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Does awareness matter? Conscious vs unconscious stereotype activation and its impact on self-assessment, social experience and speech behavior of older adults

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Abstract

Background. *Stereotype threat* is a widely researched phenomenon, including research about old age stereotypes. While the bulk of research has focused on the impact on performance measures, the impact on self-assessment, behavior and social experiences has also been gaining interest. Various different methods to induce stereotype threat exist and have been used in research. These methods differ in effect size but may also create effects which differ in other ways. The *multi-threat framework* is a first theoretical attempt to differentiate between these effects, by categorizing according to the source and target of the threat. A neglected factor may be the level of awareness of the threat. It is hypothesized that implicit and explicit stereotype activation can produce effects, which not only differ in degree, but in direction, because conscious awareness of the stereotype can lead to contrast effects, whereas unconscious activation leads to assimilation effects. Because of the *stereotype matching effect*, the impact is expected to be strongest in outcomes closely related to the material used to induce the threat. Attitudes regarding old age, which people have already internalized, may moderate this effect. Age and education are considered as additional influences on the outcomes.

Method. The sample consisted of $N = 128$ individuals (51 men, 77 women) between 59 and 94 years of age ($M = 70.35$ years). This was a between-subjects design with an explicit, a semi-explicit and an implicit experimental group, as well as one control group. The independent variable was the experimental condition. The dependent variables were two composite variables based on a variety of questionnaires, one centering around self-assessment, the other around social experience. In addition, four speech behavior-based outcomes were considered. An identification task was rated for valence and used for a moderator analysis.

Results. Self-assessment showed significant effects with the predicted pattern of assimilation vs. contrast, whereas social experience showed only the predicted pattern, but no statistical significance. The speech-based outcomes generally lacked statistical significance, but still aided the interpretation of the overall findings. No evidence of moderation was found. Age and education were affirmed as important factors to consider in research of this kind.

Conclusions. Although the results were more subtle and nuanced than expected, stereotype awareness seems to be an important factor in the effect produced by manipulations. Stereotype threat may not be a singular phenomenon but one consisting of several

subcategories that differ in subtle ways. Future research should further investigate the implications of this finding.

Keywords: stereotype threat, old age stereotypes, multi-threat framework, implicit vs. explicit manipulation

Introduction

“We are told about the world before we see it. We imagine most things before we experience them. And those preconceptions, unless education has made us acutely aware, govern deeply the whole process of perception”, journalist Walter Lippman wrote in his work *Public Opinion* (1922/1998, p.90). Lippmann coined and popularized the term *stereotype* to describe this phenomenon, which has since garnered much interest in the field of psychology. For our purposes a stereotype can be defined as generalized beliefs about a group of people and hence the people belonging to that group. While the term stereotype has negative connotations, stereotypes are not necessarily something nefarious and their emergence seems to be an unavoidable and “natural” aspect of the way the human mind works. McGarty et al. (2002) put it thusly:

People form stereotypes to make sense of the world they live in. The things that they tend to make sense of are relations between groups that they encounter, interact with and are dependent on. Perceivers are intent on producing these understandings because they need this knowledge to understand the world and to take and coordinate action.
(p. 198)

Stereotypes exist to reduce the complexity of the world we encounter, “(a) stereotypes are aids to explanation, (b) stereotypes are energy-saving devices, and (c) stereotypes are shared group beliefs” (McGarty et al., 2002, p.2). Stereotypes therefore have a useful role for the people that hold them. There is however another aspect to consider, namely the effect stereotypes have on the people that are stereotyped. This effect can unfortunately often be detrimental, and its study has drawn much attention, ever since Steele and Aronson (1995) used it to explain the underperformance of African American students on a standardized test. This phenomenon has since been known as *stereotype threat* and has been demonstrated to exist in a multitude of studies for many different groups (Pennington et al., 2016) often with negative consequences for the people affected by it. While the content of stereotypes about people may be challenged in the sociopolitical sphere, their existence itself seems to be unavoidable. It can be argued that, in an increasingly complex, globalized, and diverse world, their relevance and hence their impact may only increase. It is therefore of growing importance to understand the harmful impact stereotypes can have on people, to understand the mechanisms underlying this impact, to figure out ways to protect people from it and to devise ways to counteract the harm. While this would already be reason enough, this phenomenon does not only affect a few people belonging to marginalized groups, as “Every individual is potentially vulnerable to stereotype threat, because every individual has at least

one social identity that is targeted by a negative stereotype in some given situation” (Spencer et al., 2016, p. 417).

