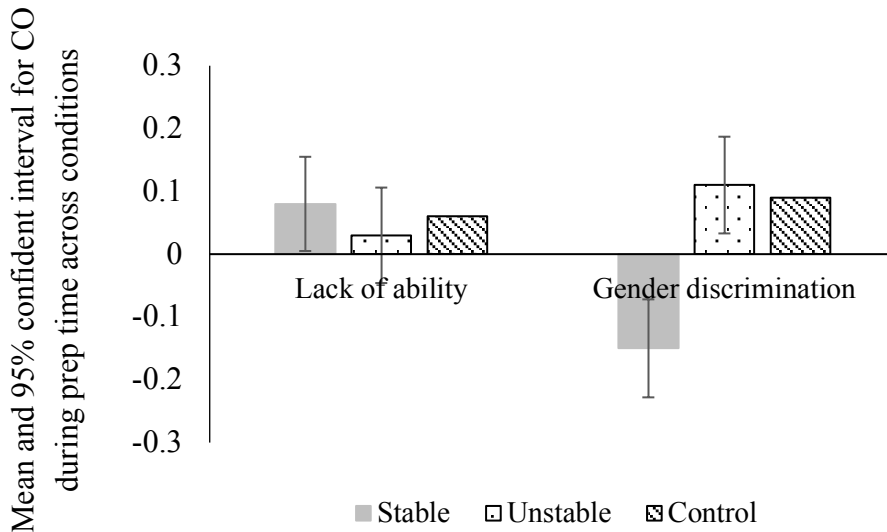


Figure 6.4. CO during preparation time across conditions

Regarding TPR, the ANOVA revealed no significant main effect of locus, $F(1, 186) = .05, p = .827, \eta_p^2 < .001$, and no significant effect of stability, $F(2, 186) = 1.85, p = .160, \eta_p^2 = .020$. However, the interaction between locus and stability was significant, $F(2, 216) = 4.04, p = .019, \eta_p^2 = .042$. This interaction indicated that stability had the predicted significant effect on TPR when the rejection was attributed to discrimination, $F(2, 186) = 5.09, p = .007, \eta_p^2 = .052$. More specifically, participants who attributed the rejection to gender discrimination had significantly lower TPR in the unstable discrimination condition (rare: $M = -129.85, SD = 328.37$) than in the stable discrimination condition (pervasive: $M = 119.43, SD = 363.44$), $t(191) = -3.18, p = .005, 95\% CI [-438.15, -60.41], d = .72$. There was no significant difference between the control condition and the pervasive condition, $t(191) = -1.71, p = .266, 95\% CI [-338.30, 57.66], d = .40$, or rare discrimination condition, $t(191) = 1.36, p = .529, 95\% CI [-84.95, 302.87], d = .33$. By contrast, stability did not affect TPR when the rejection was attributed to lack of ability, $F(2, 186) = .80, p = .452, \eta_p^2 = .008$ (see Figure 6.5). These results provide evidence for my predictions regarding attributional stability, but only for attributions to discrimination (hypothesis 4a) and not for attributions to lack of ability (hypothesis 4b).

Moreover, when attributions were stable, participants who attributed the rejection to lack of ability had significantly *lower* TPR (indicative of challenge; $M = -49.97$, $SD = 331.12$) than participants who attributed the rejection to gender discrimination ($M = 119.43$, $SD = 363.44$), $F(1, 186) = 4.70$, $p = .032$, $\eta_p^2 = .025$. By contrast, when attributions were unstable, participants who attributed the rejection to lack of ability tended to show *higher* TPR (indicative of threat; $M = -2.32$, $SD = 320.13$) than when they attributed the rejection to discrimination ($M = -129.85$, $SD = 328.37$), $F(1, 186) = 2.66$, $p = .105$, $\eta_p^2 = .014$. In the control conditions, there was no significant difference in TPR across attributional loci, $F(1, 186) = .74$, $p = .391$, $\eta_p^2 = .004$. In sum, analyses of TPR across conditions suggest that participants experienced more threat when they attributed the rejection to stable/pervasive discrimination than in any other condition, again supporting hypothesis 2a, but not 2b.

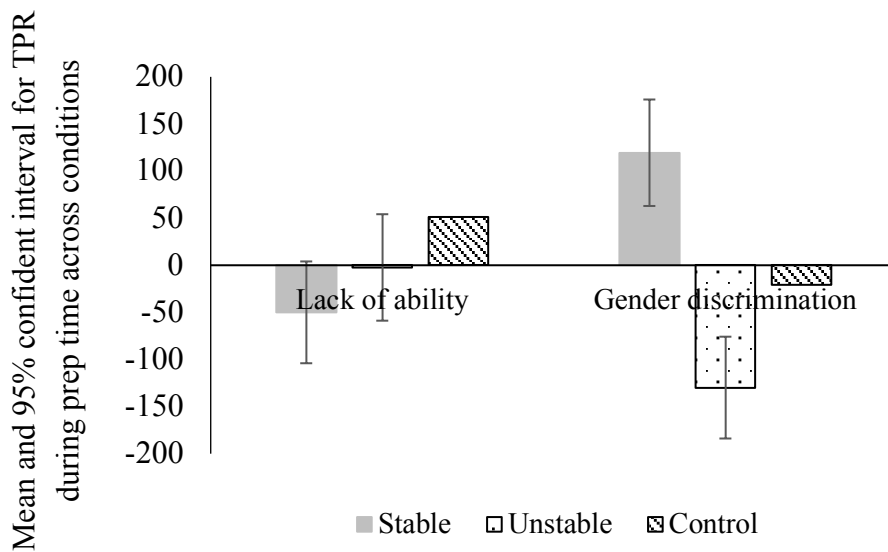


Figure 6.5. TPR during preparation time across conditions

Table 6.2 additionally displays the difference between each CV reactivity score (during preparation time) and the respective baseline value (with one-sample t -tests testing difference to zero). These analyses do not reveal any significant differences. However, the pattern of means suggest that CO decreased from baseline ($p = .099$) and TPR increased from

baseline ($p = .073$), in both cases suggesting threat. By contrast, TPR was significantly *lower* than baseline when gender discrimination was unstable/rare. No other means were significantly different from zero, $ps > .183$. Although not as clearly as desirable, these results underscore the idea that whereas stable/pervasive gender discrimination induces threat, unstable/rare gender discrimination can instead be associated with challenge. Again, and attributional stability had no comparable effects when participants made attributions to lack of ability.

Table 6.2

Means (and SDs) and results of t-tests of reactivity during preparation time for each condition

Discrimination	Stable/Pervasive		Unstable/Rare		Control	
	CO	TPR	CO	TPR	CO	TPR
<i>M (SD)</i>	-.15(.52)	119.43 (363.44)	.11 (.56)	-129.85(328.36)	-.09 (.39)	-20.89(335.31)
95% CI	-.33, .03	-11.61, 250.46	-.08, .29	-242.65, -17.06	-.22, .04	-148.44, 106.65
<i>t</i>	-1.7†	1.86†	1.15	-2.34*	-1.36	-.34
<i>d</i>	-.29	.33	.20	-.40	-.23	-.06

Ability	Stable/Fixed		Unstable/Malleable		Control	
	CO	TPR	CO	TPR	CO	TPR
<i>M (SD)</i>	.08 (.4)	-49.97 (331.12)	.03 (.55)	-2.32 (320.13)	.06 (.33)	51.35 (206.2)
95% CI	-.05, .21	-163.72, 63.77	-.15, .22	-117.74, 113.1	-.05, .17	-27.1, 129.78
<i>t</i>	1.22	-.89	.36	-.04	1.15	1.34
<i>d</i>	.2	-.15	.06	-.01	.18	.26

†<.100. **p*<.05. ** *p*<.005. *** *p*<.001

Effects of the manipulations during the speech delivery task. I then conducted the same analyses focusing on CO and TPR during the speech delivery task. At this stage, the ANOVA indicated no significant effects on CO: No significant effect of locus, $F(1, 216) = 2.12, p = .147, \eta_p^2 = .010$, no significant effect of stability, $F(2, 216) = 1.91, p = .150, \eta_p^2 = .017$, and no significant interaction between locus and stability, $F(2, 216) = 1.33, p = .267, \eta_p^2 = .012$.

An ANOVA testing the effects of locus and stability on TPR during the speech task period, also revealed no significant main effects or interaction: Main effect of locus, $F(1, 216) = .47, p = .492, \eta_p^2 = .003$, main effect of stability, $F(2, 216) = .63, p = .532, \eta_p^2 = .007$, and interaction between locus and stability, $F(2, 216) = .49, p = .617, \eta_p^2 = .005$.

Table 6.3 displays the difference between each reactivity score and the baseline for each condition, during the speech task. The results of one-sample t -tests (against zero) indicated that CO was significantly higher than baseline (indicating challenge) when gender discrimination was rare, when ability was malleable, and when ability was fixed. This analysis revealed no other significant results, $ps > .102$.

Table 6.3

Means (and SDs) and results of t-tests of reactivity during the speech delivery task for each condition

Discrimination	Stable/Pervasive		Unstable/Rare		Control	
	CO	TPR	CO	TPR	CO	TPR
<i>M (SD)</i>	.04 (.56)	37.59 (472.97)	.34 (.76)	-48.83 (611.5)	.05 (.43)	65.51 (415.11)
95% CI	-1.15, .24	-130.12, 205.3	.09, .59	-269.3, 171.64	-.1, .2	-98.7, 229.73
<i>t</i>	.48	.46	2.71**	-.45	.74	.82
<i>d</i>	.07	.08	.45	-.08	.12	.16
Ability	Stable/Fixed		Unstable/Malleable		Control	
	CO	TPR	CO	TPR	CO	TPR
<i>M (SD)</i>	.34 (.58)	-103.42(472.16)	.3 (.79)	-27.7 (480.9)	.17 (.62)	38.3 (428.1)
95% CI	.16, .53	.16, .53	.04, .56	-204.09, 148.7	-.04, .38	-131.05, 207.65
<i>t</i>	3.7**	-1.39	2.31*	-.32	1.68	.47
<i>d</i>	.64	-.22	.38	-.06	.27	.09

* $p < .05$. ** $p < .01$. *** $p < .001$

Threat/Challenge Indices for preparation and speech delivery (TCI). In two 3 x 2 separate ANOVAs, I examined effects of locus and stability on TCI during preparation time and during the speech delivery task. Regarding the TCI during speech preparation, the results revealed no significant main effect of locus, $F(1, 186) = .44, p = .510, \eta_p^2 = .002$ and no significant main effect of stability, $F(2, 186) = 1.86, p = .158, \eta_p^2 = .020$. However, the analysis revealed a significant interaction between the independent variables on TCI during preparation, $F(2, 186) = 3.80, p = .024, \eta_p^2 = .039$.

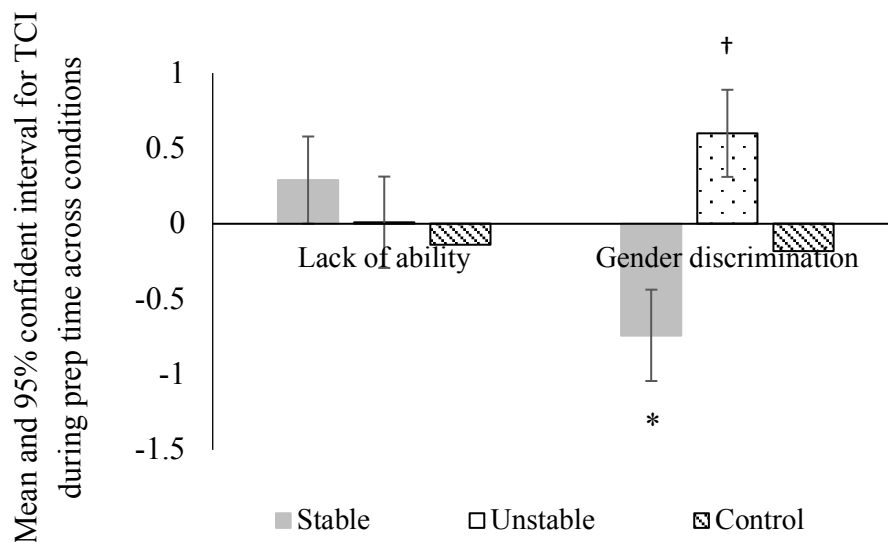


Figure 6.6. Comparing TCI during preparation time across conditions

Simple effects confirmed that when attributions were stable, CV markers of motivational state indicated *greater* threat when participants attributed rejection to discrimination ($M = -.74, SD = 1.95$) than to lack of ability ($M = .29, SD = 1.67$), $F(1, 186) = 6.11, p = .014, \eta_p^2 = .032$. However, when attributions were unstable, there was no significant difference in TCI across locus, $F(1, 186) = 1.95, p = .165, \eta_p^2 = .010$. Also, TCI did not vary across locus in the control condition, $F(1, 186) = .01, p = .929, \eta_p^2 < .001$.

Also, stability had a significant effect on TCI during preparation time when participants attributed the rejection to discrimination. More specifically, attributions to

stable/pervasive discrimination were associated with greater threat ($M = -.74$, $SD = 1.95$) than attributions to unstable/rare discrimination ($M = .60$, $SD = 1.92$), $t(191) = -3.19$, $p = .005$, 95% CI [-2.35, .5], $d = .69$. There was no significant difference between the control condition and the pervasive condition in the TCI, $t(191) = 1.29$, $p = .600$, 95% CI [-.50, 1.62], $d = .32$, or between the control condition and the rare discrimination condition, $t(191) = -1.8$, $p = .221$, 95% CI [-1.81, .27], $d = .44$. Stability did not affect threat among participants in the ability conditions, $F(2, 186) = .53$, $p = .591$, $\eta_p^2 = .006$. In sum, the results from speech task preparation period indicated that the diverging condition is the stable/pervasive discrimination condition, where CO (and TCI) is lowest, and TPR is highest, indicating threat. This supports hypothesis 2a, indicating more threat when discrimination is stable than unstable, but not hypothesis 2b, as there is no evidence of stability playing a role when the attribution is to lack of ability.

The 3 x 2 ANOVA testing effects of locus and stability on TCI during the speech task period indicated no significant main effect of locus, $F(1, 177) = 1.28$, $p = .259$, $\eta_p^2 = .007$, no significant main effect of stability, $F(2, 177) = 1.52$, $p = .221$, $\eta_p^2 = .017$, and no significant interaction between the two independent variables, $F(2, 177) = 0.87$, $p = .419$, $\eta_p^2 = .010$.

6.3.3 Correlations between CV indicators and self-reports.

Table 6.4 displays the correlations between CO Prep/speech task, TPR Prep/ speech task, TCI Prep/ speech task and self-reported threat before/after, challenge before/after and attributions. This analysis indicated that attributions to ability were positively and significantly correlated with TPR during the preparation time.

Reported threat after the SPD task was significantly and negatively correlated with the TCI ($p = .006$), CO ($p = .007$), and positively with TPR ($p = .023$) during the speech delivery task. There is also a trend for a negative relationship between self-reported threat and CO during the preparation period ($p = .105$). Finally, reported challenge after the SPD task was significantly and positively related to the TCI ($p = .017$) and CO ($p = .026$), but negatively to

TPR during the speech task ($p = .027$). These results indicate some consistency between self-reported threat and challenge and CV markers of these states (for full results see Table 6.4).

Table 6.4

Correlations between CV markers and self-reported measures

	1	2	3	4	5	6
1. CO Prep	-					
2. TPR Prep	-.515***	-				
3. CO SPD	.501***	-.212**	-			
4. TPR SPD	-.274***	.573***	-.622***	-		
5. TCI Prep	.870***	-.870***	.399***	-.478***	-	
6. TCI SPD	.460***	-.455***	.904***	-.898***	.521***	-
7. Attributions to ability	.012	.199**	.04	.09	-.129	-.034
8. Attributions to discrimination	-.099	-.127	-.144	-.023	.028	-.055
9. Threat before	-.198**	.07	-.104†	.094	-.133†	-.104†
10. Threat after	-.109	-.027	-.182**	.168*	-.029	-.203**
11. Challenge before	.091	-.035	.101	-.056	.09	.088
12. Challenge after	.055	.006	.150*	-.164*	.03	.176*

† <.161. * $p < .05$. ** $p < .005$. *** $p < .001$

6.4 Discussion

This study aimed to further investigate whether attributions to discrimination and to lack of ability are more threatening when they are perceived as stable than when they are perceived as unstable—when they might, instead, be experienced as challenging. The checks indicated that I successfully manipulated both attributional locus and stability. However, at the self-reported level, no significant effects of stability were observed on threat and challenge emotions—only significant effects of locus. Specifically, participants in the ability condition reported more threat than challenge, and also more threat than participants in the gender discrimination condition. Also, participants reported more helplessness in the ability than in the discrimination conditions.

Interestingly, however, the results of the cardiovascular indicators were quite different. At this level, although attrition rate was the highest, I found significant effects of stability, generally indicating more threat among participants who were in the stable/pervasive discrimination than in any other condition. By contrast, attributional stability had no significant effects on CV indicators when participants attributed the rejection to lack of ability. There were only significant effects during the speech preparation period—no significant effects were observed on CV indicators during the actual speech task. Although there was only moderate engagement during the preparation phase, task engagement was clearer during the speech task.

What might have caused this discrepancy between self-reported and physiological measures? First, it is important to note that the value of physiological measures lies partly in their ability to offer unique information that is not necessarily available to conscious awareness. So, while participants may have been generally more conscious of threat when making attributions to ability, their cardiovascular responses indicated otherwise, but this was affected by information about the stability of attributions. An alternative explanation is that self-reported measures tap into what people want to communicate about their experiences, whereas

physiological measures tap into their biological readiness to respond to threat or challenging stimuli, irrespective of whether or not individuals are conscious of how they appraise these stimuli. If so, then researchers need to be aware that what people communicate about their experiences does not necessarily overlap with how these are experienced at a more physiological level—and conditions that might make people more aware of how their body is responding might significantly change patterns in self-reported measures.

Despite these open questions, physiological experiences are informative of how prepared one is to cope with a stressor. Participants in this study appear to feel better prepared to deal with a stable attribution if it refers to fixed ability than to pervasive discrimination. There is also some evidence that participants appear to experience greater preparedness to deal with unstable/rare discrimination than with stable/pervasive discrimination. As Foster, Jackson, Hartmann, and Woulfe (2004) discuss, when women face pervasive discrimination, they tend to redefine this pervasiveness in order to make it a less stressful event. The current findings move the field forward by providing direct evidence for the threat experienced by those who make these attributions and appear to confirm Schmitt and Branscombe's (2002) argument that pervasive discrimination is more threatening than rare discrimination.

It is yet unclear why I did not find evidence that stability similarly affect experiences when individuals make attributions to ability. People might have clearer ideas regarding whether or not their ability can be improved compared with stability/pervasiveness of discrimination. Due to this knowledge, perhaps participants in the ability condition had better coping options (or were more ready to cope) than participants in the discrimination condition who just received information with regards to stability/pervasiveness of discrimination.

Correlations between self-report and CV measures also reveal some interesting insights. For example, there was a significant association between reported threat after speech delivery with psychophysiological indexes of threat during the speech delivery task, while

challenge reported after speech delivery was linked to CV indexes of challenge. This shows some consistency between reported threat and challenge and CV indexes of threat and challenge.

Moreover, the findings contribute to the literature by clarifying that neither of these two types of attributions is more or less threatening than the other, unless stability is taken into account. Indeed, the findings show that experiences of threat or challenge did not differ in control conditions, i.e., in the absence of information about attributional stability. That is, in the absence of explicit information about stability, the two attributions were equally threatening/challenging. The two attributions mainly generated different experiences when they were perceived as stable (fixed ability and pervasive discrimination)—in which case, attributions to discrimination were experienced as more threatening. When attributions were perceived as unstable there was some evidence of a tendency for the opposite response, i.e., more threat when making attributions to malleable ability than to rare discrimination. In sum, information about the stability of attributions does not seem to be salient by default but when it is explicitly considered it can influence not only how a specific attribution is experienced, but also whether it is experienced as more threatening than an alternative attribution.

One of the limitations of this study is that the feedback given by the interviewer in the ability condition might have inadvertently created an experience of subtle discrimination. In this feedback it was mentioned that the participant failed to show leadership potential. As research has indicated that women are negatively stereotyped in leadership roles (Hoyt & Blascovich, 2007; Powell, Butterfield, & Parent, 2002), this feedback might have led participants to think that they had encountered subtle gender discrimination. Though this is not what I intended to do, it is important to observe that there is significant overlap between the conditions in which people attribute a negative outcome to ability and situations of subtle discrimination. As demonstrated repeatedly in past research, subtle discrimination elicits

precisely a focus on the self and its limitations and induces attributions to lack of ability (Barreto, 2014; Barreto & Ellemers, 2015 for a review). I, therefore, do not think this invalidates my findings, though this is an issue that can be addressed by future research.