The present research hopes to make a small contribution to our understanding of stereotype threat by focusing specifically on stereotypes about older adults and the way stereotypes are presented to them. For this purpose, negative old age stereotypes have been presented to individual older adults in either blatant or more subtle ways. The impact of these different stereotype manipulations on two composite outcomes based on questionnaire responses has been measured. Additionally, the recollection of a social interaction has been analyzed in order to better understand the impact of different forms of stereotype threat.

Theoretical Background and Hypotheses

Stereotypes About Older Adults

Society is rife with stereotypes and stereotypes about older people are no exception. While there exists a cultural context for stereotypes, the content and prevalence of stereotypes about older adults seems to be fairly consistent across nations and cultures. For instance, Cuddy et al. (2005) found in their study that stereotypes about older adults remained consistent across diverse cultures, as evidenced by data from six non-U.S. countries, including three collectivist cultures. Stereotypes are not necessarily only negative, and the stereotypical conception of older adults is typically mixed, as “mainstream society stereotypes elderly people as warm (positive), but also as incompetent” (Cuddy et al., 2005, p.268). This is not to say, that the positive and negative stereotypes are equally matched. To demonstrate this research by Ng (2021) may be pointed to, which shows that negative descriptions of older adults in print media outnumber positive ones by six to one, with negative descriptions generally centering around physical and cognitive decline. While Ng’s analysis was focused on the American and British cultural landscape it seems plausible to assume that similar sentiments dominate in Austria, where the present research has been conducted. These stereotypes can have serious consequences for the people affected by them. Considering that negative old age stereotypes mostly center around concepts like loss or decrease of function and competence, most research has been focusing on the effect of stereotype threat on physical and/or cognitive performance, with many studies finding significant effects (Vailati Riboni & Pagnini, 2021). A study by Hess et al. (2003), for example, found that older adults who were exposed to negative stereotypes about aging had lower memory performance than those who were not exposed to such stereotypes, a finding also confirmed by Hess, Emery and Queen (2009).

Particularly concerning are the documented effects of negative old age stereotypes and their internalization on various health outcomes. Stereotypes and ageism can increase the risk of cardiovascular disease (Levy, 2009) and lead to lower levels of self-esteem, less satisfaction with life and shorter life expectancy (Levy et al., 2002) and can even adversely affect the will to live (Levy et al., 2000). The consequences of stereotypes are not just felt by those directly affected, but the increased prevalence of health problems can also drive-up costs in the health care system (Levy et al., 2020). Less attention has thus far been paid to the social experiences and behavior of older adults, although some studies have investigated this connection and found significant effects as well (Cheng, 2020).

Given this gap, this research seeks to contribute to the understanding of the impact stereotype threat has on self-perception and behavior of older adults within a social context. Considering that the exposure to old age stereotypes can alter people's self-esteem or impact people's performance, arguably via heightened anxiety, it seems plausible to assume that social experience can be impacted as well. Self-esteem is affectively laden and thus subject to change, when affect changes. It also has social connotations, as Leary and Baumeister (2000) put it: "self-esteem is related more strongly to perceptions of others' evaluations of oneself than to seemingly objective indicators of one's ability or goodness" (p.2).

In addition, self-esteem has been shown to impact, among other things, the trajectory of relationships and job satisfaction (Orth et al., 2012). The level of anxiety may also impact how we view ourselves and our relationships. A heightened health anxiety was shown by Cheng (2020) to at least coincide with a more negative view of aging and less satisfaction with family support after being exposed to negative old age stereotypes. Taken together, there seems to be broad evidence to suggest that older adults can be impacted by stereotypes and stereotype threat in various ways.

What Exactly Is Stereotype Threat?