Though I took significant steps to make the two loci of attributions parallel in this study, it is important to reflect further on the differences between stability of discrimination and of ability, given that my results show they have very different implications. For example, even when focusing in both cases on stability across time, as I did in study 3, stability of discrimination and of ability still have different implications for predictability and controllability. But it is important to point that this is in fact partly inherent to the distinction between these two loci of attributions. Because attributions to (lack of) ability are internal and attributions to discrimination are partly internal and partly external, they involve different degrees of predictability and perceived control—and this has consequences for perceived responsibility. For example, while malleability of ability refers to personal improvement and can be seen to imply that the person is responsible for this improvement, malleability of discrimination only refers to whether or not discrimination is likely to happen again, with less of an implication that it is up to the individual to avoid it. That is, one is more likely to be seen as responsible for a negative outcome obtained due to unstable (in)ability than for a negative outcome obtained due to unstable discrimination. Though some of this is likely to be inherent to the distinction between these two loci of attributions, and indeed the focus of my thesis, future research can focus on bringing them closer when operationalising them for empirical studies, for example by clarifying whether or not personal responsibility is implied.

It is important to note that in this study participants only received information about stability of one of the attributions and not both and they were led to make attributions to either discrimination or lack of ability. When receiving information about stability of both attributions, however, one might be more likely to make alternative attributions which are less

threatening for them. As such, perceived threat and challenge might affect the extent to which one specific attribution is made. This notion is tested in the next study, where information about both attributions were given to the participants.

7 When do People Attribute Negative Outcomes to Lack of Ability and Discrimination: The Role of Attributional Stability

For members of socially stigmatised groups, the possibility that a negative outcome is due to discrimination against their social group is ever present (Steele, 1997). While some have argued that this creates an opportunity to deflect personal responsibility for negative outcomes by attributing them to discrimination (e.g., Major & Crocker, 1989), others have pointed out that doing so also has important costs and is, therefore, likely to be avoided (Schmitt & Branscome, 2002). Whether or not members of socially stigmatized groups are motivated to make attributions to discrimination has been the focus of much discussion in this area of research (see Barreto & Ellemers, 2015 for a more complete discussion). However, little research has directly examined when members of stigmatized groups make these attributions to discrimination or the factors that might affect whether or not these attributions are made. In the previous chapters of this thesis, I examined emotional costs of these attributions and how they are affected by attributional stability. In this chapter, I examine whether attributional stability influences the extent to which members of stigmatized groups make attributions to discrimination or to lack of ability.

Members of a range of socially stigmatised groups, such as ethnic minorities, sexual minorities, individuals with a disability, and women are likely to encounter discrimination against their groups in a variety of contexts and domains (Stroebe, Dovidio, Barreto, Ellemers, & John, 2011; Foster, 2009; Pizer, Mallory, & Sears, 2012; McClauskey, 1988). For this reason, discriminatory and unjust treatment is always a conceivable cause of negative outcomes for members of stigmatised groups (Major & Crocker, 1989). However, making attributions to discrimination is not straightforward. For one, targets do not always detect that their negative outcomes are due to discrimination because discriminatory treatment often takes very subtle

forms, and the evidence that is necessary to ascertain that discrimination has taken place is often not readily available (Barreto, 2014; Ellemers & Barreto, 2015).

Some scholars discuss that the attributional ambiguity subtlety provides members of stigmatised groups with an opportunity to deflect personal responsibility and instead blame prejudiced others for the negative outcomes they receive. In line with this reasoning, Crocker and Major (1989) argued that members of stigmatised groups might actually prefer to make attributions to discrimination rather than to personal deservingness (i.e., lack of ability). More specifically, based on Kelly's (1973) discounting hypothesis⁵, Crocker and Major (1989; Major & Crocker, 1993) argued that attributing an outcome to discrimination would discount targets' personal responsibility for the negative outcome and thereby protect them from the threatening consequences of making attributions to lack of ability. Crocker, Voelkl, Testa, and Major (1991) further argued that this might explain why members of socially stigmatized groups do not, overall, have lower global personal self-esteem than members of non-stigmatized groups. Indeed, they stated that "members of stigmatised groups who generally believe that they are discriminated against or that others are racist should be more likely to attribute negative feedback to prejudice and therefore may be higher in self-esteem" (Crocket et al., 1991, p. 226).

Sechrist, Swim, and Stangor (2004) proposed a similar preference for making attributions to discrimination but for a different reason. According to these researchers, people may be motivated to attribute a negative outcome to discrimination, rather than to their lack of ability, to increase or secure a sense of control over their future outcomes. The assumption is that ability is something the individual carries with them across time and context, whereas discrimination is not necessarily 'attached' to the individual and can therefore be avoided.

⁵ Kelly's (1973) discounting hypothesis proposes that "the role of a given cause in producing a given effect is discounted if other plausible causes are also present" (p. 113).

However, both of these arguments underlying the idea that individuals might be motivated to make attributions to discrimination can be questioned. With regard to the self-protection argument, researchers have pointed out that perceiving oneself or one's group as target of discrimination can be highly threatening, and, therefore, one might be rather reluctant to make such attributions. Indeed, because attributions to discrimination make devaluation and exclusion salient, they can be highly threatening to the individual's fundamental need to belong (Baumeister & Leary, 1995; Carvallo & Pelham, 2006). In addition, although in a different way than attributions to lack of ability, attributions to discrimination are also threatening to an individual's self-concept, i.e., to the part of their (social) identity that is at the basis of the negative treatment. That is, making an attribution to discrimination can imply an acknowledgement that an important part of one's identity is devalued by others (Schmitt & Branscombe, 2002) and is, therefore, not necessarily more self-protective than making an attribution to lack of ability.

With regard to feelings of control, the argument by Sechrist et al. (2004) implies that discrimination does not threaten one's sense of control over one's life. However, if discrimination is very stable one might actually feel very little control over one's life or one's outcomes. Indeed, an important step forward in this area of research was the demonstration that attributions to discrimination have different effects depending on how stability discrimination is perceived to be. Schmitt and Branscombe (2002) proposed that attributions to discrimination are likely to be more threatening when they are perceived to be stable (i.e., stable across time and context), compared to when they are perceived to be unstable (i.e., unstable across time and context) (Schmitt & Branscombe, 2002; Schmitt et al., 2003; Stroebe et al., 2011). Moreover, these authors demonstrated that when discrimination is perceived to be unstable, attributions to discrimination can indeed have self-protective effects, but this is not the case when discrimination is perceived as stable. If so, then attributions to discrimination do not

necessarily protect one's sense of control, and members of stigmatised groups are unlikely to be keen to make attributions to discrimination (Crosby, Pufall, Snyder, O'Connell, & Whalen, 1989).

The argument by Sechrist et al. (2004) also implies that ability is perceived as more stable than discrimination. However, an ample body of research has demonstrated that people differ in the extent to which they believe their ability is stable or unstable (Dweck, 1986; Dweck & Leggett, 1989). If so, then, just as argued for discrimination, the perceived stability of ability can moderate the extent to which attributions to lack of ability are seen as threatening. Work by Dweck and colleagues suggests that setbacks attributed to ability that is perceived as stable are followed by responses suggestive of threat, such as poorer performance and task disengagement, among others (Blackwell, Trzesniewski, & Dweck, 2007; De Castella & Byrne, 2015; Dweck & Sorich, 1999; Hong, Chiu, Dweck, Lin, & Wan, 1999). By contrast, setbacks attributed to ability that is perceived as unstable are more often followed by renewed and redirected efforts to improve performance (Blackwell et al., 2007; Hong et al., 1999; Rhodewalt, 1994). That is, when ability is seen as stable attributions to ability are likely to be perceived as a threat, while attributions to unstable ability are more likely to be experienced as a challenge. Consequently, one might be more willing to make attributions to lack of ability when it is perceived as unstable than when it is perceived as stable. My work, however, reveals a different possibility (see previous chapters): That unstable lack of ability can at times be more threatening than stable lack of ability, potentially because it might point to individual responsibility to improve.

Although previous research has made some inferences about which attributions are preferred by members of stigmatised groups, the role of perceived attributional stability in this process has not yet been directly investigated. Researchers manipulated a number of factors that influence likelihood of attributing failures to discrimination (e.g., stigma consciousness),

but they did not examine whether or not attributional stability affects the extent to which people make attributions to discrimination or to lack of ability (Garstka, Hummert, & Branscome, 2005; Major, Kaiser, & McCoy, 2003; Major et al., 2002; Pinel, 2004). Other researchers compared attributions to discrimination with purely external attributions and their effects on emotions (e.g., everyone was rejected because the professor was ‘a jerk’; Adams, Garcia, Purdie-Vaughns, & Steele, 2006; Major et al., 2003; Schmitt & Branscombe 2002; Schmitt, Branscombe, Kobrynowicz, & Owen, 2002; Schmitt et al., 2003). Therefore, the main goal of this study was to fill in the gap in the literature by examining the extent to which an attribution (to discrimination or ability) is made as a function of the perceived stability of the attribution. I expected that people prefer to avoid threatening attributions and therefore would make those attributions to a lesser extent when these are threatening.

7.1 Overview of the Current Research

Building on the reasoning underlying the research reported in this dissertation, I expected that when attributions are perceived as a threat, they are likely to be avoided, potentially in favour of alternative attributions. To examine this, the stability of attributions to discrimination and to lack of ability were orthogonally manipulated. To maximize the equivalence between the two types of attributions, when either locus of attribution was described as unstable, it was presented as possible to improve over time—i.e., unstable ability referred to the possibility that it can be improved, and unstable gender discrimination referred to reductions in gender discrimination over time. By contrast, when either locus of attribution was described as stable, it was portrayed as very hard to change over time—i.e., stable ability referred to how hard it is to change one’s ability over time and stable discrimination referred to how hard it is to reduce gender discrimination over time. Since I have proposed and found in the earlier studies of this dissertation that stable discrimination is more threatening than unstable discrimination, I predicted that participants are less likely to make attributions to

discrimination when it is described as stable than when it is perceived as unstable (H1). In addition, I expected that when attributions to discrimination are perceived as stable, participants would be likely to make more alternative attributions for their negative outcome—such as attributions to lack of ability (H2). The results of my prior studies also suggest that attributions to lack of ability are highly threatening when ability is perceived as unstable. Although this is not what I had initially expected, the fact that this is what my results suggest, so far, led me to predict that participants would make less attributions to lack of ability when it is perceived as unstable than when it is perceived as stable (H3a). Alternatively, I might find evidence in support of what has been found before, i.e. that stable lack of ability is perceived as more threatening and therefore attributions to ability might be reduced when it is stable compared to unstable (H3b).

In addition, I expected that when attributions to ability are perceived as unstable, participants would make more alternative attributions—such as attributions to discrimination (H4). As a result of the combined information about the stability of both attributions, I expected the highest level of attributions to discrimination when both ability and discrimination are described as unstable (unstable discrimination and unstable ability; H5) and the highest level of attributions to lack of ability when both attributions are described as stable (stable discrimination and stable ability; H6). Although this was not a core aim of this study, I additionally explored the extent to which participants reported feeling threatened or challenged by the different attributions.

7.1.1 Method

Design and Participants. In this study, I orthogonally manipulated the perceived stability of the two types of attributions. To do so, I adapted existing manipulations of implicit theories of ability (stable versus unstable) and of gender discrimination (stable versus unstable). The design was therefore a 2(Perceived stability of ability: Stable vs. Unstable) x 2(Perceived

stability of discrimination: Stable vs. Unstable). As outcome variables, we examined attributions for negative outcomes and associated emotions. For exploratory purposes, I also examine attributions and emotions associated with successes.

All participants were recruited online through a crowdsourcing platform based in the UK called “prolific academic.” The survey was advertised as a study of “your experiences at work.” Because my aim was to examine attributions among members of devalued groups and because the cover story referred to experiences at work, recruitment was restricted to employed women. However, participants were not aware of this restriction. A total of 164 participants took part in this study, but inspection of the data led me to exclude data from four participants. In three cases, participants were male, despite the fact that recruitment had been restricted to women; in another case, the participant was not employed. Out of these 4 exclusions, one was in the stable ability/stable discrimination (2.44%), one was in the stable ability/unstable discrimination (2.33%), and two were in the unstable ability/stable discrimination (4.88%). No participant was excluded from the unstable ability/unstable discrimination condition. Thus, analyses were conducted on the 160 remaining participants (40 in the stable ability/stable discrimination condition, 42 in the stable ability/unstable discrimination condition, 39 in the unstable ability/stable discrimination condition, and 39 in unstable ability/ unstable discrimination condition). No power analyses were conducted prior to the study to determine required sample size.

Procedure. Each participant who agreed to participate read and provided informed consent before being randomly assigned to one of four conditions. Participants read that the study involved two separate and unrelated studies. The “first study,” which in fact consisted of the texts that served to manipulate the independent variables, was described as aiming to understand how people process information and in how much detail. To examine this, participants would read two journal articles (one focusing on each type of attribution) and

answer a few questions about these articles. The “second study,” which in fact contained most of the measures for the actual study, allegedly aimed to understand people’s professional experiences, and involved questions about participants’ work life. Participants also read that taking part in the study was voluntary, that their answers would be anonymous and confidential, and that they could quit the study at any time without prejudice.

After participants indicated their consent, they read two of four articles. Each participant read about ability *and* about gender discrimination, with attributional stability orthogonally manipulated. In the unstable gender discrimination condition, we highlighted that there have been some successful efforts to reduce gender discrimination during the past 20 years and that increasing awareness of discriminatory events makes them easier to be detected both by potential targets and by potential perpetrators. In the stable gender discrimination condition, however, it was mentioned that efforts to reduce gender discrimination have not been successful. As a reason it was mentioned that gender discrimination is expressed in very subtle and insidious ways that makes it hard to detect, and that discrimination is as prevalent now as it was 20 years ago. In the unstable ability condition, participants read that in a study observing participants during 10 years, researchers found that there was an improvement in basic cognitive abilities, and that learning and practice are likely to improve ability. In the stable ability condition, conversely, participants read that in a study observing participants during 10 years, researchers found that there was little change in basic abilities, and that learning and practice had only very small effects (see Appendix D for the full manipulation texts).

The order of these articles was counterbalanced. That is, half of the participants read the article referring to ability first and then the article referring to gender discrimination, whereas the other half of the participants read the articles in the opposite order. No effect of counterbalancing order was found on the results. After each article, participants answered a set

of five questions (used to enhance the cover story) and some manipulation checks (see below for details of the measures).

After reading the articles participants were thanked and progressed to what was allegedly the second study. In this second study, to enhance the cover story, participants first wrote down their occupation, indicated the extent to which they enjoy their work (on scale from 1 to 7, where 1 = “Not at all” and 7 = “Very much”), how good they think they are at their job (on a scale from 1 to 7, where 1 = “Not good at all” and 7 = “Very good”), and how good they are at their job compared to their colleagues (from bottom 10% to top 10%, recoded from 0 to 100 on a slider, with higher scores representing better relative performance).

Next, to focus on negative outcomes and associated attributions, I asked participants to think about *setbacks* that they had experienced recently at work. Participants indicated what attributions they made for these setbacks and how they felt about them on a series of emotion scales commonly used to measure threat and challenge states (see Measures section and Appendix D). Subsequently, for exploratory purposes, I asked participants to think about *successes* they had experienced recently. Again, participants indicated what attributions they made for these successes and how they felt about them with the same items used to assess responses to setbacks (see Appendix D). Since my primary focus was on negative outcomes, the order in which participants were asked to reflect on recent setbacks and successes was not counterbalanced.

After, participants were asked if they had experienced a setback during the past two months that they felt was *due to lack of ability*. Participants who answered ‘yes’ to this question were asked how they felt about this setback by rating the extent to which they experienced each of the emotions used to assess threat/challenge. Next, participants were asked if they had experienced a setback within the past two months that they felt was *due to gender discrimination*. Participants who answered ‘yes’ to this question were again asked to what

extent they experienced the same threat/challenge emotions about this event. Finally, participants provided some demographic information (see Figure 7.1 for the procedure of the study).

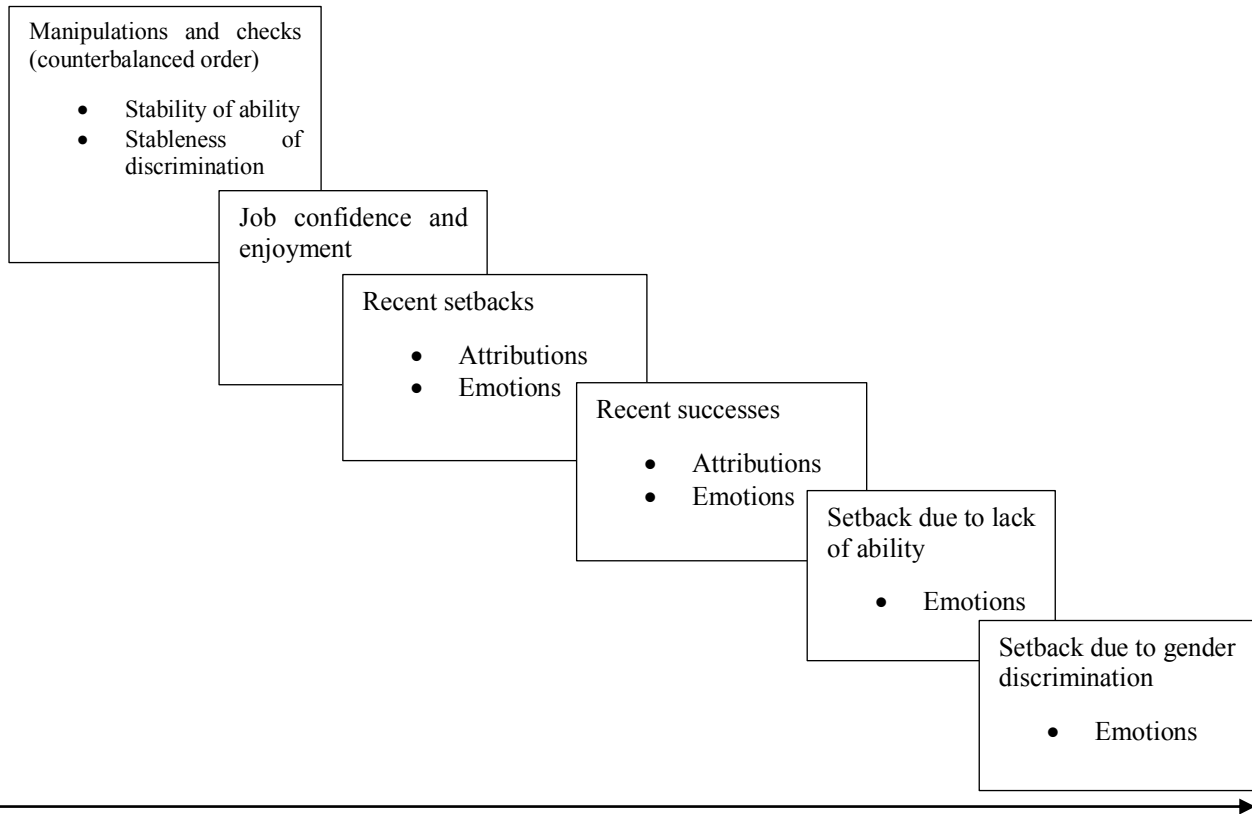


Figure 7.1. Different phases of the study in chronological order

Participants took around 20 minutes to complete this study. When finished, participants were thanked for their participation, debriefed, and paid £2.50 (corresponding to half an hour of working time on the minimum fee of this crowdsourcing platform). The last page of the study indicated the contacts of some support services that could be used by participants experiencing any distress due to the study's focus on positive and negative work-related experiences.

Measures

Manipulation checks. To test if the manipulation of stability of ability was successful, we asked participants to answer the following two questions adapted from Dweck, Chiu, and

Hong's (1995) work on implicit theories of ability: "All in all, to what extent do you think that one's basic cognitive abilities (such as reasoning style) can be changed across one's life?" and "To what extent do you think that one can improve one's performance on tasks that involve these basic cognitive abilities?" Participants indicated their responses on 7-point Likert-type scales (from 1 = "Cannot change at all" to 7 = "Can change/improve very much"). Together, responses to these two questions formed a reliable scale ($r = .84$, $p < .001$) and were averaged for further analyses. Higher scores on this measure indicate a strong belief in the malleability of ability.

To check the manipulation of stability of gender discrimination, participants answered the following two questions "to what extent do you think that gender discrimination is now less prevalent than it was 20 years ago?" and "to what extent do you think that that gender discrimination will continue to be reduced in the future?" Responses were provided on 7 point Likert-type scales, from 1 = "Not at all" to 7 = "Very much". Responses to these two items formed a reliable scale ($r = .72$, $p < .001$) and were averaged for further analyses. Higher scores on this measure indicate a strong belief that discrimination can be reduced.

We also measured participants' beliefs regarding the stability of ability and of gender discrimination, after debriefing, to obtain an individual difference measure of participants' beliefs. This was to check participants' own views about prevalence of gender discrimination and stability of ability. To do this we asked the same two questions that we used as the manipulation check, both scales were reliable, (for ability $r = .83$, $p < .001$, for discrimination $r = .64$, $p < .001$).

Attributions for recent setbacks at work. To focus participants on their setbacks, we started by asking them to indicate how often they had experienced setbacks at work (from 1 = "Never" to 7 = "Very frequently"). Attributions of recent setbacks at work to lack of ability were measured with two items: "I think my setbacks were generally due to not having enough

ability at the tasks I had to perform” and “I think my setbacks were generally due to not being sufficiently good at what I was asked to do” (responses provided on a 7 point Likert-type scale from 1 = “Not at all” to 7 = “Very much”). These items formed a reliable scale ($r = .82, p < .001$) and were averaged for further analyses, with higher scores representing stronger attributions to (lack of) ability. Attributions of recent setbacks at work to gender bias were measured with one item: “I think my setbacks were due to other people’s negative attitudes about my gender group.” Higher scores on this measure reflect stronger attributions to gender discrimination.