The initial formulation of stereotype threat theory is attributed to Claude Steele and Joshua Aronson, who published a seminal article on the topic in 1995. In their research, Steele and Aronson found that African American college students performed worse on standardized tests when the tests were framed as measures of intellectual ability compared to when the tests were framed as non-diagnostic of ability. Since its inception, stereotype threat and its effects have been documented in a wide variety of studies, mostly centered around, but not exclusive to, its negative impact on measures of performance. The effect has been demonstrated for a lot of different groups and performance outcomes, like women and math exams (Spencer et al., 1999), poor people and test performance (Croizet & Millet, 2011) or older adults and memory

performance (Chasteen et al., 2005). There is, however, not yet a clear consensus on how stereotype threat works. In their article, Steele and Aronson argued that the African American students felt pressure to disconfirm negative stereotypes about their group's intellectual ability, which in turn undermined their performance. Stereotype threat can therefore basically be understood as the consequence of a stress response. This view was elaborated upon by Schmader et al. (2008). They argue “that stereotype threat disrupts performance via 3 distinct, yet interrelated, mechanisms: (a) a physiological stress response that directly impairs prefrontal processing, (b) a tendency to actively monitor performance, and (c) efforts to suppress negative thoughts and emotions in the service of self-regulation” (Schmader et al., 2008, p.336). But not everyone views stereotype threat in terms of physiological and psychological stress responses.

In their approach Owens and Massey (2011) would summarize such stress responses under the term *externalization*, which they contrast with another pathway of stereotype threat, they call *internalization*. “Internalization (INT) occurs when minority students themselves buy into the stereotype of intellectual inferiority at some level and come to fear that it may pertain to their own academic abilities” (Owens & Massey, 2011, pp.151-152). Whereas the externalization mechanism decreases performance, because the stress responses deplete resources available for the task to be performed, the internalization mechanism works by changing people’s view of themselves and thus their behavior. Such changes may not only pertain to the specific situation, where the confrontation with the stereotype occurs, but can permanently alter the self-image of the people affected by them. In her work on the effects of old age stereotypes, Levy (2009) refers to this phenomenon as stereotype embodiment, explaining that “stereotypes are embodied when their assimilation from the surrounding culture leads to self-definitions that, in turn, influence functioning and health” (p.332). Given that negative age stereotypes held earlier in life can predict worse health among older individuals (Levy et al., 2012), it seems to be of particular importance to gain a better understanding of how such internalization occurs exactly. The mere confrontation with stereotypes does not appear to be a sufficient condition, as this confrontation can even have the opposite effect of improving people’s view of themselves. Such phenomena are generally referred to as *contrast effects* and summarized under the term resilience theory. Evidence for such contrast effects specifically for old age stereotypes comes from Pinquart (2002). Pinquart argues, that such contrast effects occur, because “older adults use negative age stereotypes more as a standard of reference for downward comparison rather than integrating them into their self-perception” (p.317). Through these examples, we can see that stereotype threat can

affect different groups, function through different pathways and even have effects that differ not only in degree, but in direction. This has led some scholars to argue that stereotype threat is not a singular phenomenon.

Shapiro and Neuberg (2007) summarized this view thusly: “Stereotype threat seems to mean different things to different researchers and has been employed to describe and explain processes and phenomena that appear to be fundamentally distinct” (p.107). In order to clarify the terminology and account for different effects, pathways and moderators, they developed the *multi-threat framework* of stereotype threat, which will be discussed in the following section.

Not All Threats Are Alike – The Multi-Threat Framework

Stereotypes are different so why shouldn't the threats they induce be different as well? This question seems obvious enough, but it took almost a decade until the first attempt to describe these differences in a systematic way was made. One reason might be that in the original study by Steele and Aronson (1995) stereotype threat was used to explain a negative impact on academic performance. Hence, it has been decreases in academic performance on which research around stereotype threat has focused and “given the possibility that qualitatively distinct forms of stereotype threat may elicit similar decrements in test performance, researchers and interventionists interested solely in test performance might question the usefulness of differentiating among these threats” (Shapiro & Neuberg, 2007, p.111). With regards to old age stereotypes, it does seem particularly important to understand the way they are internalized into the self-concept, considering this very internalization can predict health outcomes decades later (Levy, 2009).