Main cause of setbacks. I asked participants to pick the main cause of the setbacks they had recently experienced at work. Options were: Lack of ability, bad luck, negative attitudes towards ethnic group, negative attitudes towards socio-economic group, and negative attitudes towards gender group. I then asked participants to focus on a specific setback they experienced recently and briefly describe what the setback was. Then I asked participants to pick the main cause for this specific setback, with the same options as above.

Attributions for recent successes at work. Attributions of recent successes to ability were measured with two items: “I think my successes were generally due to having enough ability at the tasks I had to perform” and “I think my successes were generally due to being good at what I was asked to do” (responses provided on a 7 point Likert-type scale from 1 = “Not at all” to 7 = “Very much”). These items formed a reliable scale ($r = .88, p < .001$) and were averaged for further analyses, with higher scores representing greater attribution to ability. Attributions to gender discrimination do not make much sense when we are focusing on success, so we measured attribution of success to gender-based treatment (advantage) with two questions: “I think my successes were due to other people’s positive attitudes about my gender group” and “I think my successes were due to advantaged treatment I received because of my gender.” These items formed a reliable scale ($r = .92, p < .001$), so they were averaged

for further analyses. Higher scores correspond to stronger attributions to gender-based treatment.

Main cause of successes. I asked participants to pick the main cause of the successes they had recently experienced at work. Options were: Sufficient ability, good luck, positive attitudes towards ethnic group, positive attitudes towards socio-economic group, and positive attitudes towards gender group. I then asked participants to focus on a specific success they experienced recently and briefly describe what the success was. Then I asked participants to pick the main cause for this specific success, with the same options as above.

Emotions. Participants rated the extent to which they experienced 10 emotions that can be seen as related to experiences of threat or of challenge (adapted from Folkman & Lazarus, 1985). These ratings were repeated a few times during the experiment, referring to different events. Specifically, participants rated how they felt 1) about their setbacks; 2) about their successes; 3) about a specific setback that they perceived as due to lack of ability, and, finally, 4) about a setback that they perceived as due to gender discrimination. Threat-related emotions measured the extent to which participants felt anxious, threatened, calm, and relaxed. Factor analyses indicated that these items all are loaded on one factor. After recoding positive emotions, these items formed a reliable scale and were averaged for further analysis for setbacks, successes, setbacks due to lack of ability, and setback due to gender discrimination (respectively, $\alpha = .81$, $\alpha = .77$, $\alpha = .81$, $\alpha = .75$). Challenge-related emotions measured the extent to which participants felt discouraged, demotivated, confident, excited, proud, and happy. Factor analyses for threat indicated that there were two factors, discouraged and demotivated were loaded on the second factor with the value of .8, however, they still were loaded on the first factor with the value of .5, thus were remained in the scale. After recoding negative emotions, these items formed a reliable scale and were averaged for further analysis for

setbacks, successes, setbacks due to lack of ability, and setback due to gender discrimination (respectively, $\alpha = .80$, $\alpha = .84$, $\alpha = .77$, $\alpha = .81$).

Demographic Information. At the end of the survey, I asked participants to provide some demographic information, such as age, gender, nationality, and ethnicity. All these questions were open ended. Finally, participants indicated where they would place themselves on a socio-economic ladder, with people who are worst off at the bottom of the ladder and people who are better off at the top of the ladder on a 9-point ladder (1 as the bottom and 9 as the top).

7.1.2 Results

Demographics. Participants in this study were all female aged between 19 and 65 years ($M = 33.97$, $SD = 10.83$) and predominantly white/Caucasian (122, Asian= 7, African/black= 6, mixed race= 4, Latina= 2, and others= 8). The average on the social ladder was 5.29 ($SD = 1.71$). The highest percentage of participants (28%) chose 6 (out of 9) on the social ladder scale.

Manipulation of stability of ability. To test the effects of the manipulations on the manipulation check of stability of ability, I ran a 2 (Stable vs. Unstable ability) x 2 (Stable vs. Unstable discrimination) ANOVA. The results indicate significant effects of stability of ability on the ability manipulation checks, $F(1, 156) = 97.82$, $p < .001$, $\eta^2_p = .385$, showing that participants in the unstable condition ($M = 5.80$, $SD = .88$) reported that ability was significantly more unstable than participants in the stable ability condition ($M = 3.92$, $SD = 1.46$). In addition, stability of discrimination did not significantly affect this ability check, $F(1, 156) = 1.04$, $p = .310$, $\eta^2_p = .007$. The interaction between stability of ability and stability of discrimination was not significant either, $F(1, 156) = 2.86$, $p = .093$, $\eta^2_p = .018$.

Manipulation of stability of discrimination. A 2 (Stable vs. Unstable ability) x 2 (Stable vs. Unstable discrimination) ANOVA was conducted to test the effects of the manipulations

on the manipulation check for stability of discrimination. The results indicate only a significant main effect of stability of discrimination on this manipulation checks, $F(1, 155) = 63.8, p < .001$, $\eta^2_p = .292$, suggesting that participants in the unstable discrimination condition ($M = 5.42, SD = 1.12$) believed that gender discrimination less stable than participants in the stable discrimination condition ($M = 3.70, SD = 1.54$). The effects of stability of ability, $F(1, 55) = .30, p = .538, \eta^2_p = .002$, and the interaction, $F(1, 155) = .03, p = .857, \eta^2_p < .001$, were not significant.

Attributions

Attributions for setbacks. As mentioned earlier, in this study, in addition to attributions to lack of ability and to discrimination, different attributions were measured, such as luck, attributions to ethnicity and attributions to social class. Table 7.1 indicates the extent to which participants made attributions to different possible causes. It demonstrates that when encountering setbacks, in our sample, attributions to luck were ranked higher than attributions to lack of ability and to discrimination. That is, when facing negative outcomes, there were other alternative attributions that people might make, apart from ability and discrimination.

Table 7.1

Percentage of attributions to different causes

	Luck	Lack of ability	Gender discrimination	Social class	Ethnicity
Percentage	47%	36.57%	26.43%	22.29%	20.29%

Although participants were asked to indicate the extent to which various attributions were responsible for their setbacks, I was theoretically more interested in the extent to which the manipulated information affects attributions to ability relative to attributions to discrimination. For this reason, I first conducted a 2 (Stable vs. Unstable ability) x 2 (Stable

vs. Unstable discrimination) x 2 (Attributions to Lack of ability vs. to Gender bias) repeated measures MANOVA. The results showed only a significant effect of the within participants factor, type of attributions (attributions to lack of ability and to gender bias), $F(1,154) = 22.26$, $p < .001$, $\eta_p^2 = .126$. This result indicated that participants in all four conditions made significantly more attributions to lack of ability ($M= 2.56$, $SD= 1.48$) than to gender bias ($M= 1.58$, $SD= 1.34$). There were no significant between participant effects of stability of ability, $F(1, 154) = .01$, $p = .935$, $\eta_p^2 = .000$, stability of discrimination, $F(1, 154) = .12$, $p = .728$, $\eta_p^2 = .001$, or their interaction, $F(1, 154) = 0.69$, $p = .407$, $\eta_p^2 = .004$.

Although the interaction between the type of attribution and stability of discrimination was not significant, $F(1, 154) = 2.66$, $p = .105$, $\eta_p^2 = .017$, as can be seen in Figure 7.2, in line with Hypothesis 2, when gender discrimination was seen as stable, participants made significantly more attributions to lack of ability ($M= 2.41$ $SD= 1.53$) than to gender bias ($M= 1.95$ $SD= 1.50$), $t(157) = 2.18$, $p = .031$, 95% CI [.04, .88], $d = .30$. Similarly, when gender discrimination was seen as unstable, participants made more attributions to lack of ability ($M= 2.72$ $SD= 1.43$) than to gender bias, ($M= 1.76$ $SD= 1.90$), $t(157) = 4.50$, $p < .001$, 95% CI [.53, 1.37], $d = .57$. The interaction reflects the fact that this difference is larger in the unstable discrimination than in the stable discrimination condition,

This analysis revealed no other significant effects: The interaction between type of attributions and stability of ability, $F(1, 154) = .24$, $p = .626$, $\eta_p^2 = .002$, and the three way interaction between stability of ability, stability of discrimination and type of attributions were not significant, $F(1, 154) = 1.35$, $p = .248$, $\eta_p^2 = .009$.

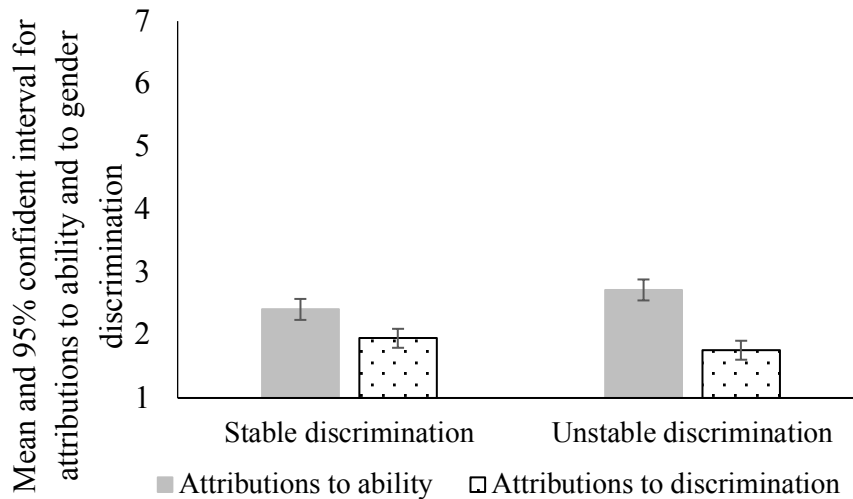


Figure 7.2. Comparing attributions across stability of discrimination conditions.

To probe this pattern more closely, I conducted two separate ANOVAs, one for each attribution. Looking at attributions of setbacks to gender bias alone in a 2 x 2 ANOVA test, I found no significant interaction between stability of ability and stability of discrimination, $F(1, 153) = 2.16, p = .144, \eta^2_p = .014$.

Table 7.2

Means and SDs for attributions to gender bias across conditions.

	Stable discrimination	Unstable discrimination
Stable ability	2.08 (1.70) #	1.58 (.98) §
Unstable ability	1.82 (1.23)	1.95 (1.35)

Note. Means with different symbol superscripts are different at $p < .10$.

However, in line with our prediction (Hypothesis 3b), the simple effect revealed that when ability is stable, participants make marginally more attributions to discrimination if it is stable than if it is unstable, $F(1, 154) = 2.77, p = .098, \eta^2_p = .018$. However, when ability is unstable, stability of discrimination does not have a significant effect on attributions to gender bias, $F(1, 154) = .18, p = .674, \eta^2_p = .001$ (see Table 7.2). This suggests, contrary to my predictions, that targets might be more motivated to make attributions to discrimination when

it is stable (and, thus, more likely, even if also more threatening), but only when ability is also believed to be stable. At the same time, the simple effect revealed no significant effects of stability of ability within any of the discrimination conditions. That is stability of ability did not affect attributions to gender bias when discrimination was stable, $F(1, 154) = .71, p = .401, \eta^2_p = .005$, or when discrimination was unstable, $F(1, 154) = 1.53, p = .218, \eta^2_p = .010$.

When attributions to ability were examined alone in a 2 x 2 ANOVA, there were no significant effects of stability of ability, $F(1, 155) = .11, p = .742, \eta^2_p = .001$, or stability of discrimination, $F(1, 155) = 1.56, p = .214, \eta^2_p = .010$. Also, the interaction was not significant, $F(1, 155) = .011, p = .917, \eta^2_p < .001$.

In sum, contrary to hypothesis, participants always made more attributions to lack of ability than to discrimination, although there was a weak tendency for participants to make more attributions to discrimination when it was stable, and ability was stable—i.e., when discrimination was more likely and attributions to lack of ability were unchangeable.

Attributions for success. A 2 (Stable vs. Unstable Ability) x 2 (Stable vs. Unstable Discrimination) x 2 (Attributions to Ability vs. to Positive attitudes towards participants' gender group) repeated measures MANOVA revealed a significant main effect of type of attributions for success, $F(1, 154) = 1139.26, p < .001, \eta^2_p = .881$. These results confirmed that participants made significantly more attributions to their sufficient ability ($M = 5.96, SD = 1.09$) for their success than positive treatment based on their gender group ($M = 1.58, SD = 1.20$). This was qualified by the significant interaction between type of attributions and stability of ability, $F(1, 154) = 6.94, p = .009, \eta^2_p = .043$, which simply shows that the effect of type of attribution is stronger when ability is stable than when it is unstable (see Table 7.3). Indeed, when ability was seen as stable, participants were more likely to attribute their success to sufficient ability than to gender-based treatment, $t(157) = 25.91, p < .001, 95\% \text{ CI } [4.36, 5.07]$,

$d= 5.07$. When ability was seen as unstable, participants also made more attributions to their sufficient ability than to gender-based treatment, $t(157) = 21.91, p < .001, 95\% \text{ CI } [3.67, 4.4]$, $d= 3.05$, but this effect was weaker. In addition, participants in the stable ability condition made more attributions to sufficient ability, $F(1, 154) = 3.98, p = .048, \eta^2_p = .025$, but this did not significantly vary when attributions to gender-based treatment made, $F(1, 154) = 3.23, p = .074, \eta^2_p = .021$.

Table 7.3

Means and SDs of interaction between type of attributions and stability of ability for attributions for success.

	Attributions to ability	Attributions to gender-based treatment
Stable ability	6.13 (.90) ^a	1.41 (.96) ^{b#}
Unstable ability	5.79 (1.24) ^c	1.76 (1.40) ^{b§}

Note. Means with different letter superscripts are different at $p < .05$ symbol superscripts are different at $p < .10$

Between subjects, there was also a significant main effect of stability of discrimination on type of attributions, $F(1, 154) = 6.12, p = .014, \eta^2_p = .038, M_{\text{stable}} = 3.93, SD = .88, M_{\text{unstable}} = 3.62, SD = .68$. This indicated that participants in the stable discrimination condition made significantly more attributions of any kind than those in the unstable condition.

This analysis revealed no other significant effects: between participant effect of stability of ability, $F(1, 154) < .001, p = .983, \eta^2_p < .001$, interaction between stability of ability and stability of discrimination, $F(1, 154) = .18, p = .669, \eta^2_p = .001$, interaction between attributions and stability of discrimination, $F(1, 154) = 1.21, p = .273, \eta^2_p = .008$, and three way interaction between attributions and independent variables, $F(1, 154) = .03, p = .873, \eta^2_p < .001$ were all non-significant.

I also compared attributions to lack of ability and to gender-based treatment across setbacks and success. For the full description and results see Appendix D.

Other attributions⁶

Setbacks. To examine the effects of the manipulated variables on attributing setbacks to luck, ethnicity, and socioeconomic class, I ran a 2 (stable vs. unstable ability) x 2 (stable vs. unstable discrimination) multivariate ANOVA. No significant results were found on attributions to setbacks, $ps > .098$.

Success. To examine the effects of manipulated variables on attributions of success to luck, ethnicity, and socioeconomic class, I ran a 2 (Stable vs. Unstable Ability) x 2 (Stable vs. Unstable Discrimination) multivariate ANOVA. This analysis revealed that stability of ability had a significant effect on attributing success to ethnicity, $F(1, 152) = 4.43, p = .037, \eta^2_p = .028$. This result indicated that when ability was seen as unstable ($M = 1.87, SD = 1.39$), participants made significantly more attributions to ethnicity for their success than when it was stable ($M = 1.46, SD = 1.03$). The effect of stability on attributions to socioeconomic class was not significant, $F(1, 152) = 3.18, p = .076, \eta^2_p = .021$.

In addition, this analysis indicated that stability of gender discrimination had an effect on attributions to ethnicity for success, $F(1, 152) = 4.24, p = .041, \eta^2_p = .027$. Specifically, when gender discrimination was seen as stable ($M = 1.87, SD = 1.45$) participants made more attributions to their ethnicity (which tended to be in the majority group, so this is an acknowledgement of advantage) than when discrimination was seen as unstable ($M = 1.46, SD = .93$). Stability of gender discrimination also had a significant effect on attributions to socio-economic class, $F(1, 152) = 4.02, p = .047, \eta^2_p = .026$. In particular, when gender discrimination was seen as stable ($M = 1.67, SD = 1.24$), participants made significantly more

⁶ There is a significant effect of the perceptions of how good one is at work on attributions for setbacks (irrespective of locus), $F(2, 151) = 11.45, p < .001, \eta^2_p = .132$, however, including these perceptions as a covariate in the analyses reported here does not change the results of effects of independent variables on attributions for setbacks. Including people's setback experiences as a covariate were not significantly associated with attributions to gender bias and to lack of ability for setbacks, $F(1, 151) = 2.18, p = .117, \eta^2_p = .028$.

attributions to their socio-economic class (which tended to be high) than when gender discrimination was seen as unstable ($M = 1.33$, $SD = .76$).

Emotions

Setbacks. To compare threat- and challenge-related emotions across all four conditions, I ran a 2 (Stable vs. Unstable Ability) x 2 (Stable vs. Unstable Discrimination) x 2 (Threat vs. Challenge emotions) repeated measures MANOVA. This revealed a significant main effect of type of emotions. In all four conditions, participants reported significantly more threat ($M = 4.31$, $SD = 1.4$) than challenge ($M = 2.63$, $SD = .99$), $F(1, 153) = 105.73$, $p < .001$, $\eta^2_p = .409$.

No other significant effects were found including main effect of stability of ability, $F(1, 153) = .13$, $p = .719$, $\eta^2_p = .001$, stability of discrimination, $F(1, 153) = .07$, $p = .786$, $\eta^2_p < .001$, interaction between stability of ability and stability of discrimination, $F(1, 153) = .03$, $p = .860$, $\eta^2_p < .001$, interaction between emotions and stability of ability, $F(1, 153) = .16$, $p = .686$, $\eta^2_p = .001$, and between emotions and stability of discrimination, $F(1, 153) = .04$, $p = .846$, $\eta^2_p < .001$. Furthermore, the three way interaction between emotions and independent variables was not statistically significant, $F(1, 153) = .11$, $p = .744$, $\eta^2_p = .001$.

Success. To compare threat- and challenge-related emotions across all four conditions, I ran a 2 (Stable vs. Unstable Ability) x 2 (Stable vs. Unstable Discrimination) x 2 (Threat vs. Challenge emotions) repeated measures ANOVA. This result indicated a significant main effect of type of emotion, $F(1, 152) = 680.91$, $p < .001$, $\eta^2_p = .818$. In all four conditions, participants reported significantly more challenge ($M = 6.06$, $SD = .91$) than threat ($M = 2.39$, $SD = 1.11$). This analysis revealed no significant main effect of stability of ability, $F(1, 152) = .29$, $p = .591$, $\eta^2_p = .002$, stability of discrimination, $F(1, 152) = 1.60$, $p = .208$, $\eta^2_p = .010$, interaction between stability of ability and of discrimination, $F(1, 152) = .33$, $p = .565$, $\eta^2_p = .002$, interactions between emotions and ability, $F(1, 152) = 1.05$, $p = .308$, $\eta^2_p = .007$, emotions

and stability of discrimination, $F(1, 152) = .31, p = .577, \eta^2_p = .002$, or three way interaction, $F(1, 152) = .47, p = .582, \eta^2_p = .002$.

Emotions for setbacks caused by lack of ability. To compare threat and challenge emotions for setbacks caused by lack of ability across all four conditions, I ran a 2 x 2 x 2 repeated measures MANOVA. The results showed a significant main effect of type of emotions, $F(1, 62) = 139.16, p < .001, \eta^2_p = .692$. More specifically, in all four conditions, participants reported more threat ($M= 5.20, SD= 1.36$) than challenge ($M= 2.19, SD= .94$) in response to setbacks caused by lack of ability. This analysis revealed no main effect of stability of ability, $F(1, 62) = .08, p = .775, \eta^2_p = .001$, no significant main effect of stability of discrimination on emotions for setbacks caused by lack of ability, $F(1, 62) = 3.05, p = .086, \eta^2_p = .047$, and no other significant effects: Interaction between stability of discrimination and stability of ability, $F(1, 62) = 1.32, p = .255, \eta^2_p = .021$, interactions between emotions and ability, $F(1, 62) = .96, p = .331, \eta^2_p = .015$, emotions and stability of discrimination, $F(1, 62) = .46, p = .502, \eta^2_p = .007$, or three way interaction, $F(1, 62) = .31, p = .579, \eta^2_p = .005$.

Emotions for setbacks caused by gender bias. A 2 x 2 x 2 repeated measures MANOVA with emotions indicated a main significant main effect of type of emotion for setback caused by gender discrimination: Participants in all four condition reported significantly more threat ($M= 5.01, SD= 1.30$) than challenge ($M= 2.61, SD= 1.11$), $F(1, 25) = 40.05, p < .001, \eta^2_p = .616$. This was not qualified by a significant interaction between emotions and stability of discrimination, $F(1, 25) = 4.41, p = .046, \eta^2_p = .150$. Participants in the stable discrimination condition reported significantly more threat ($M= 4.69, SD= 1.28$) than challenge ($M= 3.07, SD= 1.22$), $t(28) = 3.15, p = .004, 95\% \text{ CI } [.58, 2.77], d= 1.30$. Participants in the unstable condition also reported more threat ($M= 5.40, SD= 1.26$) than challenge ($M= 2.05, SD= .64$), $t(28) = 5.68, p < .001, 95\% \text{ CI } [2.13, 4.55], d= 3.35$, but this difference was larger in the unstable gender discrimination condition than in the stable discrimination condition.

Interestingly, participants in the stable condition ($M= 3.07$, $SD= 1.22$) reported significantly more challenge than those in the unstable condition ($M= 2.05$, $SD= .64$), $F(1, 25) = 6.79$, $p= .015$, $\eta^2_p = .214$. However, there was no significant difference in reported threat across stability conditions, $F(1, 25) = 2.03$, $p= .167$, $\eta^2_p = .075$ (see Figure 7.3).

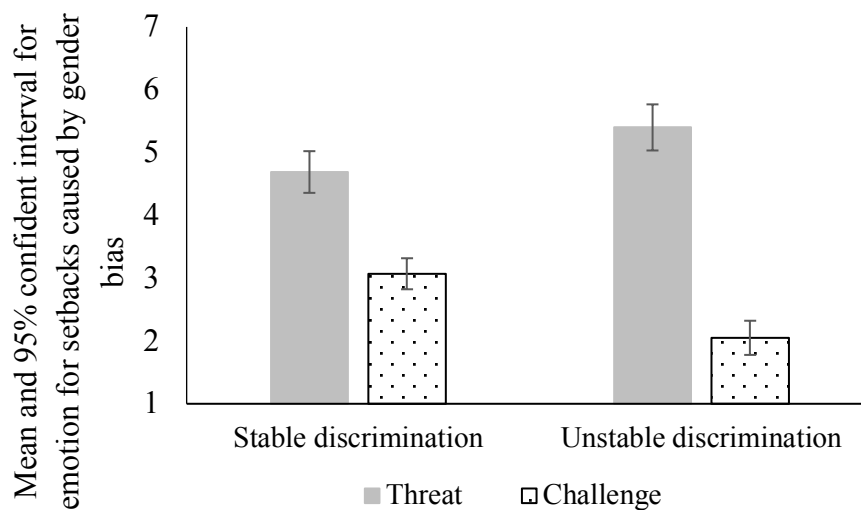


Figure 7.3. Emotions in response to a setback due to gender discrimination as a function of stability of discrimination.

Does stability affect the association between attributions and threat?

I also ran some exploratory analyses to examine the extent to which stability of attributions can affect individuals is by modifying the relationship between the attribution and emotions. To examine this, I first inspected correlations between attributions and emotions across conditions and then conducted moderation analyses using PROCESS.

Correlations between attributions for setbacks and emotions across conditions.

Table 7.4 displays the inter-correlations between emotions and attributions. Attributions to ability were positively and significantly linked to threat when ability was stable ($r = .35$, $p = .002$). This positive link is somewhat stronger when gender discrimination is unstable ($r = .40$, $p = .011$) than when discrimination it is stable ($r = .31$, $p = .052$). However, when ability was

stable and gender discrimination was unstable, threat was significantly and positively associated with attributions to bias ($r = .49, p = .002$). That is, although the more participants in the stable ability and unstable discrimination condition attributed setback to lack of ability the more they reported threat, attributions to bias in this condition were linked to threat at least as, if not more, strongly than attributions to lack of ability.

Regarding challenge, there was no significant association between attributions for setbacks and challenge when ability was stable, and discrimination was unstable (attributions to lack of ability, $r = -.27, p = .091$; attributions to bias, $r = -.29, p = .068$). To examine the effects of the manipulations on these associations more precisely, I ran moderation analyses which are reported below.

Table 7.4

Correlations between emotions and attributions

	Stable ability								Unstable ability							
	Stable discrimination				Unstable discrimination				Stable discrimination				Unstable discrimination			
	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
1. Attributions to ability	-.04	.31†	.02	-	-.27†	.40*	.30†	-	-.04	.19	.10	-	-.03	-.01	.14	-
2. Attributions to bias	.15	-.03	-		-.29†	.49**	-		-.15	.23	-		.18	.05	-	
3. Threat	-.37*	-			-.50**	-			-.51**	-			-.24	-		
4. Challenge	-				-				-				-			

† < .091. ** $p < .005$. * $p < .05$

7.1.2.1 Moderation analyses

Does stability of ability moderate the relationship between attributions of setbacks to ability and self-reported threat? The moderation analysis were conducted via PROCESS Model 1 (Moderation analysis; Hayes, 2013). Stability of ability was entered as dichotomous moderator and attributions to ability were entered as a continuous predictor. Additionally, self-reported threat (experienced in response to setbacks) was the outcome. The direct effect of attributions to ability on threat was significant, $b = .57$, $t(154) = 2.51$, $p = .013$ with a 95% BC (bias-corrected; see Efron, 1987) CI of .12 and 1.02, showing that making attributions to ability is positively related to threat. Although the interaction between stability of ability and attributions to ability on threat was not significant, $b = -.24$, $t(154) = -1.62$, $p = .107$, with 95% BC bootstrap CI of $-.53$ and $.05$, when ability was seen as stable, there was a significant and positive effect of attributions to ability on self-reported threat, $b = .33$, $t(154) = 3.31$, $p = .001$, with a 95% BC CI of $.13$ and $.53$, but this effect was not significant when ability was seen as unstable, $b = .09$, $t(154) = 0.84$, $p = .399$, CI of $-.12$ and $.31$. This indicates that only when ability is seen as stable, making more attributions to lack of ability was threatening to participants. However, attributing setbacks to unstable ability was not related to threat. This analysis revealed no significant direct relationship between stability of ability and the self-reported threat, $b = .61$, $t(154) = 1.41$, $p = .161$ with a 95% BC CI of $-.25$ and 1.47 .

Does stability of discrimination moderate the relationship between attributions of setbacks to bias and self-reported threat? The moderation analyses were conducted via PROCESS Model 1 (Hayes, 2013). Attributions to gender discrimination were entered as predictor, stability of discrimination as moderator and threat emotions as the outcome. This analysis showed no significant main effect of attributions to discrimination on threat, $b = -.12$, $t(156) = -.47$, $p = .640$ with a 95% BC bootstrap confidence interval (CI) of $-.60$ and $.37$, no main effect of stability of discrimination, $b = -.24$, $t(156) = -.63$, $p = .530$ with a 95% BC CI of

-.98 and .51, and no significant interaction between stability of discrimination and attributions to discrimination on threat, $b = .20$, $t(156) = 1.17$, $p = .25$ with a 95% BC CI of -.14 and .53. However, exploring the effects of the predictor at the levels of the moderator showed that when discrimination was seen as unstable, there was a significant and positive relationship between attributions to gender bias and self-reported threat $b = .28$, $t(156) = 2.11$, $p = .037$ with a 95% BC CI of .02 and .53. However, when discrimination was seen as stable, there was no significant relationship between attributions to gender bias and self-reported threat, $b = .08$, $t(156) = 0.76$, $p = .446$, CI of -.13 and .29.

Do stability of discrimination and of ability moderate the relationship between attributions of setbacks to ability and self-reported threat? To examine the moderation effect of both manipulated independent variables on the relationship between attributions of setbacks to ability and threat, I ran a moderation analysis which was conducted via PROCESS Model 3 (Hayes, 2013). To do so, attributions to ability were entered as a continuous predictor. Stability of ability and stability of discrimination were entered as dichotomous moderators, and threat was entered as outcome (see Figure 7.4). I coded stability of ability, such that 1 indicated stable ability and 2 indicated unstable ability. Stability of discrimination was coded as 1 stable and 2 unstable gender discrimination. This analysis revealed no significant main effect of attributions to lack of ability, $b = -.25$, $t(157) = -.36$, $p = .723$ with a 95% BC bootstrap CI of -1.66 and 1.15, main effect of stability of ability, $b = -1.18$, $t(157) = -.87$, $p = .384$ with a 95% BC bootstrap CI of -3.85 and 1.49, main effect of stability of discrimination, $b = -1.87$, $t(157) = -1.34$, $p = .182$ with a 95% BC bootstrap CI of -4.63 and .89, interaction between attributions to lack of ability and stability of ability, $b = -.25$, $t(157) = 0.69$, $p = .489$ with a 95% BC bootstrap CI of -.60 and 1.26, interaction between attributions to lack of ability and stability of discrimination, $b = .58$, $t(157) = 1.23$, $p = .220$ with a 95% BC bootstrap CI of -.35 and 1.50, interaction between stability of ability and stability of discrimination, $b = 1.25$, $t(157) = 1.40$,

$p = .163$ with a 95% BC bootstrap CI of $-.51$ and 3.00 , and three way interaction between attributions to lack of ability, stability of ability, and stability of discrimination, $b = -.39$, $t(157) = -1.29$, $p = .199$ with a 95% BC bootstrap CI of $-.98$ and $.21$.

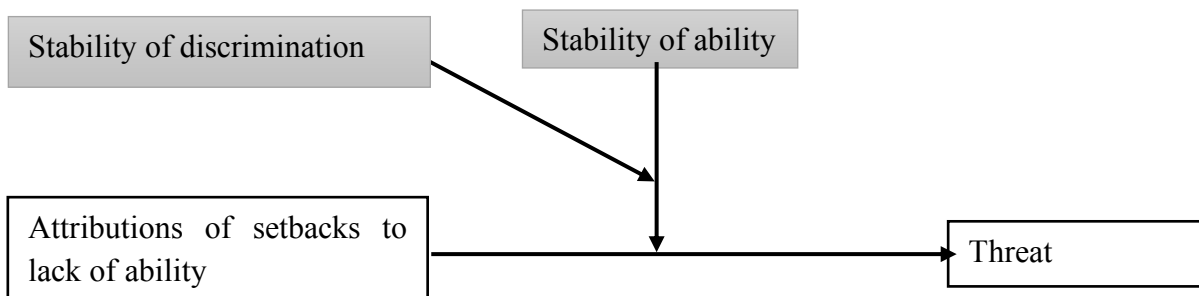


Figure 7.4. Moderation model predicting effects of stability of discrimination and stability of ability on the relationship between attributions to lack of ability reported threat.

Do stability of discrimination and of ability moderate the relationship between attributions of setbacks to discrimination and self-reported threat? To examine the moderation effect of both manipulated independent variables on the relationship between attributions of setbacks to bias and threat, I ran a moderation analysis which was conducted via PROCESS Model 3 (see Figure 7.5; Hayes, 2013). To do so, attributions to bias were entered as a continuous predictor. Stability of ability and stability of discrimination were entered as dichotomous moderators, and threat was entered as the outcome. This analysis indicated a negative significant effect of attributions to discrimination on threat, $b = -2.06$, $t(156) = -2.64$, $p = .009$ with a 95% BC bootstrap CI of -3.60 and $-.52$, a negative significant effect of stability of ability, $b = -2.34$, $t(156) = -1.99$, $p = .049$ with a 95% BC bootstrap CI of -4.66 and $-.01$, and negative significant effect of stability of discrimination, $b = -2.84$, $t(156) = -2.37$, $p = .019$ with a 95% BC bootstrap CI of -5.20 and $-.48$. In addition, this analysis revealed significant interactions between moderators and attributions to discrimination (see Table 7.5).

Table 7.5

Interactions between variables in the moderation analysis

	<i>b</i>	<i>t</i>	<i>p</i>	95% CI	
Attributions to discrimination X stability of ability	1.28	2.48	.014	.26	3.30
Attributions to discrimination X Stability of discrimination	1.74	3.08	.002	.63	2.85
Stability of ability X Stability of discrimination	1.69	2.22	.028	.19	3.20
Attributions to discrimination X stability of ability X stability of discrimination	-.99	-2.81	.006	-1.68	-.29

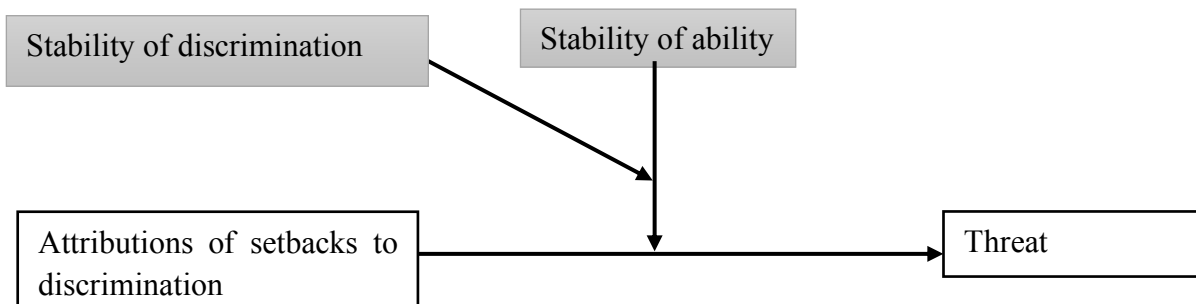


Figure 7.5. Moderation model predicting effects of stability of discrimination and stability of ability on the relationship between attributions to discrimination reported threat.

Looking at the effects of the predictor at the levels of the moderators reveals that when discrimination was unstable and ability was stable, the relationship between attributions to discrimination and threat was positive and significant, $b = .73$, $t(149) = 3.31$, $p = .001$ with a 95% BC bootstrap CI of .29 and .1.17. In other words, when ability was stable but discrimination was unstable, the more participants made attributions to gender discrimination, the more threat they perceived. . No other slopes were significant: When both discrimination and ability were stable, $b = -.03$, $t(156) = -.18$, $p = .857$ with a 95% BC bootstrap CI of $-.28$ and .23, when discrimination was stable but ability was unstable, $b = .27$, $t(156) = 1.54$, $p = .13$

with a 95% BC bootstrap CI of $-.08$ and $.63$, and when both discrimination and ability were unstable, $b = -.05$, $t(156) = .27$, $p = .788$ with a 95% BC bootstrap CI of $-.28$ and $.36$.

7.2 Discussion

Although there have been inferences in the literature about whether members of stigmatised groups prefer to make attributions of a negative outcome to discrimination rather than to lack of ability, or vice-versa, to my knowledge this has not yet been directly examined. In this study, I examined whether attributional stability affects the extent to which individuals make any of these attributions. Considering that stability of attributions plays a role in the extent to which attributions to discrimination and to lack of ability are perceived as a threat (see previous chapters of this thesis and Dweck & Leggett, 1988; Schmitt et al., 2003), this study examined what attributions people make when faced with information about the stability of both ability and discrimination and what implications this has for self-reported threat and challenge.

Overall, based on the results of previous studies, I expected that because stable discrimination is seen as more threatening than unstable discrimination, participants would make less attributions to discrimination when it is perceived as stable—and, potentially, instead make more attributions to ability in this condition. In addition, I previously found that unstable ability is perceived as more threatening than stable ability. As a consequence, I expected people to make less attributions to ability when it is perceived as unstable than when it is perceived as stable—in which case they might, instead, make more alternative attributions, such as attributions to discrimination. This, however, would contradict prior research, so I also left open the possibility that people might prefer to make more attributions to lack of ability when it is perceived as unstable.

However, none of these predictions were supported in this study. Instead, I found that the extent to which participants made each of these attributions was unaffected by the manipulations. Instead, participants consistently attributed their setbacks at work more to lack of ability than to discrimination. However, a weak tendency suggested an interesting, although surprising, possibility, i.e., that participants might prefer to attribute setbacks to discrimination when both discrimination and ability are believed to be stable. This was the case despite the finding that when asked about their emotional responses to a specific setback caused by discrimination, participants reported more threat than challenge, especially when discrimination was stable. That is, participants report feeling more threatened by stable discrimination, but they still make more attributions to discrimination in this condition, as long as ability is also stable. I speculate that this might happen because participants recognise that when discrimination is stable, it is also more likely to explain their negative outcomes than when it is unstable—particularly given that our conceptualization of stability of discrimination also implied pervasiveness across contexts, as in prior research (and as logical, given that if stable then it can only be pervasive, since it was pervasive in the past). This, in itself, might, however, not be enough to increase attributions to discrimination, unless it is added to information about the stability of ability. As such, individuals are more likely to endorse attributions to discrimination when it is believed to be stable and they are threatened by a belief in stable ability. This is not what I expected, especially because in our prior studies I found that participants were more threatened by unstable than by stable ability. However, that stable ability is more threatening than unstable ability is consistent with prior research and this combination between threatening (stable) ability and likely (stable) discrimination is certainly one to investigate further in future work.

These findings suggest, in sum, that people may, in fact, prefer to make attributions to lack of ability than to discrimination, possibly due to the strong societal domination of beliefs

in meritocracy (see Foster & Tsarfati, 2005; Major, Kaiser, O'Brien, & McCoy, 2007), although the extent to which they make attributions to bias varies according to how likely it is. This diverges from what was originally proposed by Crocker and Major (1989) but is consistent with other evidence showing that members of socially stigmatized groups only make attributions to discrimination when there are cues that it might have taken place—not when it is highly unlikely (Stroebe, Ellemers, Barreto, & Mummendey, 2009).

A different way in which the role of attributional stability can be examined is by testing whether it moderates the relationship between attributions and reported threat. I found that, even though the interaction was not significant, the relationship between attributions to lack of ability and threat was only significant (and positive) when ability was believed to be stable. This is in fact consistent with prior research. However, this was not the same for the relationship between attributions to discrimination and threat. Here, I found that the relationship is only significant (and positive) when discrimination is unstable, and ability is stable. That is, participants reported being more threatened by attributions to discrimination when they believed that discrimination was unstable (and perhaps, therefore, they were one of the few people who encountered it) and their ability was a threatening alternative cause for their negative outcome.

In line with Schmitt and Branscombe (2002), the results of Study 3 of this PhD suggested that stability of discrimination is likely to increase perceived threat. Nevertheless, the results of this Study 4 suggest that perceived stability can mean that discrimination is more probable, which may affect the likelihood of using attributions to bias beyond considerations of associated threat. The results also suggest that there may be a conceptual difference between applying the notion of stability to ability and to discrimination. For example, stability of discrimination increases the likelihood that one may encounter prejudice (and, therefore, that prejudice is a relevant explanation for one's failure). However, stability of ability is not likely

to affect perceived relevance of this cause for a current failure, since stability of ability is not related to the likelihood that ability might be the cause of a current outcome – instead, it refers to the likelihood that ability can be improved in the future or not. This suggests that the notions of stability of ability and discrimination are not conceptually identical, and, consequently, the effects of perceived stability may not be symmetrical across these two dimensions.

In sum, my results suggest that stability of ability seems to modify how threatening attributions to ability are, but this does not modify the extent to which people make attributions to lack of ability. By contrast, stability of discrimination affects threat directly (as demonstrated by moderation analyses, attributions to discrimination are more associated with threat when discrimination is perceived as stable), but its effect on attributions, or on how threatening these, are is more closely linked to heuristics about how likely it is that discrimination took place or that one was an isolated target of discrimination.

Although the results of this study are interesting, there were some limitations that need to be addressed. The most important limitation of this study is that, though I recognise that attributions to ability and discrimination are not the only possible attributions one can make when receiving a negative outcome, my focus on the dominant debate surrounding these two attributions meant that I did not explore alternative attributions in sufficient depth. So, while we can make inferences about the effects of the manipulation of attributional stability on the attribution that it directly refers to, when talking about ‘alternative attributions’ we are on less safe ground because we can only satisfactorily analyse one alternative attribution. Future research should examine this in a more complete way to improve our understanding of the attributions that are made when ability/discrimination are most threatening.

In addition, in this study, I did not control for the content/type of participants’ setbacks. That is, participants were asked to think about their recent setbacks, however, the specific

events considered by participants varied between participants. That is, for some participants, maybe the cause of setback was evident, whereas, for others the cause of their setback could be more ambiguous, which is a factor already known to modify attributions and their effects (Crocker & Major 1989). Besides, although in this study the main focus was on attributions to gender discrimination, other types of discrimination-related attributions such as socio-economic class and ethnicity were measured, which could be threatening to participants' identity too. Unfortunately, I did not measure ethnicity or social class, so I could not take into account the self-relevance of these attributions, or the extent to which they might have been relevant when the setback occurred.

Another issue to consider is that even though I tried to keep the manipulation of stability of discrimination and ability as close as possible, it might be possible to make them even more symmetrical, so that they have more similar effects. As already argued, it is however possible that stability simply means different things for ability and for discrimination, so this symmetry might not be relevant at all. Nevertheless, future research could delve more deeply into this.

It is also important to acknowledge that my focus in this study was primarily on attributions, which meant that I made no effort to assess threat and challenge emotions in an unobtrusive way. This might mean that I did not quite capture actual feelings of threat and challenging in this study and results involving these measures must be taken with caution.

Despite these limitations, this study was the first, to my knowledge, to examine how information about the stability of two different types of attributions can, combined, affect the attributions people make and how these affect threat/challenge experiences. In the next chapter, I will bring all my findings together to explain how this thesis contributes to the literature.