The multi-threat framework by Shapiro and Neuberg (2007) categorizes stereotype threat along two dimensions, one being the source (self vs. ingroup vs outgroup) and the other the target (self vs. group) of the threat, resulting in six distinct types of stereotype threat. Since the present research hopes to shed some additional light on the process of internalization of stereotypes, which is defined here as changes in self-perception to align more with the stereotype, it takes a closer look particularly at those threats which have the self as a source. In the model this is called the *self-concept threat*, defined as “Fear that my behavior will confirm, in my own mind, that the negative stereotypes held of my group are true of me” and the *group-concept threat*, defined as “Fear that my behavior will confirm, in my own mind, that that the negative stereotypes held of my group are true of my group” (Shapiro & Neuberg, 2007, p.113). In addition to the particular importance of the self-concept threat, this type of threat also seems most likely to occur in the present research design, as the

model proposes different eliciting conditions for the type of threat which will be activated. Although this research in part looked at outcomes related to the social experience of older adults, the essential eliciting condition for “other-as-source threats” (like the fear of confirming the stereotype in the eyes of another person) is for the stereotype relevant behavior to be visible or at least available to other people (Shapiro & Neuberg, 2007, p.114). Because participants of this research were explicitly informed that the questionnaires they filled out would be anonymized and could later therefore not be traced back to them, it was assumed that other-as-source threats should not occur.

With regards to the different “self-as-source threats” (Shapiro & Neuberg, 2007, p.114), let us consider a situation in which older adults find themselves confronted with negative information about declining competence in old age. It seems difficult to discern whether a person would perceive this as more of a threat to the group they belong to, specifically to themselves, or to both. Examples of eliciting conditions that would differentiate between a group-concept threat and a self-concept threat would be the “need to identify with the group” or “the need to see oneself as representing the group” (Shapiro & Neuberg, 2007, p.115). In her review Barber (2017) tried to apply the multi-threat framework specifically to old age stereotypes. Barber gives an additional reason why self-as-source threats are of a particular importance for old age stereotypes, arguing that “because of their high stereotype endorsement, the multi-threat framework suggests that older adults should be at particular risk for experiencing self-as-source forms of stereotype threat (i.e., self-concept threat and group-concept threat)” (p.67). Given that there is research showing older adults generally have low group identification (Linn & Hunter, 1979), Barber argues that “older adults’ strong endorsement of negative aging stereotypes coupled with their low self-identification with the older adult group should mean that older adults are predisposed to self-concept threat about their cognitive abilities” (p.68). The clear implication is that low self-identification is something preexisting which older adults bring to the situation in which they experience stereotype threat. While this can be true, the following section will explore why this low self-identification could, under certain conditions, also be conceptualized as an active defensive mechanism to protect the self-image from the threat.

Self-Relevance as a Defense Mechanism

Self-relevance is one factor that can moderate the impact of stereotype threat. When a stereotype threat is personally relevant to an individual's sense of identity, the impact of the threat on performance is more significant. This sense of identity can be triggered by situational cues. One study found, for example, that, when women were reminded of their

gender before taking a math test, their performance was negatively impacted (Murphy et al., 2007). However, when they were reminded of their competence before taking the test, their performance improved (Murphy et al., 2007). Given that there is a negative stereotype about women's math ability, specifically reminding them of their gender made the stereotype salient, which induced the threat. In turn, performance was negatively impacted. Another study has found the same effect when reminding older adults about their age before taking a memory test (Hess, Hinson & Hodges, 2009). While the situational cues and the result in these studies were the same, the stereotype threat, seen through the lens of the multi-threat framework, may not have been.

Taken together, older adults' strong endorsement of negative aging stereotypes coupled with their low self-identification with the older adult group mean, that older adults are predisposed to self-concept threat about their cognitive abilities. That is, older adults should be especially concerned with whether stereotypes about age-related senility and declines in cognition have personally affected their own abilities. (Barber, 2017, p.68)

Given that according to Rogers and Meltzoff (2017) gender is much more central to people's identity, a low level of self-identification and therefore a self-concept threat, cannot be assumed for the women in the study by Murphy et al. (2007). This distinction is important, because while the different types of stereotype threat may have the same effect on a performance measure, they can have different moderators, mediators and compensatory strategies and therefore may also necessitate different interventions to ameliorate.