8 General Discussion

The research reported in this thesis aimed to address a gap I identified in the literature that is linked to one of the most central debates in stigma research. This debate pertains to when and why people make attributions to discrimination, what the underlying motivations might be, and what role these play in the attributions that members of stigmatized groups make for negative outcomes. I have drawn on attribution theory, including research on the role of attributional stability; on theory and research on attributions to discrimination and the impact of discrimination on targets, including emotional and physiological responses; and on theory and research on implicit theories of ability. My goal was to investigate the extent to which attributional stability affects the threat and challenge that individuals perceive and experience and how this influences the extent to which attributions to discrimination and to lack of ability are made. In this research, I have used different methods for measuring threat and challenge, namely self-reported measures and cardiovascular indicators (CV) drawn from the biopsychosocial model of threat and challenge. In general, the results of this research suggest that attributional stability has an effect on the extent to which attributions to discrimination and to ability are perceived as a threat/challenge. However, I have not found clear evidence that this influences which attributions are made. Although details of the results are discussed in each chapter, below I briefly summarise the results of all studies reported in this thesis.

8.1 Summary of Findings

The first goal of the research reported in this dissertation was tested in Study 1. This study specifically aimed to understand people's lay theories about characteristics of attributions and, even more specifically, the extent to which attributions to discrimination and to lack of ability are seen as stable vs. unstable. The results of this study revealed that attributions to discrimination or to lack of ability were perceived different in other ways, but as equally stable.

That is, contrary to what some previous research suggested (Crocker & Major, 1989; Sechrist, Swim, & Stangor, 2004) attributions to discrimination are not necessarily less stable than attributions to lack of ability. Indeed, this is consistent with other research highlighting that attributions to discrimination and to lack of ability can be perceived as stable or as unstable and these perceptions can vary across contexts and be manipulated (Schmitt & Branscombe, 2002; Schmitt, Branscombe, Postmes, 2003; Dweck & Leggett, 1988).

Building on the results of Study 1, the second goal of this thesis was to investigate whether attributional stability influences the extent to which attributions to discrimination and to lack of ability are perceived as a threat/challenge when members of stigmatised groups receive a negative outcome. This was tested in two ways. First, in two separate studies presented in Chapter 5, I manipulated stability/pervasiveness of attributions to discrimination (study 2a) and to lack of ability (2b). In line with previous research, the results of self-reported data suggest that attributions to discrimination are experienced as more threatening when discrimination is perceived to be pervasive, whereas, when discrimination is perceived to be rare, attributions to discrimination were experienced as more challenging. Although the relationship between attributions to lack of ability and threat was not the focus of this study, in line with our theoretical model, the results indicated that, in the stable/pervasive discrimination condition participants made more attributions to lack of ability—which was the alternative attribution measured in this study. This supports the idea that when attributions to discrimination are threatening, people might be less likely to attribute their outcomes to discrimination and more likely to make an alternative attributions. CV responses, however, indicated very different experiences, in the opposite direction of what I hypothesised and of what was found in the self-reported measures. Specifically, the manipulation of attributional stability did not have any significant effect on physiological experiences. In addition, and although no significant effects were found, CV responses were suggestive of higher challenge

in the stable/pervasive discrimination condition relative to the baseline, contrary to expectations. There was also some evidence indicative of challenge in the rare discrimination condition relative to the baseline.

The results of Study 2b were also surprising. Specifically, contrary to my hypothesis, the results of Study 2b revealed that participants in the unstable/malleable ability condition reported more threat than challenge and than participants in the stable/fixed ability condition. CV responses were unaffected by the manipulation in this study. Although this was not directly examined in prior research, prior research led me to expect greater experiences of threat when ability is seen as fixed. Indeed, prior research showed that when ability is seen as unstable/malleable (i.e., it can be improved through increased effort or change in learning approach) making attributions to lack of ability has a less negative impact than when ability is seen as stable/fixed (Dweck & Leggett, 1988; Hong, Chiu, Dweck, Lin & Wan, 1999). This and other similar findings led me to infer that attributions to lack of ability would be most threatening when ability is perceived as fixed, compared to when it is perceived as malleable. Of course that these results must be taken with care, as they require replication with a larger sample, but they do raise the interesting possibility that attributing negative outcomes to malleable ability, which suggests that there is a possibility of improvement in the future, is not necessarily unthreatening. Unstable/malleable ability and future improvement might imply that one is responsible for making the necessary changes to work harder in the future. This could be seen as a threat.

Study 3 aimed to examine these processes with a much larger sample, as well as to directly compare the two types of attributions. When the effects of attributional stability were directly compared in this study, the results indicated no effects of stability on reported threat and challenge. Specifically, regardless of attributional stability, participants reported more threat when the rejection was attributed to lack of ability than when it was attributed to

discrimination, where participants reported more challenge. The cardiovascular responses, however, indicated different results, this time showing significant effects of the manipulations. Specifically, when rejection was attributed to stable/pervasive discrimination, CV responses were in line with higher threat, compared to when attributions were made to unstable/rare discrimination, or to lack of ability. That is, this study showed that attributions to unstable/rare discrimination were particularly threatening to our participants. However, stability did not have any significant effect on CV markers of motivational states of threat and challenge across participants in the ability condition.

In Study 4, I went beyond the emotional and physiological effects of attributions to examine whether attributional stability affects the extent to which members of stigmatized groups make attributions to discrimination or to lack of ability. I specifically predicted that individuals are less likely to make attributions to discrimination when these discrimination (and therefore attributions to discrimination) are seen as stable/pervasive. In a similar vein, I had originally expected that individuals would be less willing to make attributions to lack of ability when it is stable/fixed, my findings in the earlier studies led me to revise this prediction. Specifically, I expected individuals to make fewer attributions to lack of ability when they perceived ability as unstable/malleable. Although this latter prediction was based on the results from my previous studies, it was contradictory to what I initially predicted and also opposite to what the literature suggests. As such, I kept this somewhat exploratory so as to also allow for the possibility that people might be more likely to make attributions to discrimination when it is unstable, as my earlier findings suggest, but also when it is stable, as prior research suggested. The results, however, did not support my predictions. Instead I found that regardless of information about the stability of attributions, female participants made more attributions to their lack of ability than to gender discrimination, when they thought about setbacks experienced at work.

8.2 Conceptualization of Stability

One of the important highlights of this research is that conceptualization of stability has developed through my work. My original goal in this research was to examine how stability might play a role in shaping the consequences of attributions, but this analysis emerged more specifically from a consideration of the work by Schmitt and Branscombe (2002; Branscombe, Schmitt, & Harvey, 1999; Schmitt, Branscombe, & Postmes, 2003). These authors proposed that attributional stability needed to be considered when examining the effects of attributions to discrimination and used the concept of pervasiveness of discrimination to specify this. This concept referred to stability across time, but this has clear implications for how it varies across context—whether or not discrimination has decreased across time and (therefore) whether or not it is often encountered across context. It makes a lot of sense that in this case, time and context are not separable. I then saw a parallel in attributions to ability, which can also be stable or unstable. The best model I found to conceptualize this was Dweck's work on implicit theories of ability. Here, stability refers to the belief in the fixed or malleable nature of ability, usually referring to whether ability can be improved or not. The core idea is that negative outcomes are not necessarily stable if you believe you can improve, so ability is stable or unstable across time. Though one can also conceive of malleability across context, since people can have a better or worse outcome in different tasks, the conceptual focus in this area and in the operationalisations used is very much in change across time. To follow these conceptualizations, in study 2a I manipulated pervasiveness of discrimination in which I focused on both time and context – whether or not other 19 interviewers are sexist and whether or not one should expect a similar behaviour in the future. In study 2b I manipulated stability of ability following the concept of stability of ability in Dweck's work. Here, I specifically highlighted that ability can or cannot improve across time. The results of these studies indicated that stability of discrimination and of lack of ability differ in various ways. While pervasiveness

of discrimination refers to whether or not encountering discrimination can change for members of stigmatised groups across time and context, stability of ability refers to whether or not one can improve their ability, only across time. Following these results and since one of the goals of study 3 was to directly compare both attributions together, I attempted to focus on the time aspect only in order to minimize the difference between stability of discrimination and ability. The results of this study suggested that even when focusing on time, stability of discrimination and lack of ability have different implications, specifically for controllability and predictability. This difference is derived partly from the difference in the loci of attributions – i.e., attributions to lack of ability are seen as internal, while attributions to discrimination are partly internal and partly external. This, in turn, has consequences for perceived responsibility. For example, malleable ability refers to whether one can improve their ability and as a result, is responsible for negative outcomes, whereas, malleable discrimination refers to the extent to which discrimination is likely to happen which has less implications for personal responsibility. This is important when studying stability of attributions – that stability has various dimensions (e.g., time and context) and each dimension can have different implications and directions, for example, it can get better or worse. Conceptually, all dimensions are relevant; empirically, though, care must be taken when comparing.

8.3 Contributions and Implications of my Work

The presented research contributes to existing knowledge in a variety of ways. In contrast to what previous research suggested (Crocker & Major, 1989; Sechrist et al., 2004), when there is no information about attributional stability, it is unwise to assume that one attribution is necessarily perceived as more or less stable than another. In line with previous research, my research indicated that people's lay theories about the stability of specific attributions can be influenced (Dweck & Leggett, 1988; Dweck, Hong, & Chiu, 1993; Schmitt et al., 2003; Stroebe, Dovidio, Barreto, Ellemers, & John, 2011). It is important that this is

taken into account when studying the attributions people make, and their effects, and to avoid making assumptions about how attributions are perceived when there is no additional information guiding these perceptions.

It is important to note that attributions to discrimination and to lack of ability are not the only possible attributions people make. In this thesis, I focused primarily on these two attributions because the central debate to which my thesis aims to contribute highlights these two attributions. I did measure other attributions in some studies, but I did not manipulate stability in relation to them, nor did I measure them in sufficient detail to be able to incorporate them fully in my analyses. However, it is crucial to recognise that I am not proposing a fully hydraulic model in which people would necessarily make attributions to discrimination, when avoiding (or in order to avoid) making attributions to lack of ability—or vice versa. Although this hydraulic model is often implied in this area of research, and my research and data do speak to it, it is important to stress that when people receive a negative outcome, in an ambiguous situation, there are a variety of attributions available to which are potentially more or less threatening than the two core attributions studied in this thesis. For example, one might make attributions to causes such as being ill during a job interview/exam, or to purely external causes, such as testing conditions. These potential causes are not necessarily stable as, for instance one can be ill one time, but recover for the next task, or testing conditions can be better one time and worse at another time. Although it is difficult to capture all of these causes in experimental studies, in Study 4 (presented in Chapter 7), I measured a few other possible attributions for a negative outcome, such as (lack of) luck. The results of this study indicated that attribution to luck were preferred over attributions to discrimination and to lack of ability. Luck tends to be perceived as external, unstable, and uncontrollable, although this is too open to subjective opinion, as people can also believe that they ‘control’ or ‘make’ their luck. Importantly, also, for some people claiming ‘bad luck’ might be less problematic than

attributing a negative outcome to discrimination or lack of ability. My findings show that when people are given the chance to make this attribution, they can prefer to do, potentially because, overall, it might be less threatening to them. Going forward, researchers in this area would benefit from appreciating that people attribute negative outcomes to many causes other than discrimination and ability and should ensure to measure these as well when examining what attributions people make, or their effects.

Even when it is highly likely to be the cause of their negative outcomes, people may still avoid making attributions to discrimination. In contrast to what previous research suggested (Crocker & Major, 1989; Major, Kaiser, & McCoy, 2003; Sechrist et al., 2004), our findings stress that attributions to discrimination are not always made to the same extent, or even preferred over others. There could be several reasons for that, such as dominant beliefs in a just world, or whether or not there are cues available that are suggestive of discrimination against one's social group (see Chapter 7 for a more complete discussion). My research contributes to the existing literature by highlighting that although stability/pervasiveness of discrimination might suggest that discrimination is likely in itself this might not necessarily lead people to make this attribution, unless alternative attributions are highly threatening.

Furthermore, the results of this research contribute to the existing literature by suggesting that stability can gain different meanings when it refers to discrimination and when it refers to lack of ability. When discrimination is perceived to be stable/pervasive, this means that the likelihood that one encounters discrimination is high. That is, discriminatory treatment is highly plausible across context and time. For example, the likelihood that all of 20 interviewers in a job interview are prejudiced is higher when discrimination is stable/pervasive. However, unstable/rare discrimination decreases the probability of encountering discrimination, although it is still possible. For instance, in the job interview example, maybe one out of the 20 interviewers is prejudiced which reduces the probability of encountering

discrimination compare to when all interviewers are prejudiced. So pervasive discrimination is more threatening, but also more likely, so even though individuals might be motivated to avoid the threat implied, they are also more certain that discrimination is the cause of their negative outcomes. All in all, this indicates that, contrary to my initial argument, even though attributions to stable/pervasive discrimination are more threatening, they are not necessarily avoided, quite the opposite.

Stability of ability has, however, a rather different meaning. Stability of ability refers to whether or not one's ability can change. Although there is no direct implication that one is responsible to make those changes (for example, one might argue, in some situations, that a teacher is responsible for changing their teaching strategy to improve student learning), when ability is seen as malleable and one received a negative outcome one is more likely to feel that one needs to take steps to make the necessary change. This implies that the concept of stability of discrimination and of ability are not identical, or parallel, which might result in different consequences. This contributes to our understanding of attributions and their consequences and has implications to the comparison between attributions to discrimination and to ability that is often made in the literature. In a way, this is another reason why making such a comparison is unlikely to be very helpful, a more productive focus instead being the identification of factors that might affect the extent to which each attribution is made (see also Barreto, 2015).

The fact that I used both self-reported and physiological indicators of threat and challenge, and collected what is probably the largest sample ever with both self-reported and cardiovascular data (Study 3), also contributes to the literature by highlighting how attributional stability affects individuals at different levels. Although self-reported data provides very valuable insights into what people want to express about their feelings, an unobtrusive measure, such as CV responses, can reveal important additional information regarding threat and challenge motivational states—information participants might not be

aware of, or might prefer not to report. These CV markers of motivational states of threat and challenge do not have to be conscious, however, they still can be measured through physiological data. Combining self-reported data with cardiovascular responses provides, therefore, a clearer and more complete understanding of participants' states. In this context it is also interesting to reflect on the fact that our participants found the word "challenge" confusing, as it can be perceived as a negative emotion or as a positive one. As such, when reporting on their emotions, participants had to deal with subjective (and sometimes ambiguous) meanings attributed to the words used to describe emotional states, whereas cardiovascular markers provide two distinguishable patterns for threat and challenge, which can help to understand participants' emotional states. Altogether, this research contributes to the literature not only by providing direct examination of effects of attributional stability on reported threat and challenge, but also testing this notion with a sensitive, uncensored and unobtrusive method (i.e., physiological markers of threat and challenge).

Finally, this study has implications for our understanding of achievement gaps between different social groups. One important psychological factor shaping these achievement gaps is the attributions individuals make for setbacks, or negative outcomes. For example, work by Greg Walton and Geoffrey Cohen (2007; 2011) has highlighted that members of racial minority groups often see setbacks at university as a sign that they do not belong there. In making these attributions to group membership, or lack of belongingness, these students disengage with learning and often drop out of university (see also Good, Rattan, & Dweck, 2012). That is, attributions for negative outcomes have an important role to play in shaping motivation and subsequent achievement. Specifically, attributions can influence future action by reducing individuals' motivation (Weiner, 1985) or undermine individuals' performance on a subsequent task (Dweck et al., 1993). The process of how people try to understand a failure and the extent to which attributions are threatening might influence individuals' expectation of

future success/failure. Research suggest that encountering discrimination can reduce individuals' performance on a task which can contribute to explain the achievement gap among members of stigmatised groups (Becker & Luthar, 2002; National Center for Education Statistics, 2000; Steele, 1997; Weinstein, 2002). However, in an ambiguous situation, making attributions might not be straightforward. As it was found in my research, the perceived stability of attributions can affect how threatening attributions are perceived to be, as well as whether or not they are made. These threatening consequences might in fact lead people to feel powerless and disengage from a task (Ross & Broh, 2000). Therefore, effects of attributional stability and how this shapes people's attribution for and responses to setbacks might help to explain why achievement gaps exist among different social groups.

8.3 Limitations and Future Directions

Although this research provides interesting insights, it suffers from a few limitations that must be acknowledged. First, one methodological issue in Study 2a was that I failed to show an effect of the manipulation of stability/pervasiveness of discrimination on the manipulation check. In addition, both in Studies 2a and 2b (Chapter 5), suffered from a low sample size, particularly due to the loss of considerable data due to technical faults. These two problems were address in Study 3, but they remain important limitations of two of the studies reported in this thesis.

Although using psychophysiological data (particularly CV responses) can be very beneficial when observing unobtrusive responses indicative of threat and challenge, at the same time this method is very a time consuming, in terms of both data collection and preparation for analysis. Collecting data is time consuming because lengthy protocols need to be observed to attach participants to the required equipment, calibrate the equipment, and obtain baseline and experimental measures There are some instances when, due to skin humidity, electrodes would not stick on and experimenters need to wait for a while until participants' skin is dry in order

to proceed with the study. When preparing the data file, the data from each task for each participant should be calculated separately and entered in the data file manually which takes a considerable amount of time. What these practical considerations mean is that when conducting this type of research, one has to make a choice between collecting data from large samples or conducting multiple studies. My choice was to conduct two smaller studies (2a and 2b) with which I could gather some preliminary evidence and test the paradigm and complement this with one large and very time consuming study (Study 3), with improved methods based on the limitations of studies 2a and 2b that would provide conclusive evidence. The limitation here is that I was unable to delve further into some of the issues that Study 3 raised.

It is possible that when preparing for the speech delivery task participants are already coping with the stressor, and this might modify their experience of the task itself. This means that maybe what I am accessing during the speech task is no longer the threat experienced as a function of the rejection, but something further down the line. So, it is possible that there might be other ways of assessing threat that do not require such a motivated performance task and that can more directly tap into how participants are feeling at different points in time—and differentiate between the immediate threat of rejection and the potentially ‘coped with’ threat. Future research might wish to explore this possibility. Despite my attempts to focus on the threat of rejection, as a function of how it is attributed, it is still impossible to pin down with complete accuracy exactly what might be driving threat experiences and that more research is needed to further specify this.

A different issue is that my interest in this thesis was, specifically, on threat and challenge, but there are, of course, other emotional states that could be relevant to examine in this context. For example, we know already that anger, disappointment, and frustration are common reactions to prejudice and discrimination (Swim, Hyers, Cohen, & Ferguson, 2001; Williams, John, Oyserman, Sonnega, Mohammed, & Jackson, 2012; Van Zomeren, Spears, &

Leach, 2008), so it could be beneficial to examine these emotions in contexts such as the one I observed. In addition, the threat and challenge composites that I used, though inspired by conceptual consideration, differed also in valence. This is part and parcel of how these two emotional states differ but including additional composites of negative and positive emotions that do not tap into threat or challenge and comparing the effects of the manipulations on all these composites would clarify the nature of the effects. This can be addressed in future research.

Future research can focus on other ways to make stability of attributions to discrimination and to lack of ability more comparable. This can advance understanding the extent to which these attributions are perceived as a threat. More specifically, another way to make stability of ability and discrimination more parallel to each other is to take on board that just as people differ in whether they regard ability as fixed vs. malleable, they also differ in whether they see prejudice as fixed vs. malleable. Research has indicated that when members of non-stigmatized groups believe that prejudice is malleable, they are more likely to adopt learning strategies, through which they attempt to understand and learn more about the intergroup interaction and how they can better deal with it. By contrast, those who believe that bias and prejudice is fixed, are more likely to avoid the intergroup interaction (Neel & Shapiro, 2012). In addition, fixed beliefs about prejudice can result in more anxiety and unfriendly interactions than when people believe that prejudice is malleable (Carr, Dweck, & Pauker, 2012). If looked at in this way, the malleability of ability and of prejudice are more parallel because they both imply a focus on learning how to better navigate the situation. This suggests that future research can focus on manipulating the malleability of prejudice beliefs (rather than of attributions to discrimination) in order to be able to compare malleability of attributions to lack of ability and to discrimination in a more parallel way.

Although this research helps to understand the mechanism underlying attributions made by members of stigmatised groups, my research focused only on women. Though some basic processes are expected to be similarly across different stigmatized groups, this should not be merely assumed, so it is important to test these processes in other stigmatised groups, such as HIV-infected individuals. The prevalence of discrimination against people living with HIV is high (Letamo, 2003; Swendeman, Rotheram-Borus, Comulada, Weiss, & Ramos, 2006) and public attitudes towards these individuals are generally very negative, especially because this infection can be transmitted and people see HIV-infected individuals as responsible for the onset of their condition and stigma (Chellan, Charles, Nanjan, & Periyathambi, 2011; Wingood, Diclemente, Mikhail, & McCree, 2008; Molero, Fuster, Jetten, & Moriano, 2011). Due to these reasons, one can argue that attributing a negative outcome to discrimination might have even more serious consequences for people living with HIV, compared with other stigmatised groups that are less stigmatized. In addition, HIV is a concealable stigma, that is, individuals can choose to hide or disclose their status, and this is an important coping strategy that might enable avoidance of future discrimination, even when it is perceived as pervasive. As such, it could be beneficial for future research to look at the mechanisms that affects attributions that are made among individuals who are HIV+. More specifically, how hiding/disclosing stigma can influence the extent to which each attribution is made and how specific attribution can influence the experience of threat/challenge.

Finally, though my research as carried out with women, the paradigms I used did not focus on domains where women are particularly negatively stereotyped. In such domains, on the one hand discrimination tends to be more pervasive, but on the other hand women are more likely to attribute setbacks to lack of belonging, that is, to not having the necessary ability to deserve better. For example, Dickhäuser and Stiensmeier-Pelster (2002) discuss that women are more likely to attribute their failure in using computers to their ability, which can lead to

feeling of shame and consequently lowered expectation of future success. The role that attributional stability might play in these contexts is as yet unknown so future research in this area can benefit by examining how attributional stability can affect making attributions in domains where members of stigmatised groups are negatively stereotyped.

8.4 Conclusion

In summary, this research indicated the effects of attributional stability on perceived threat and challenge when making attributions for a negative outcome. Our findings are suggestive of when attributions are more threatening, but less conclusive on how attributional stability influences the extent to which people make attributions to discrimination and to lack of ability. Nevertheless, these findings move the field forward by questioning some of the assumptions that guided quite a large body of research on social stigma and uncovers a variety of paths for future research.

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Appendix A: Full Wording of the Scenarios and Questionnaire of Study 1 (Chapter 4)

A.1 Informed Consent

Informed Consent

The goal of this study is to examine how people perceive certain situations. You are asked to read two scenarios and to answer some questions about these scenarios. The study should take approximately 5 minutes.

Taking part in this study is completely voluntary and you can quit at any time. Although it is important for us that you answer all questions asked, if for some reason you feel you would rather not answer a particular question, you are free to leave it unanswered. All responses are anonymous and confidential. There are no individual results of this research—we will only look at responses at the aggregate level.

If you have any further questions about this study, please contact Melika Janbakhsh at mj268@exeter.ac.uk (PhD candidate supervised by Prof. Manuela Barreto).

If you are willing to continue, please tick this box

Thank you in an advance for you collaboration.

A.2 Questionnaire

A.2.1 Attributions' characteristics

Please read the first scenario and answer questions 1 to 5. Please do not read the second scenario before you answer this first set of questions. Once you are finished with questions 1 to 5, you can go on to read the second scenario.

Scenario 1

Imagine you applied for a job that you saw advertised online. The job seemed very interesting and had a very attractive compensation package. The selection criteria for this job are described in the advertisement. You think that, although you do not fulfil all of the requirements, it is worth a shot. You have written an application letter, handed in your CV, and added all of the requested documentation. A week after the deadline you receive a letter from the chair of the interview panel. The letter thanks you for your application, describes the high number of candidates and informs you that, unfortunately, you are not invited for an interview. The letter also specifies that the reason why you were not shortlisted for an interview is that you did not have the specific skills required for this job. You discuss this with a girl friend and the two of you come to the conclusion that in fact you did not have the required abilities for this post.

Please think about this situation carefully and answer the following questions. In this situation, thus, you did not succeed at getting something you wanted because in fact you did not have the required ability.

1. To what extent do you think that, when you encounter situations similar to this one (i.e., when you do not get something because you do not have the required ability), the cause of failure is something internal or external to you?

Completely internal 1 2 3 4 5 6 7 Completely external

2. To what extent do you think that ability is something stable or unstable over time?

Completely stable 1 2 3 4 5 6 7 Completely unstable

3. To what extent do you think that ability is something you can (or cannot) control?

Can control completely 1 2 3 4 5 6 7 Cannot control at all

4. To what extent do you think that ability is something that can fluctuate over time (i.e., that can get better or worse)?

Not at all 1 2 3 4 5 6 7 Very much

5. To what extent do you believe that improving your ability is something that is under your control?

Not at all 1 2 3 4 5 6 7 Very much

Now please read the second scenario and answer the following questions.

Scenario 2

You come across a job opportunity that you find really exciting. You are happy to see that you fulfil all of the requirements listed and decide to apply for the job. Sometime after the deadline you receive a letter from the recruitment panel thanking you for your application and stating that they have received a large number of applications. The letter also states that there were more qualified candidates than you so they will not be interviewing you for this position. You call the company to request more information and speak to a secretary who repeats what is written in the letter. Before you hang up, however, she says “between us, I bet this happened because you are a woman. The committee only had men, and the chair is known for his old-fashioned beliefs about how women should stay at home to look after the kids. Quite a lot of women applied and none was invited for an interview”. You are shocked to hear this and conclude that you were discriminated against because you are a woman.

Please think about this situation carefully and answer the following questions. In this situation, thus, you did not succeed at getting something you wanted because you were discriminated against.

1. To what extent do you think that when/if you are discriminated against because of your gender you can say that the cause of failure is something internal or external to you?

Completely internal 1 2 3 4 5 6 7 Completely external

2. To what extent do you think that being a target of gender discrimination is something stable or unstable over time?

Completely stable 1 2 3 4 5 6 7 Completely unstable

3. To what extent do you think that being a target of discrimination is something you can (or cannot) control?

Can control completely 1 2 3 4 5 6 7 Cannot control at all

4. To what extent do you think that being a target of discrimination is something that can fluctuate over time (i.e., that can better or worse)?

Not at all 1 2 3 4 5 6 7 Very much

5. To what extent do you believe that avoiding discriminatory treatment is something that is under your control?

Not at all 1 2 3 4 5 6 7 Very much

A.2.2 System justification beliefs

Now please read the following questions and answer them carefully.

1. If people work hard they almost always get what they want.

Strongly agree 1 2 3 4 5 6 7 *Strongly disagree*

2. Most people who don't get ahead should not blame the system; they really have only themselves to blame.

Strongly agree 1 2 3 4 5 6 7 *Strongly disagree*

3. In the UK, getting ahead doesn't always depend on hard work.

Strongly agree 1 2 3 4 5 6 7 *Strongly disagree*

4. Even if people work hard, they don't always get ahead.

Strongly agree 1 2 3 4 5 6 7 *Strongly disagree*

5. The UK is an open society where all individuals can achieve higher status.

Strongly agree 1 2 3 4 5 6 7 *Strongly disagree*

6. Advancement in British society is possible for all individuals.

Strongly agree 1 2 3 4 5 6 7 *Strongly disagree*

7. Individual members of certain groups have difficulty achieving higher status.

Strongly agree 1 2 3 4 5 6 7 *Strongly disagree*

8. Individual members of certain groups are often unable to advance in British society.

Strongly agree 1 2 3 4 5 6 7 *Strongly disagree*

9. United Kingdom is a just society where differences in status between groups reflect actual group differences.

Strongly agree 1 2 3 4 5 6 7 *Strongly disagree*

10. Differences in status between groups in British society are fair.

Strongly agree 1 2 3 4 5 6 7 *Strongly disagree*

11. Differences in status between groups in British society are the result of injustice.

Strongly agree 1 2 3 4 5 6 7 *Strongly disagree*

12. It is unfair that certain groups in the UK have poorer living conditions than other groups.

Strongly agree 1 2 3 4 5 6 7 *Strongly disagree*

Finally, please indicate the following information about yourself:

Gender: Male Female

Age: _____ years old

Nationality: _____

This is the end of this study. Thank you very much for your participation.

Appendix B: Informed Consent, Pilot Study Questionnaire, Evaluation Sheet, Complete Questionnaire for Studies 2a and 2b (Chapter 5)

B.1 Experiments 2a and 2b Participants' Informed Consent

The goal of this study is to examine the psychological and physiological experience of the employment interview process. We are trying to understand how people physically and psychologically respond to a job interview. This study should take approximately 45 minutes.

If you agree to participate, you will be asked to engage in an online job interview and complete a range of different tasks. All of this will happen through the computer. During the whole study, we will monitor your physiological state—such as heart rate and blood pressure. To do so, we will place 6 stickers at the back of your neck, in your back, and chest. We will show you how to place them, but you will be allowed to do so yourself, if you prefer. Also, you will be asked to wear a cuff on your arm and fingers that will inflate and deflate throughout the study. You will be asked to stay as still as possible throughout the study so that the stickers and cuffs do not get out of place and the measurement is reliable. In case you feel distressed or discomfort, you can call the experimenter (by ringing a bell placed next to the computer).

During the study you will also be asked to deliver a short speech, which will be video recorded. If you would prefer to have this recording deleted, at the end of the study, you can say so to the experimenter and we will be sure to delete the recording. Otherwise, it will be filed in a safe location, in a locked cupboard, and will remain strictly confidential.

Taking part in this study is completely voluntary and you can quit at any time. All responses are anonymous and confidential. There are no individual results of this research — we will only look at responses at an aggregate level.

This study was approved by the School of Psychology Ethics Review. If you have any further questions about this study please contact Melika Janbakhsh at mj268@exeter.ac.uk

(PhD student supervised by Prof. Manuela Barreto, School of Psychology, University of Exeter).

If you agree to take part in this study, please indicate your agreement by signing on the next page.

Thank you in an advance for you collaboration.

B.2 Piloted Picture Questionnaire

Thank you for agreeing to take part in this study.

The study will only take a few minutes to complete. It does not involve personal questions or any sensitive issues. Your participation is completely voluntary and you are free to stop at any time. If you want to know more or want to express any further thoughts about this study, feel free to contact me or my supervisor at mj268@exeter.ac.uk or m.barreto@exeter.ac.uk.

Please tick the box below to indicate that you have read this information and agree to participate:

I have read this information and agree to participate in this short study

Before answering each set of questions, the experimenter will show you a picture. Please look at the picture for a few seconds and then answer each question by circling the number that best represents your opinion. Please do not think too long about each question—what matters is your first impression.

Thank you again for agreeing to take part!

Please look at the first picture the experimenter is showing you for a few seconds and answer the questions below:

1. How **friendly** does this person seem to you?

Not at all friendly **1** **2** **3** **4** **5** **6** **7** Very friendly

2. How **competent** does this person seem to you?

Not at all competent **1** **2** **3** **4** **5** **6** **7** Very competent

3. How **professional** does this person seem to you?

Not at all professional **1** **2** **3** **4** **5** **6** **7** Very professional

4. How **attractive** do you find this person?

Not at all attractive **1** **2** **3** **4** **5** **6** **7** Very attractive

5. If you were told that this person is a **human resource manager**, to what extent would you find that credible?

Not at all **1** **2** **3** **4** **5** **6** **7** Very much

6. If you were told that this person is **sexist**, to what extent would you find that credible?

Not at all 1 2 3 4 5 6 7 Very much

B.3 Evaluation Form

Date: 06/March/2015

The interviewer: Mr. Peter Wilson

Participant's number: a20

Skill evaluation

	Rating				
	1	2	3	4	5
Job skills	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verbal skills	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motivation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Creative potential	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intelligence	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social skills	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall evaluation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = poor, 5 = excellent

Recommendation

Accept

Reject

B.4 Questionnaire

B.4.1 Checks

Please register here the feedback you just received from the interviewer:

1. What did the interviewer think about your performance in the interview?

1= Very negative 2= Very positive

2. Did the interviewer recommend that you'd be accepted or rejected?

1= Accepted 2= Rejected

B.4.2 Attributions to Discrimination and to Lack of Ability

3. The recommendation I received from the interviewer was mainly due to my performance during the interview (what I said and how I behaved).
4. The recommendation I received from the interviewer was mainly due to my interview skills.
5. The recommendation the interviewer made corresponds to what I expected, given how the interview went.
6. I think the recommendation the interviewer made was appropriate/fair.
7. The recommendation I received from the interviewer was mainly due to prejudice on the part of the interviewer.
8. The recommendation I received from the interviewer was mainly due to a biased opinion on the part of the interviewer.

Not at all 1 2 3 4 5 6 7 Very much

B.4.3 Emotion

Threat

1. To what extent do you feel ANXIOUS right now?
2. To what extent do you feel WORRIED right now?

3. To what extent do you feel CALM right now?
4. To what extent do you feel RELAXED right now?
5. To what extent do you feel THREATENED right now?

Challenge

6. To what extent do you feel EAGER right now?
7. To what extent do you feel CONFIDENT right now?
8. To what extent do you feel CHALLENGED right now?
9. To what extent do you feel DISCOURAGED right now?
10. To what extent do you feel LOW right now?
11. To what extent do you feel DISAPPOINTED right now?
12. To what extent do you feel SAD right now?

Added for study 2b:

13. To what extent do you feel HELPLESS right now?

Not at all 1 2 3 4 5 6 7 Very much

B.4.4 Speech Delivery Questions

1. How stressful was it for you to deliver the speech about your work abilities?
2. How much effort did you exert during the speech task?
3. How well do you think you performed at the speech task?

Added for study 2b:

1. If you think back to the moments just BEFORE you delivered your speech, to what extent did you feel stressed about doing this speech?

2. BEFORE delivering your speech, to what extent did you feel that you had what it takes to perform this task well?

3. BEFORE delivering your speech, to what extent did you feel that you were prepared for delivering the speech?

Not at all 1 2 3 4 5 6 7 Very much

B.4.5 Manipulation Check

Study 2a (manipulating stability of discrimination)

1. To what extent do you think that, overall, people of the same gender group as yourself are respected by others?

2. To what extent do you think that most people consider your gender group to be unworthy?

3. To what extent do you think that women as a group face a good deal of sexism?

Study 2b (manipulating stability of ability)

1. To what extent do you think that you have a certain amount of ability to do well in job interviews and you really can't do much to change it?

2. To what extent do you think that your ability to do well in job interviews is something about you that you can't change very much?

3. To what extent do you think that you can learn new things, but you can't really change your basic ability to do well in a job interview context?

Not at all 1 2 3 4 5 6 7 Very much

**Appendix C: Full wording of Informed Consent, Manipulations, Evaluation Forms,
Questionnaires, Physiological Responses Diary, and Debriefing form of Study 3
(Chapter 6)**

C.1 Informed Consent

Informed Consent: Study “3”

This study includes two separate studies: A main study and a small pilot study that will take place during a short pause in the main study.

The goal of the main study is to examine the psychological and physiological experiences of the employment interview process. We are trying to understand how people physically and psychologically respond to a job interview. This is what you will spend most of the session doing. During a short pause in the main study, we will ask you to take part in a short pilot study. This pilot study consists of reading a text about a societal issue and answering a few questions about it. This serves to help us prepare materials for a future study. In total, this laboratory session will take approximately 50 minutes.

If you agree to participate, for the main study you will be asked to engage in an online job interview for a project manager position, at an international firm, and to complete a range of tasks. All of this will happen through the computer. During the whole study, we will monitor your physiological state—such as heart rate and blood pressure. To do so, it is necessary to place 6 stickers at the back of your neck, in your back, and in your chest. We will show you how to place them, but you will be allowed to do so yourself, if you prefer. Also, you will be asked to wear a cuff on your non-dominant arm and fingers that will inflate and deflate throughout the study. You will need to stay as still as possible throughout the study so that the stickers and cuffs do not get out of place and the measurement is reliable.

The study is not expected to be distressing to the average student. However, if you have a history of anxiety you might respond more extremely to the interview situation. In this case, you might prefer not to take part in this study. If you choose to participate, in case you feel distressed or discomfort, you must either call the experimenter or ring the bell placed next to the computer. The experiment is right outside the door and will come immediately to your assistance.

During the study you will also be asked to deliver a short speech, which will be video recorded. At the end of the study you can let us know if you would prefer us to delete this recording. Otherwise, it will be filed in a safe location, in a locked cupboard, and will remain strictly confidential.

Taking part in this study is completely voluntary and you can quit at any time. All responses are anonymous and confidential. There are no individual results of this research — we will only look at responses at an aggregate level. If you agree to take part in this study, you can either receive 1 study credit (if you are a first year Psychology student) or £5, as a token of appreciation—please let the experimenter know which you prefer.

This study was approved by the School of Psychology Ethics Committee. If you have any further questions about this study please contact Melika Janbakhsh at mj268@exeter.ac.uk (PhD student supervised by Prof. Manuela Barreto, School of Psychology, University of Exeter). If you have any complaints about the study, please contact my supervisor Prof Barreto at m.barreto@exeter.ac.uk or the chair of the Psychology ethics committee Dr Kurz at t.kurz@exeter.ac.uk.

If you agree to take part in this study, please indicate your agreement by signing on the next page. Thank you in an advance for you collaboration.

I have read the information provided about this study and agree to participate in exchange for £5 or 1 study credit. I will make my choice known to the experimenter.

C.1.1 Informed Consent for Control Condition

Informed Consent: Study “3”

The goal of the main study is to examine the psychological and physiological experiences of the employment interview process. We are trying to understand how people physically and psychologically respond to a job interview. In total, this laboratory session will take approximately 45 minutes.

If you agree to participate, for the main study you will be asked to engage in an online job interview for a project manager position, at an international firm, and to complete a range of tasks. All of this will happen through the computer. During the whole study, we will monitor your physiological state—such as heart rate and blood pressure. To do so, it is necessary to place 6 stickers at the back of your neck, in your back, and in your chest. We will show you how to place them, but you will be allowed to do so yourself, if you prefer. Also, you will be asked to wear a cuff on your non-dominant arm and fingers that will inflate and deflate throughout the study. You will need to stay as still as possible throughout the study so that the stickers and cuffs do not get out of place and the measurement is reliable.

The study is not expected to be distressing to the average student. However, if you have a history of anxiety you might respond more extremely to the interview situation. In this case, you might prefer not to take part in this study. If you choose to participate, in case you feel distressed or discomfort, you must either call the experimenter or ring the bell placed next to the computer. The experiment is right outside the door and will come immediately to your assistance.

During the study you will also be asked to deliver a short speech, which will be video recorded. At the end of the study you can let us know if you would prefer us to delete this

recording. Otherwise, it will be filed in a safe location, in a locked cupboard, and will remain strictly confidential.

Taking part in this study is completely voluntary and you can quit at any time. All responses are anonymous and confidential. There are no individual results of this research — we will only look at responses at an aggregate level. If you agree to take part in this study, you can either receive 1 study credit (if you are a first year Psychology student) or £5, as a token of appreciation—please let the experimenter know which you prefer.

This study was approved by the School of Psychology Ethics Committee. If you have any further questions about this study please contact Melika Janbakhsh at mj268@exeter.ac.uk (PhD student supervised by Prof. Manuela Barreto, School of Psychology, University of Exeter). If you have any complaints about the study, please contact my supervisor Prof Barreto at m.barreto@exeter.ac.uk or the chair of the Psychology ethics committee Dr Kurz at t.kurz@exeter.ac.uk.

If you agree to take part in this study, please indicate your agreement by signing on the next page. Thank you in an advance for you collaboration.

I have read the information provided about this study and agree to participate in exchange for £5 or 1 study credit. I will make my choice known to the experimenter.

C.2 Manipulation of Pervasiveness of Discrimination

Discrimination against women in the workplace is widespread

By T. McCoy, Associated Press

Women still face widespread discrimination in many important areas of life. According to a recent study published in this journal in July 2015, discrimination against women has remained unchanged in the last 10 years (see Figure 1). As a result, women still routinely face sexism or discrimination in salary, education, politics, the courtroom, and in everyday interpersonal inter-

actions. In addition, the gender gap in salaries remains wide, with researchers estimating that in 2017 women will still make only 60% of what their male colleagues make for the same job and with equal amount of experience. According to this research, over 80% of men hold sexist attitudes and will discriminate against women in the workplace if given the opportunity. The pervasiveness of sexism and gender discrimination in British companies is further high-lighted in another survey of British managers published last year by the British Psychology Society (BPS), which indicated that most company managers around the UK see female professionals as incompetent, irrational, and weak. These data suggest that gender discrimination rates are hard to change: They seem to be ingrained in our society's structure.

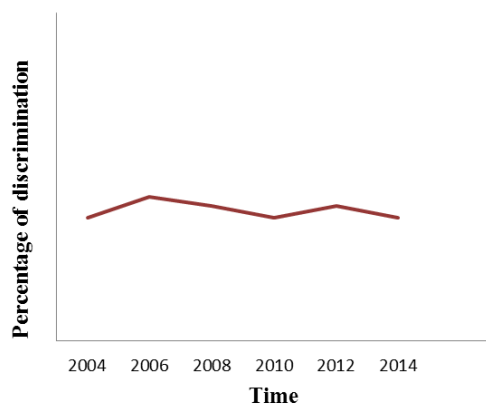


Figure 1. Discrimination across time

Discrimination against women in the workplace is rare

By T. McCoy, Associated Press

Discrimination against women is now rare in many important areas of life. According to a recent study published in this journal in July 2015, discrimination against women has significantly decreased in the last 10 years (see Figure 1). As a result, women nowadays face relatively infrequent sexism or discrimination in salary, education, politics, the courtroom, and

in everyday interpersonal interactions. In addition, the gender gap in salaries is closing fast, with researchers estimating that the salaries of men and women who perform similar jobs will be equal by 2017. According to this research, more than 80% of men hold non-sexist attitudes and are willing to promote gender equality at workplace. The fact that sexism and gender discrimination are now rare in British companies is further highlighted in another survey of British managers published last year by the British Psychology Society (BPS), which indicated that most company managers around the UK see female professionals as competent, rational, and strong. These data suggest that gender discrimination can be fought successfully: Our society is changing to become a more equal environment for all.

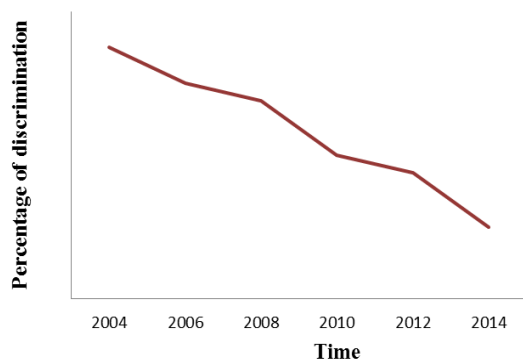


Figure 1. Discrimination across time

C.2.1 Gender discrimination manipulation checks

Text clarity

Thank you for agreeing to take part in this short study.