An example of a compensatory strategy proposed by the multi-threat framework for the kind of self-concept threat faced by older adults would be for example to "Distance oneself from or reject the group" (Shapiro & Neuberg, 2007, p.123). We can see this strategy at work in a study by Pinguart (2002). In this study older adults were confronted with negative information about competence in old age while a control group received neutral information. Both groups were asked to assess themselves and their peers before and after they received the information. While there was little change in the control group, peer perception worsened in the experimental group, while self-perception improved. Pinguart concluded, that "older adults use negative age stereotypes more as a standard of reference for downward comparison rather than integrating them into their self-perceptions" (p.317). By widening the gap between self-perception and peer-perception, psychological distance between the self and the group is created and thus the threat to the self-concept is averted, even while the threat to the group is endorsed.

It seems probable, that for such a defense mechanism to be effective, the self-identification with the group ought to be low to begin with, but there may be another eliciting condition, which neither Pinguart (2002) nor the multi-threat framework have considered, namely the level of awareness of the threat. The participants in Pinguart's study were very consciously presented with negative information, which allowed them to actively contrast themselves against said information. While it did not use the exact same outcome measures, a study by Kotter-Grühn and Hess (2012) saw worsening self-perception after the older adults were negatively primed with a more subconscious method. This difference in effect direction might be explicable, because "it could be speculated that high levels of stereotype prime awareness result in contrast effects, whereas low to moderate levels result in assimilation effects" (Kotter-Grühn & Hess, 2012, p.564).

Implicit and Explicit Stereotype Activation

Stereotypes can be presented with varying degree of subtlety, from the blatant explicit presentation of information to subconscious implicit manipulation. The most common form of explicit stereotype activation is via instructions. Prior to performing a task, participants are presented with information, either factual or pertaining to a relevant stereotype, for example reminding people about the negative effect of aging on memory performance before taking a memory test. Manipulation by instruction can also vary by degrees of subtlety. For instance, Abrams et al. (2006) successfully induced stereotype threat in older adults by simply instructing them that the purpose of their study was to exam whether older people indeed performed worse on cognitive tests than younger people. However, the most established type of implicit, that is, subconscious, manipulation is arguably the scrambled sentence task (Bargh et al., 1996).

Research that contrasted these methods of stereotype presentation was primarily concerned with comparing their effect sizes. One review found, that "manipulations by instructions appeared to be more largely used and capable of producing more clear performance variations on cognitive, memory, and physical tasks. Age-related stereotypes showed potentially stronger effects when they are negative, implicit, and temporally closer to the test of performance" (Vailati Riboni & Pagnini, 2021, p.1). The view that negative stereotypes have a greater effect than positive stereotypes is also shared by Meisner (2012), although his review did not find a greater effect for implicit manipulation. Meisner also points out, that "Few studies have investigated implicit and explicit primes together and the influence of prime awareness on behavior warrants further investigation" (p.16), a gap this research hopes to help fill.

One of the few studies, that directly contrasted implicit and explicit stereotype activation methods and their impact on memory performance was done by Hess et al. (2004). The study showed a clear effect for the implicit activation, whereas with “explicit primes, older adults were able to counteract the impact of negative stereotypes when the cues were relatively subtle, but blatant stereotype primes suppressed performance regardless of prime type” (Hess et al, 2004, p.495). The possibility that a greater level of awareness of the threat may allow for different kinds of defense mechanisms to be engaged has already been mentioned above. While a successful defense, as in the study by Hess et al. (2004), may nullify the threat when the outcome is a performance measure, the effect of the defensive strategy can go further when the outcome is a judgment task, as shown in the study by Pinquart (2002). When people are asked to judge themselves, the defense against a stereotype does not only lead to non-assimilation but to an active contrast between themselves and the stereotype they feel threatened by.