The study will only take a few minutes to complete. It does not involve personal questions or any sensitive issues. Your participation is completely voluntary and you are free to stop at any time.

If you want to know more or want to express any further thoughts about this study, feel free to contact my supervisor at m.barreto@exeter.ac.uk.

Please tick the box below to indicate that you have read this information and agree to participate:

I have read this information and agree to participate in this short study

Please read the article attached to this page carefully and answer the comprehension questions below (Please circle clearly around the number that reflects your answer):

How clear do you think this text is? (That is, how well do you understand the key point of the article?)

1	2	3	4	5	6	7
Not at all						Very much

To what extent do you think that the key point made in the article is well argued?

1	2	3	4	5	6	7
Not at all						Very much

According to the article, has gender discrimination against women declined, increased, or remained the same?

1	2	3
Declined	Increased	Remained the same

According to the article, these days, is the gender gap in salaries small or large?

1	2	3	4	5	6	7
Very small						Very large

According to the article, how do most company managers rate female professionals?

1	2	3	4	5
competent but irrational	rational but incompetent	rational but weak	competent and strong	Incompetent and irrational

All in all, according to the article, to what extent do women face discrimination?

1	2	3	4	5	6	7
Not at all						Very much

To what extent do you think that women have equal chances to men?

1	2	3	4	5	6	7
Not at all						Very much

How rare/pervasive do you think that discrimination against women is currently in British society?

1	2	3	4	5	6	7
Very rare						Very pervasive

C.3 Manipulation of Stability of Ability

The nature of ability: You either have it or you don't

By T. McCoy, Associated Press

According to a recent study published in this journal in July 2015, people's basic abilities do not change much over their life span. This study measured the abilities of a large sample of individuals from a variety of socio-economic backgrounds who are representative of the British population. The researchers measured a range of basic cognitive abilities (e.g., reasoning style) and social skills (e.g., the ability to empathize with others) that are fundamental for a large number of outcomes in life, from everyday social functioning, to work performance. Measures were taken, with well validated tests, every year over a period of 10 years. The results showed that there was little change in abilities across time (see Figure 1). In other words, the level of ability that participants demonstrated in the beginning of the study was very similar to the level of the same ability observed 10 years later: No improvement could be detected over the years. The effects of practice and training were also examined. However, the research showed that practice and training had no significant benefits—they had only some superficial effects (e.g., increasing speed in mechanical tasks). That is, individual's fundamental ability to perform well on a certain dimension did not change. The researchers conclude that one's ability to do well

in many important domains is shaped in early adulthood and is highly resistant to change across one's lifetime. It follows that if you are good at something, you are likely to remain good at it. However, if you are not very good at doing certain things, then change is unlikely. According to the researchers, these findings suggest that it is important to realise what one is really good at and stick to it. When it comes to ability, it's simple: You either have it or you don't!

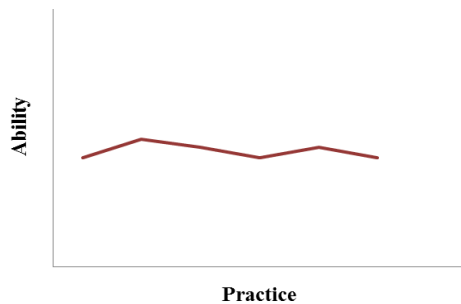


Figure 1. Ability and practice during 10 years

The nature of ability: Practice makes perfect

By T. McCoy, Associated Press

According to a recent study published in this journal in July 2015, people's basic abilities are changeable and can be improved over their life span. This study measured the abilities of a large sample of individuals from a variety of socio-economic backgrounds who are representative of the British population. The researchers measured a range of basic cognitive abilities (e.g., reasoning style) and social skills (e.g., the ability to empathize with others) that are fundamental for a large number of outcomes in life, from everyday social functioning, to work performance. Measures were taken, with well validated tests, every year over a period of 10 years. The results showed that there was a substantial improvement in abilities across time (see Figure 1). In other words, the level of ability that participants demonstrated in the beginning of the study was significantly lower than the level of the same ability observed 10 years later: There was evidence for considerable development over the years. The effects of

practice and training were also examined. The research showed that practice and training had significant benefits—training resulted not only in some superficial benefits (e.g., increasing speed in mechanical tasks), but also in measurable improvements in individual’s fundamental ability to perform well on a certain dimension. The researchers conclude that one’s ability to do well in many important domains is flexible and heavily depends on learning the right skills. It follows that if you are not good at something, then you just need to keep practicing in order to see improvement. According to the researchers, these findings suggest that it is important to realise what one is not so good at and focus on practicing and training in those areas to improve one’s ability. When it comes to ability, it’s simple: Practice makes perfect!

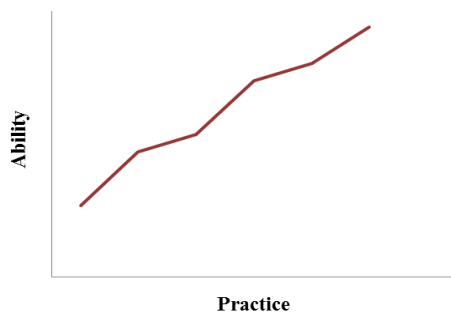


Figure 1. Ability and practice during 10 years

C.3.1 Ability Manipulation checks

Text clarity

Thank you for agreeing to take part in this short study.

The study will only take a few minutes to complete. It does not involve personal questions or any sensitive issues. Your participation is completely voluntary and you are free to stop at any time.

If you want to know more or want to express any further thoughts about this study, feel free to contact my supervisor at m.barreto@exeter.ac.uk.

Please tick the box below to indicate that you have read this information and agree to participate:

I have read this information and agree to participate in this short study

Please read the article attached to this page carefully and answer the comprehension questions below (Please circle clearly around the number that reflects your answer):

How clear do you think this text is? (That is, how well do you understand the key point of the article?)

1	2	3	4	5	6	7
Not at all						Very much

To what extent do you think that the key point made in the article is well argued?

1	2	3	4	5	6	7
Not at all						Very much

Did the study show that participants' abilities improved, got worse, or stayed the same after 10 years?

1	2	3
Got worse	Stayed the same	Improved

What did the study show about practice: Did it improve participants' basic abilities, make them worse, or did it not have any effect?

1	2	3
Made abilities worse	Did not have any effect	Improved abilities

All in all, to what extent do you think that one's basic cognitive and social abilities (such as reasoning style and ability to empathize) can be changed across one's life?

1	2	3	4	5	6	7
Cannot change at all						Can change very much

To what extent do you think that one can't really improve one's performance on tasks that involve these basic cognitive and social abilities?

1	2	3	4	5	6	7
Cannot change at all						Can change very much

C.4 Evaluation Form

C.4.1 Gender Bias Evaluation Form

Evaluation Form

Date: 23/March/2017

The interviewer: Mr. Peter Wilson

Participant's number: a20

Skill evaluation

	Rating				
	Poor	2	3	4	Excellent
Communication skills	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motivation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Creative potential	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Confidence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intelligence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social skills	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall evaluation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Recommendation

Accept

Reject

Additional comments: I'm sorry to say I wouldn't be able to recommend you for a project management position in a large multi-national company. I find that most female graduates do not seem to be suitable for such positions of responsibility, and you've come across as a typical representative of this type of applicants. Jobs in multi-national corporations require dedication and certain priority-setting that most applicants from your demographic group just cannot match. I'm sorry if this sounds harsh, but this opinion is based on experience...

C.4.2 Lack of Ability Evaluation Form

Evaluation Form

Date: 24/March/2017

The interviewer: Mr. Peter Wilson

Participant's number: a20

Skill evaluation

	Rating				
	Poor	2	3	4	Excellent
Communication skills	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motivation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Creative potential	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Confidence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Intelligence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social skills	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall evaluation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Recommendation

Accept

Reject

Additional comments: I'm sorry to say I wouldn't be able to recommend you for a project management position in a large multi-national company. It seems that you lack some essential skills and qualities necessary to succeed in a large company environment. Your answers were quite unconvincing, you failed to demonstrate self-confidence and leadership potential, and, generally, haven't come across as a suitable candidate. I'm sorry if this sounds harsh, but this opinion is based on experience...

C.5 Questionnaire

C.5.1 Checks

1. What did the interviewer think about your performance in the interview?

Very negative 1 2 3 4 5 6 7 Very positive

2. Did the interviewer recommend that you'd be accepted or rejected?

1= Accepted 2= Rejected

C.5.2 Attributions Questionnaire

Not at all 1 2 3 4 5 6 7 Very much

9. The recommendation I received from the interviewer was mainly due to my performance during the interview (what I said and how I behaved; Attributions to lack of ability).
10. The recommendation I received from the interviewer was mainly due to my interview skills (Attributions to lack of ability).
11. The recommendation I received from the interviewer was mainly due to prejudice on the part of the interviewer (Attributions to discrimination).
12. The recommendation I received from the interviewer was mainly due to a biased opinion on the part of the interviewer (Attributions to discrimination).

C.5.3 Speech Delivery Appraisals Questionnaire

Not at all 1 2 3 4 5 6 7 Very much

Before the speech

1. How stressed do you feel about delivering a speech about your work abilities?
2. To what extent do you think that you will be able to handle this task successfully?
3. To what extent do you believe that you are capable of delivering a speech that will be positively evaluated by the new HR manager who will evaluate it?

After the speech

To what extent do you think your performance during the speech task met your expectations of how you would be able to perform?

C.5.4 Emotion Questionnaire

Not at all 1 2 3 4 5 6 7 Very much

Threat

1. I feel ANXIOUS right now.
2. I feel WORRIED right now.
3. I feel CALM right now.
4. I feel RELAXED right now.
5. I feel THREATENED right now.

Challenge

6. I feel EAGER right now.
7. I feel CONFIDENT right now.
8. I feel ENERGISED right now.
9. I feel INVIGORATED right now.
10. I feel DISCOURAGED right now.
11. I feel UNMOTIVATED right now.
12. I feel HELPLESS right now.

C.5.5 Gender Identification Questionnaire

Not at all 1 2 3 4 5 6 7 Very much

1. Being a woman is an important part of my identity.
2. Being a woman is an important reflection of who I am.
3. I feel solidarity with other women.
4. I identify with my gender group.

C.6 CV Responses Scoring Diary

The report presented below is the diary of CV responses scoring which indicates cases that needed to be treated differentially, such as wiping the errors out in HR or BP, or using

different techniques for calculating data. These errors mainly appear because of participant's movement during the study.

1. 133 SPD – excluded BP,
 - a. Prep, because of lost dz/dt only use the last 40 sec.
 - b. Baseline – one BP connected end-point
2. 138 Prep – excluded last 9 sec because of unstable BP, and ECG
3. 146 SPD – 2 connected endpoint in HR
4. 159 Baseline – excluded the last 6 sec because of unstable dz/dt and ECG.
5. 164 SPD – excluded the first 14 sec due to BP instability
6. 165 Baseline – used only the last 48 sec due to BP instability
 - a. SPD – used the first 50 sec due to BP instability
7. 178 Baseline – 1 min calculated after sec 28
8. 205 Baseline – 1 min is calculated after 32 sec due to BP instability
9. 214 Baseline – mid 43 sec (from 3 sec to 46 [from the end is counted]) due to dz/dt instability.
10. 65 Baseline – excluded the first 4 sec due to movement.
11. 92 Prep – used middle 50 sec due to inconsistency
12. 7 – Used peak down, and instead of Q point, R-peak onset was used – used LA HR
13. 93 – Used find rate for HR for Prep and SPD. For baseline only wiped out HR errors.
14. 25 – Prep HR derived from LA HR and the errors wiped out
15. 40 SPD – HR derived from LA HR and the errors were wiped out.
16. 66 – ECG peak was chosen to be down, Prep – HR derived from LA HR and the errors wiped out
17. 113 SPDC – excluded the first 7 sec due to BP instability.
18. 121 SPD – HR derived from LA HR
19. 173 – Prep, wiped HR errors, SPD, used find rate
20. 203 – SPD, HR derived from LA HR
21. 243 – HR derived from LA HR
22. 247 – Baseline – find rate was used for HR
23. 121 – Prep – HR derived from LA HR

Excluded participants

1. 5 – unstable ICG during baseline
2. 8 – lost ICG
3. 10 – wavy dz/dt and flat Z(t), thus, unable to be scored
4. 14 – wrong evaluation form
5. 15 – participants with heart condition
6. 16 – unstable baseline – EX
7. 20 – quit
8. 25 – BD disconnection – took part in a study which involved a very similar method
9. 26 – loose electrodes
10. 34 – lost dz/dt

11. 44 – unstable dz/dt , thus, unable to be scored
12. 43 – ICG disconnection
13. 51 – lost ECG
14. 69 – very low HR, Baseline = 35
15. 71 – lost dz/dt baseline
16. 74 – this participant quit the study
17. 79 – loose electrodes
18. 81 – excluded due to mistake in the article (both information regarding pervasiveness of discrimination were given to the participant).
19. 82 – lost HR during baseline
20. 86 – lost ICG during SPD
21. 89 – lost ICG baseline
22. 132 – lost dz/dt during SPD
23. 141 – lost ECG during baseline
24. 150 – lost ICG during Prep and Baseline
25. 154 – $Z(t)$ was flat, thus, unable to be scored
26. 166 – wavy dz/dt and flat $z(t)$, thus, unable to be scored
27. 181 – unreliable ICG and ECG
28. 201 – unstable ICG
29. 202 – Wavy and flat $Z(t)$
30. 204 – Lost dz/dt during Prep
31. 214 – BP disconnection and inconsistency, Wavy and flat $Z(t)$, thus, unable to be scored
32. 219 – 5 minutes baseline was not recorded
33. 229 – This participants took part in the study twice. The data from the first time was included, however, the data from the second time was excluded.
34. 236 – this participant did not talk during SPD task
35. 242 – BP disconnection, lost ECG

C.7 Debriefing Form

C.7.1 Discrimination Debriefing Form

Thank you for taking part in this study. Your participation is very important to us. This sheet explains a little more about the goals of this study and what we expect to find.

The aim of this study is to investigate the consequences of the attributions people make when they receive a negative outcome. We expect to find that attributing a negative outcome to gender discrimination is threatening to the extent that gender discrimination is perceived as *stable*. We expect that attributing a negative outcome to discrimination will be a lot less threatening when discrimination is perceived to be *rare* (or unstable). To investigate this, it is

important that participants receive a negative outcome and attribute it to either stable or rare discrimination. This is why we asked you to engage in a mock job interview and in that interview you were rejected by the interviewer. In reality, this interview was not real—there was no real interview, so the feedback you received was all pre-prepared. All participants in this study received the same negative feedback. In addition, you were randomly assigned to one of two conditions in which you either read an article describing gender discrimination as stable or as rare in British society. This article was also not a real article, it was written by us with the intention to influence your perception of the pervasiveness of gender discrimination.

Although this was a little deceitful, we hope you understand why experimental research has to follow this type of procedure and we sincerely appreciate your willingness to participate. Additionally, it is important that you know the results of this study help us improve our understanding regarding people's physical and psychological states when they are rejected due to discrimination.

As we said before, your responses to this study are completely anonymous and confidential. We ask you to keep the details of this study confidential and not discuss it with your colleagues, so that they can also participate in the study. Thank you for your cooperation in this study. In case you want to know more about this project please do not hesitate to contact Melika Janbakhsh at mj268@exeter.ac.uk.

If you have any complaints about the study, please contact my supervisor Prof Barreto at m.barreto@exeter.ac.uk or the chair of the Psychology ethics committee Dr Kurz at t.kurz@exeter.ac.uk.

C.7.2 Discrimination Debriefing Form

Thank you for taking part in this study. Your participation is very important to us. This sheet explains a little more about the goals of this study and what we expect to find.

The aim of this study is to investigate the consequences of the attributions people make when they receive a negative outcome. We expect to find that attributing a negative outcome to lack of ability is threatening to the extent that ability is perceived as *stable*. We expect that attributing a negative outcome to lack of ability will be a lot less threatening when ability is perceived to be *malleable*. To investigate this, it is important that participants receive a negative outcome and attribute it to either stable or malleable lack of ability. This is why we asked you to engage in a mock job interview and in that interview you were rejected by the interviewer. In reality, this interview was not real—there was no real interview, so the feedback you received was all pre-prepared. All participants in this study received the same negative feedback. In addition, you were randomly assigned to one of two conditions in which you either read an article describing ability as stable or as malleable. This article was also not a real article, it was written by us with the intention to influence your perception of the malleability of ability.

Although this was a little deceitful, we hope you understand why experimental research has to follow this type of procedure and we sincerely appreciate your willingness to participate. Additionally, it is important that you know the results of this study help us improve our understanding regarding people's physical and psychological states when they are rejected due to lack of ability.

As we said before, your responses to this study are completely anonymous and confidential. We ask you to keep the details of this study confidential and not discuss it with your colleagues, so that they can also participate in the study. Thank you for your cooperation in this study. In the case you want to know more about this project please do not hesitate to contact Melika Janbakhsh at mj268@exeter.ac.uk. If you have any complaints about the study, please contact my supervisor Prof Barreto at m.barreto@exeter.ac.uk or the chair of the Psychology ethics committee Dr Kurz at t.kurz@exeter.ac.uk.

**Appendix D: Full wording of Informed Consent, Manipulations, Questionnaires, and
Debriefing form of Study 4 (Chapter 7)**

D.1 Informed Consent

Informed Consent

This study involves two separate and unrelated studies: A short study in the beginning and another study afterwards. In total we expect these studies take approximately 20 minutes.

The first study aims to understand how people process information and in how much detail. For this, you will read two articles and answer a few questions about them. The second study, aims to understand people's professional experiences, so it will involve questions about your work life.

Taking part in this study is completely voluntary and you can quit at any time. All responses are anonymous and confidential. There are no individual results of this research — we will only look at responses at an aggregate level.

This study was approved by the School of Psychology Ethics Review. If you have any further questions about this study please contact Melika Janbakhsh at mj268@exeter.ac.uk (PhD student supervised by Prof. Manuela Barreto, School of Psychology, University of Exeter).

If you agree to take part in this study, please indicate your agreement by clicking the box and press next. Thank you in an advance for you collaboration.

I have read this information and agree to participate in this study

D.2 Manipulations of Stability of Discrimination

Efforts to reduce discrimination against women have been successful

Substantial efforts have been made by individuals, companies, and governments to reduce gender discrimination, for example in the workplace, and this has yielded successful results. According to a recent study published in this journal in December 2015, discrimination against women has decreased in the last 10 years and there are good reasons to expect that this will continue improving in the future (Wegner, Plaut, & Jackson, 2015). The researchers argue that this is in part because these efforts have succeeded in substantially reducing institutionalized discriminatory practices. But, they add, it is also because these efforts have increased awareness of gender discrimination making it easier to detect, control, and address discrimination, both by potential perpetrators and by potential targets. As a result, the gender pay gap, the proportional representation of women in leadership positions, and gender stereotypes about leaders, are today significantly less prevalent than they were 20 years ago. These data suggest that gender discrimination can be fought successfully: Our society is changing to become a more equal environment for all.

Efforts to reduce discrimination against women have not been successful

Substantial efforts have been made by individuals, companies, and governments to reduce gender discrimination, for example in the workplace, but it has remained persistent. According to a recent study published in this journal in December 2015, discrimination against women has remained unchanged in the last 10 years and there are good reasons to expect that it will remain unchanged in the future (Wegner, Plaut, & Jackson, 2015). The researchers argue that this is in part because gender discrimination is often the result of institutionalized practices that are hard to change. But, they add, it is also because gender discrimination is expressed in very subtle and insidious ways that are virtually impossible to detect, control, or address both by perpetrators and by victims themselves. As a result, the gender pay gap, the proportional representation of women in leadership positions, and gender stereotypes about leaders, are as prevalent today as they were 20 years ago. These data suggest that gender discrimination is unlikely to change: It seems to be ingrained in our society's structure and deeply seated in individuals' minds.

D.2.1 Manipulation Checks for Stability of Discrimination

How clear do you think this text is? (That is, how well do you understand the key point of the article?)

1	2	3	4	5	6	7
Not at all						Very much

To what extent do you think that the key point made in the article is well argued?

1	2	3	4	5	6	7
Not at all						Very much

According to the article, has gender discrimination against women in the workplace declined, increased, or remained the same in the last 10 years?

1	2	3
Declined	Increased	Remained the same

To what extent do you think that gender discrimination is now less prevalent than it was 20 years ago?

1	2	3	4	5	6	7
Not at all						Very much
						much

To what extent do you think that that gender discrimination will continue to be reduced in the future?

1	2	3	4	5	6	7
Not at all						Very

D.3 Manipulation of Stability of Ability

The nature of ability: Keep working on it

A recent study indicates that people's basic abilities are quite malleable and can improve over the life course (McClain, Fischer, Dudley & Reed, 2015). This study, which was published in this journal in August 2015, measured the abilities of a large sample of individuals from a variety of socio-economic backgrounds who are representative of the British population. The researchers measured a range of basic cognitive abilities (e.g., reasoning style) that are fundamental for a large number of occupations and professional roles. Measures were taken with well validated tests (such as the VVQ by Mayer & Massa, 2003) every year over a period of 10 years. The results showed that there was an improvement in basic cognitive abilities across time (see Figure 1). In other words, the level of ability that participants demonstrated in the beginning of the study was significantly lower than the level of the same ability observed 10 years later: There was evidence for considerable improvement over the years. Factors such as learning, effort made in the task, type of strategy used when working on a task, type of test, the environment where the test is taken, mood, or health state on the day of the test had large and significant effects on participants' performance. The researchers concluded that one's ability to do well in many important domains is open to change across one's lifetime. It follows that if you are not doing well at something, then this does not mean that you cannot do better in the future. According to the researchers, these findings suggest that it is important to identify what one is struggling with and figure out the strategies and conditions that one requires to fulfil one's potential. When it comes to ability, it's simple: Keep working on it.

The nature of ability: You either have it or you don't

A recent study indicates that people's basic abilities are quite fixed and do not improve over the life course (McClain, Fischer, Dudley & Reed, 2015). This study, which was published in this journal in August 2015, measured the abilities of a large sample of individuals from a variety of socio-economic backgrounds who are representative of the British population. The researchers measured a range of basic cognitive abilities (e.g., reasoning style) that are fundamental for a large number of occupations and professional roles. Measures were taken with well validated tests (such as the VVQ by Mayer & Massa, 2003) every year over a period of 10 years. The results showed that there was little change in basic cognitive abilities across time (see Figure 1). In other words, the level of ability that participants demonstrated in the beginning of the study was very similar to the level of the same ability observed 10 years later: No improvement could be detected over the years. Factors such as learning, effort made in the task, type of strategy used when working on a task, type of test, the environment where the test is taken, mood, or health state on the day of the test had only very small and rather insignificant effects on participants' performance. The researchers concluded that one's ability to do well in many important domains is shaped in early adulthood and is highly resistant to change across one's lifetime. It follows that if you are talented at something, you are likely to remain good at it. However, you are unlikely to become any better at the things you are not so talented at. According to the researchers, these findings suggest that it is important to realize what one is naturally brilliant at and stick to it. When it comes to ability, it's simple: You either have it or you don't!

D.3.1 Manipulation Checks for Stability of Ability

How clear do you think this text is? (That is, how well do you understand the key point of the article?)

1	2	3	4	5	6	7
Not at all						Very much

To what extent do you think that the key point made in the article is well argued?

1	2	3	4	5	6	7
Not at all						Very much

Did the study described in this article show that participants' abilities improved, got worse, or stayed the same after 10 years?

1	2	3
Got worse	Stayed the same	Improved

All in all, to what extent do you think that one's basic cognitive abilities (such as reasoning style) can be changed across one's life?

1	2	3	4	5	6	7
Cannot change at all						Can change very much

To what extent do you think that one can improve one's performance on tasks that involve these basic cognitive?

D.4 Survey

D.4.1 General checks

For this second study we are interested in your current experiences at work.

1. What is your occupation? If you have more than one job, please name the one which is most important to you.

(open question)

2. To what extent do you enjoy your work?

Not at all 1 2 3 4 5 6 7 **very much**

3. How good do you think you are at the work you do?

Not good at all 1 2 3 4 5 6 7 **very good**

4. How good do you think you are at your job, in comparison with your colleagues? Please respond using the slider below. (This is going to be a slider).

bottom 10 % bottom 20% bottom 30% bottom 40% average (50%)

top 40% top 30% top 20% top 10%

D.4.2 Attributions for Setback

Next we would like you to think about the **setbacks** that you have recently experienced at work.

Everyone has setbacks at work, even when things are generally going well. We are interested in the setbacks you may have experienced in the last two months. If you think about the last two months, how frequently do you feel that you have experienced setbacks?

Never Rarely Occasionally Sometimes Frequently Usually

Very frequently

If you consider your setbacks, overall, what do you think has caused them?

[Not at all 1 2 3 4 5 6 7 very much]

1. I think my setbacks were generally due to not having enough ability at the tasks I had to perform.
2. I think my setbacks were generally due to not being sufficiently good at what I was asked to do.
3. I think my setbacks were due to bad luck.
4. I think my setbacks were due to chance occurrences.
5. I think my setbacks were due to other people's negative attitudes about my ethnicity.
6. I think my setbacks were due to disadvantaged treatment I received because of my ethnicity.
7. I think my setbacks were due to other people's negative attitudes about my socio-economic class.
8. I think my setbacks were due to disadvantaged treatment I received because of my socio-economic class.
9. I think my setbacks were due to other people's negative attitudes about my gender group.
10. I think my setbacks were due to disadvantaged treatment I received because of my gender.

If you had to pick the **main cause** of the majority of your setbacks of the last two months, what would it be?

1. Lack of ability
2. Bad luck
3. Negative attitudes towards your ethnic group

4. Negative attitudes towards your socio-economic group
5. Negative attitudes towards your gender group

Now please focus on one **specific** setback experienced in the last two months. Please pick the one that is most salient in your mind when you think about your setbacks at work. Please provide a brief description of this setback.

[open answer]

What do you think was the **main cause** of this setback?

1. Lack of ability
2. Bad luck
3. Negative attitudes towards your ethnic group
4. Negative attitudes towards your socio-economic group
5. Negative attitudes towards your gender group

D.4.3 Emotions for setbacks

Please think again about your overall setbacks of the last two months. How do you feel about them?

Not at all 1 2 3 4 5 6 7 Very much

1. When I think about my successes, I feel ANXIOUS.
2. When I think about my successes, I feel THREATENED.
3. When I think about my successes, I feel CALM.
4. When I think about my successes, I feel RELAXED.
5. When I think about my successes, I feel DISCOURAGED.
6. When I think about my successes, I feel DEMOTIVATED.
7. When I think about my successes, I feel CONFIDENT.

8. When I think about my successes, I feel **EXCITED**.
9. When I think about my successes, I feel **PROUD**.
10. When I think about my successes, I feel **HAPPY**.

D.4.4 Attributions for Success

Next we would like you to consider the **successes** you have experienced at work. Even when we think things are not going well, we all experience some successes. We are interested in how you feel about the successes you may have experienced in the last two months. If you think about the last two months, how frequently do you feel that you have experienced successes?

Never Rarely Occasionally Sometimes Frequently Usually
 Very frequently

If you consider them, overall, what do you think has caused these successes?

[Not at all 1 2 3 4 5 6 7 very much]

If you consider them, overall, what do you think has caused these successes?

1. I think my successes were generally due to having enough ability at the tasks I had to perform.
2. I think my successes were generally due to being good at what I was asked to do.
3. I think my successes were due to good luck.
4. I think my successes were due to chance occurrences.
5. I think my successes were due to other people's positive attitudes about my ethnicity.
6. I think my successes were due to advantaged treatment I received because of my ethnicity.
7. I think my successes were due to other people's positive attitudes about my socio-economic class.

8. I think my successes were due to advantaged treatment I received because of my socio-economic class.
9. I think my successes were due to other people's positive attitudes about my gender group.
10. I think my successes were due to advantaged treatment I received because of my gender.

If you had to pick the **main cause** of the majority of your successes of the last two months, what would it be?

1. Sufficient ability
2. Good luck
3. Positive attitudes towards your ethnic group
4. Positive attitudes towards your socio-economic group
5. Positive attitudes towards your gender group

Now please focus on one **specific** success experienced in the last two months. Please pick the one that is most salient in your mind when you think about your successes at work. Please provide a brief description of this success.

[open answer]

What do you think was the **main cause** of this success?

1. Sufficient ability
2. Good luck
3. Positive attitudes towards your ethnic group
4. Positive attitudes towards your socio-economic group
5. Positive attitudes towards your gender group

D.4.5 Emotions for Success

Please think again about your overall successes of the last two months. How do you feel about them?

Not at all 1 2 3 4 5 6 7 Very much

1. When I think about my successes, I feel ANXIOUS.
2. When I think about my successes, I feel THREATENED.
3. When I think about my successes, I feel CALM.
4. When I think about my successes, I feel RELAXED.
5. When I think about my successes, I feel DISCOURAGED.
6. When I think about my successes, I feel DEMOTIVATED.
7. When I think about my successes, I feel CONFIDENT.
8. When I think about my successes, I feel EXCITED.
9. When I think about my successes, I feel PROUD.
10. When I think about my successes, I feel HAPPY.

D.4.6 Setback Caused by Lack of Ability

Next, we would like you to think of a recent **setback** you experienced at work, in the last two months, and that you think was **due to you not having the required ability** for a particular task. Can you recall a setback of this kind?

Yes No

D.4.6 Emotions for setback caused by lack of ability

If yes, please tell us how this makes you feel:

Not at all 1 2 3 4 5 6 7 **Very much**

1. When I think about my successes, I feel ANXIOUS.

2. When I think about my successes, I feel THREATENED.
3. When I think about my successes, I feel CALM.
4. When I think about my successes, I feel RELAXED.
5. When I think about my successes, I feel DISCOURAGED.
6. When I think about my successes, I feel DEMOTIVATED.
7. When I think about my successes, I feel CONFIDENT.
8. When I think about my successes, I feel EXCITED.
9. When I think about my successes, I feel PROUD.
10. When I think about my successes, I feel HAPPY.

D.4.7 Setback Caused by Gender Discrimination.

Finally, we would like you to think of a recent **setback** you experienced at work, in the last two months, and that you think was **due to another person's negative attitudes towards your gender group**. Can you recall a setback of this kind?

Yes No

D.4.6. Emotions for setback caused by gender discrimination

If so, please tell us how this makes you feel:

Not at all 1 2 3 4 5 6 7 **Very much**

1. When I think about my successes, I feel ANXIOUS.
2. When I think about my successes, I feel THREATENED.
3. When I think about my successes, I feel CALM.
4. When I think about my successes, I feel RELAXED.
5. When I think about my successes, I feel DISCOURAGED.
6. When I think about my successes, I feel DEMOTIVATED.

7. When I think about my successes, I feel CONFIDENT.
8. When I think about my successes, I feel EXCITED.
9. When I think about my successes, I feel PROUD.
10. When I think about my successes, I feel HAPPY.

D.4.8 Demographic questions

Before we end, please provide some demographic information about yourself:

What is your age? (open)

What is your gender? (open)

What is your nationality? (open)

How would you describe your ethnicity? (open)

Think of this ladder as representing where people stand in the UK. At the top of the ladder are people who are best off – those who have the most money, the most education, and the most respected jobs. At the bottom are people who are the worst off – who have the least money, the least education, and the least respected jobs or no job. The higher up you are on this ladder the closer you are to the people at the very top; the lower you are, the closer you are to the people at the bottom. Can you please indicate where you would place yourself on this ladder?



Thank you for taking part in this study.

D.5 Debriefing Form

Debriefing

Thank you for taking part in this study. Your participation is very important to us. This document explains a little more about the goals of this study and what we expect to find.

The aim of this study is to investigate the circumstances in which people attribute a negative outcome to lack of ability and to discrimination. We expect to find that stability of these attributions can play an important role in this process. That is, we expect that people are less likely to attribute a negative outcome to a cause that they believe is stable (i.e., that is unlikely to improve) than to a cause that can change. This is because stable causes are more threatening, since they are likely to continue causing negative outcomes in the future.

To investigate this, it is important that participants focus on a setback they have had and attribute it to either ability or discrimination, in conditions where these are either perceived as stable or as unstable. You were randomly assigned to one of four groups and read two out of four articles. These articles served as manipulation and provided you with information regarding stability of discrimination (pervasive vs. rare) and of ability (fixed vs. flexible). Afterwards, we asked you to think of your setbacks and attribute it to one or another. The articles we gave you to read are not real articles—they were written by us to try and influence your views, so that we could research the effects of such views.

Although this was a little deceitful, we hope you understand why some research has to follow this type of procedure and we sincerely appreciate your willingness to participate. Additionally, it is important that you know the results of this study help us to improve our understanding regarding the circumstances under which people make different types of attributions for negative outcomes.

It is important to reiterate that your responses to this study are completely anonymous and confidential. We ask you to keep the details of this study confidential and not discuss it with your colleagues so that they can also participate in the study. Thank you for your cooperation. In case you want to know more about this project please do not hesitate to contact Melika Janbakhsh at mj268@exeter.ac.uk.

Comparing attributions to ability for setback and success.

To compare attributions to ability for setback and success, we conducted a 2 (stable vs. unstable ability) x 2 (stable vs. unstable discrimination) x 2 (Attributions to ability: Setback vs. Success) multivariate ANOVA with repeated measure on the last factor. The results indicate a significant effect of type of event type, $F(1, 154) = 431.61, p < .001, \eta^2_p = .737$. This indicated that participants made more attributions to ability for their success ($M = 5.96, SD = 1.09$) than their setbacks ($M = 2.56, SD = 1.48$). However, there was a trend for simple main effect of stability of ability, $F(1, 154) = 2.68, p = .103, \eta^2_p = .017$. This indicated that participants in the stable ability condition ($M = 4.36, SD = .78$) made more attributions to ability (for both setback and success) than participants in the unstable ability condition ($M = 4.15, SD = .81$).

There were no other significant interactions: Main effect of stability of discrimination, $F(1, 154) = 0.29, p = .589, \eta^2_p = .002$, interaction between stability of discrimination and of ability, $F(1, 154) = 0.19, p = .660, \eta^2_p = .001$, interaction between stability of ability and event type, $F(1, 154) = .55, p = .457, \eta^2_p = .004$, interaction between event type and stability of discrimination, $F(1, 154) = 2.06, p = .153, \eta^2_p = .013$, and three way interaction, $F(1, 154) = .02, p = .893, \eta^2_p < .001$.

Comparing attributions to gender-based treatment for setback and success.

To compare attributions to gender-based treatment for setback and success, I conducted a 2 (stable vs. unstable ability) x 2 (stable vs. unstable discrimination) x 2 (Attributions to gender –based treatment: setback vs. success) multivariate ANOVA with repeated measures on the last factor. The results indicate a significant effect of event type, $F(1, 153) = 4.55, p = .035, \eta^2_p = .029$: participants tend to make more attributions for gender-based treatment for their setbacks ($M = 1.85, SD = 1.34$) than for success ($M = 1.59, SD = 1.21$). Also, the main effect of stability of ability was marginally significant, $F(1, 153) = 3.74, p = .055, \eta^2_p = .024$. This indicated that participants in the stable discrimination condition ($M = 1.88, SD = 1.21$) made

more attributions to gender-based treatment (for both setback and success) than participants in the unstable discrimination condition ($M= 1.56, SD= .77$).

No other significant results were found: Main effect of stability of ability, $F(1, 153) = 1.59, p = .210, \eta^2_p = .010$, interaction between stability of ability and stability of discrimination, $F(1, 153) = 0.68, p = .411, \eta^2_p = .004$, interactions between event type with stability of ability, $F(1, 153) = 1.17, p = .281, \eta^2_p = .008$, interaction between event type with stability of discrimination, $F(1, 153) = 1.29, p = .258, \eta^2_p = .008$, and three way interaction between the event type, stability of ability of discrimination, $F(1, 153) = 1.91, p = .169, \eta^2_p = .012$.

Appendix E Alternative analyses for self-reports

In chapter 5 (studies 2a and 2b), data from participants who had to be excluded from the analyses of psychophysiological data, were excluded from the analysis of self-reported data too. In this section, I report analyses of all available the self-reported data.

E.1 Experiment 2a

In this study three participants were excluded from the self-reported data: Two due failure in camera recording and one due to no variability in responses. Thus, the analyses were conducted on the remaining 70 participants (35 participants in the pervasive condition which is 50% of the total sample size, and 35 in the rare discrimination condition which includes 50% of the total sample size).

Manipulation checks. The results from the univariate test indicated no significant effect of condition difference on manipulation check, $F(1, 68) = .41, p = .524, \eta^2_p = .006$.

Attributions. A 2 (Pervasive vs. Rare Discrimination) x2 (Attributions to lack of Ability vs. Discrimination) MANOVA with repeated measures on the last factor indicated no significant effect of pervasiveness on attributions, $F(1, 68) = .05, p = .823, \eta^2_p = .001$, no significant effect of type of attributions, $F(1, 68) = 3.48, p = .067, \eta^2_p = .049$, and no significant interaction between pervasiveness and type of attributions, $F(1, 68) = 3.48, p = .067, \eta^2_p = .049$.

Emotions before 5-minutes recovery period. To test effects of pervasiveness on emotions (Hypotheses a and b) I conducted a 2(Pervasive vs. Rare Discrimination) x2 (Emotions: Threat vs. Challenge) MANOVA with repeated measures on the last factor. This analysis revealed no significant main effect of pervasiveness, $F(1, 68) = .94, p = .335, \eta^2_p = .014$, no significant main effect of type of emotions, $F(1, 68) = 1.78, p = .186, \eta^2_p = .026$, and no significant interactions between pervasiveness and type of emotions, $F(1, 68) = .96, p = .332, \eta^2_p = .014$.

Emotions after 5 minutes recovery period. To examine effects of pervasiveness on emotions after the recovery period I ran a 2(Pervasive vs. Rare Discrimination) x2 (Emotions: Threat vs. Challenge) MANOVA with repeated measures on the last factor. This test indicated a significant effect of type of emotion, $F(1, 68)= 68.58, p < .001, \eta^2_p = .502$. This indicate that in total participants significantly reported more challenge ($M= 4.62, SD= 1.06$) than threat ($M= 2.69, SD= 1.16$) after the recovery period. This test revealed no other significant effects: Main effect of pervasiveness, $F(1, 68)= 2.16, p= .146, \eta^2_p = .031$, and no significant interaction between pervasiveness and type of emotions, $F(1, 68)= 1.69, p= .198, \eta^2_p = .024$.

E.2 Experiment 2b

In this study only one participant was excluded from the self-reported data which was because 5 minutes baseline was not recorded. Thus, the analyses were conducted on the remaining 65 participants (32 participants in the fixed condition which is 49.2% of the total sample size, and 33 in the malleable ability condition which includes 50.8% of the total sample size).

Manipulation checks. The result from a univariate analysis of variance indicated a significant effect of stability on manipulation checks, $F(1, 63)= 6.19, p= .015, \eta^2_p = .090$, indicating that participants in the malleable condition ($M= 2.67, SD= 1.27$) indicated ability to be more changeable than participants in the fixed ability condition ($M= 3.48, SD= 1.36$). This confirms that the manipulation of stability of ability was successful.

Attributions. A 2(Pervasive vs. Rare Discrimination) x2 (Emotions: Threat vs. Challenge) MANOVA with repeated measures on the last factor was conducted to test the effects of stability on attributions. This analyses revealed a significant main effect of type of attributions, $F(1, 63)= 82.63, p < .001, \eta^2_p = .567$, indicating that, as intended, participants made more attributions to lack of ability ($M= 5.07, SD= 1.56$) than to discrimination ($M= 2.44, SD=$

1.45). No other significant effect was detected: Main effect of stability, $F(1, 63) = .03, p = .872, \eta^2_p < .001$, no significant interaction between stability and type of attributions, $F(1, 63) = 1.30, p = .259, \eta^2_p = .020$.

Emotions before 5-minutes recovery period. To test the effects of stability on type of emotions before the 5-minute recovery (Hypotheses a and b), I conducted a 2 (Stability: Stable vs. Unstable) x 2 (Emotions: Threat vs. Challenge) MANOVA with repeated measure on the last factor. This analysis revealed a significant interaction between types of emotions and stability, $F(1, 63) = 5.90, p = .018, \eta^2_p = .086$. Simple main effect revealed that participants in the unstable condition significantly reported more threat than those in the stable condition, $F(1, 63) = 5.72, p = .020, \eta^2_p = .083$. However, there is no significant difference in reported challenge, $F(1, 63) = 3.95, p = .051, \eta^2_p = .059$. There was no other significant results were detected: Main effect of type of emotions, $F(1, 63) = .11, p = .745, \eta^2_p = .002$, and no significant main effect of stability, $F(1, 63) = .30, p = .584, \eta^2_p = .005$.

Emotions after 5-minutes recovery period. A 2 (Stability: Stable vs. Unstable) x 2 (Emotions: Threat vs. Challenge) MANOVA with repeated measure on the last factor was conducted to test effect of stability on emotions after the recovery period. This analysis revealed a significant effect of type of emotions, $F(1, 63) = 45.41, p < .001, \eta^2_p = .419$, indicating that participants reported more challenge ($M = 4.39, SD = 1.18$) than threat ($M = 2.72, SD = 1.03$) after the recovery period. No other effect was indicated: Main effect of stability, $F(1, 63) = .72, p = .401, \eta^2_p = .011$, and no interaction between type of emotions and stability, $F(1, 63) = .36, p = .550, \eta^2_p = .006$.

Helplessness before vs. after the recovery period. A 2 x 2 MANOVA on feelings of helplessness before and after the recovery (with time varied within participants) indicated a significant effect of time, $F(1, 63) = 5.27, p = .025, \eta^2_p = .077$, indicating that participants

reported less helpless after ($M= 2.38, SD= 1.67$) compared to before ($M= 2.80, SD= 1.65$) the recovery period. This analysis reveal no other significant effect: Main effect of stability, $F(1, 63)= 3.45, p=.068, \eta^2_p = .052$, and no significant interaction between time and stability, $F(1, 63)= .32, p=.576, \eta^2_p = .005$.