Evidence that awareness of the threat may be the crucial determinant comes from outside the field of stereotype threat research, namely from research into social judgement. In their study “Awareness of the Influence as a Determinant of Assimilation Versus Contrast” Strack et al. (1993) showed that participants’ judgment of another person will be either assimilated to or contrasted against previously presented primes (adjectives), dependent on whether participants were explicitly reminded of them. In their review on the topic Bless and Burger (2016) concluded that “extreme rather than moderate primes, blatant rather than subtle priming procedures, and perceptually non-fluent rather than fluent primes were found to elicit contrast effects” as well as that “subliminal priming usually results in assimilation effects because, by definition, the priming episode is outside individuals’ awareness” (p.27).

Taken together, it can be expected, that when older people are presented with negative old age stereotypes and are subsequently asked to judge themselves in categories relevant to the stereotype, assimilation effects are likely to occur when the stereotype is presented implicitly, whereas contrast effects are likely to occur when the stereotype is presented explicitly.

This research tried to test this idea by contrasting three different manipulation methods that differ in their degree of subtlety with which they presented the stereotype. The first condition (also called *information condition*) used an explicit method, which presented stereotype threat inducing information in the form of a podcast. The second condition (also called *instruction condition*) presented it in the form of a multiple-choice quiz. This condition also forced conscious engagement with stereotype threat inducing information, although it

remained ambiguous about the precise content of the information due to the quiz format. It could therefore be considered a semi-explicit manipulation. The third condition used an implicit method, namely a scrambled-sentence task, which is a priming technique that takes advantage of associations within a participant's lexical network. This method is a well-established procedure in stereotype threat research (Vailati Riboni & Pagnini, 2021).

Old Age Stereotype Threat and Specific Outcomes

The bulk of research on old age stereotype threat, as well as research on stereotype threat in general, has focused on measures of performance, primarily cognitive abilities, and memory performance. Old age stereotypes can however also impact self-perception and behavior. This research considered a wide variety of questionnaire and speech behavior-based outcomes, which could plausibly all be affected by old-age stereotypes, although not necessarily to the same degree. These outcomes fall into three categories. The first category can be summarized as outcomes that center around forms of self-assessment. These would specifically be the outcomes self-esteem, satisfaction with basic psychological needs, mental health, physical health, communicative competency, attitudes towards aging and feeling of the past three months. Levy (2009) showed that the internalization of negative age stereotypes has a negative impact on self-esteem. Self-esteem in turn is closely connected to a variety of other constructs, for example the sense of well-being (Heppner et al., 2008), here conceptualized as satisfaction with basic psychological needs. In her work on stereotype embodiment Levy demonstrated that negative stereotypes could have an impact on the self-perception of aging. In their research Moor et al. (2006) found aging self-stereotypes to be an important mediator for subjective health. The belief in one's communicative ability rests on the belief in more foundational cognitive ability (Ryan et al., 1992), a stereotype that shakes the confidence in one's cognitive ability, as old-age stereotypes do, could affect the confidence in communication skills accordingly. As the confrontation with negative stereotypes can increase anxiety and therefore have an impact on mood, such negative changes in mood can in turn have a negative impact on the recollection of past events (Bower, 1981).

As the content of the stereotype threat material primarily focused on declining health and competency, and previous research has demonstrated the effect these stereotypes can have on self-assessments, it was expected that the self-assessments used in this research would be affected as well. As all seven outcomes mentioned above share the attribute of being pure self-judgements without the social connotations of outcomes in the second category, they can all be expected to be affected by the manipulation. For the purpose of this study, all outcomes were assumed to belong to the same outcome-domain and assumed to be similarly affected.

Therefore, they have been clustered together into a composite variable called *self-assessment*. This was done to simplify the analysis and in the hope of increasing statistical power, leading to the following hypothesis:

H1: the self-assessment cluster will show significant differences in scores for participants confronted with negative old age stereotypes, compared to the control group.

The second category of outcomes centers around the social experience of participants. These are sociability, social-self worth, social anxiety, sense of belonging and social approach or avoidance motivation. The literature relating stereotype threat to the social experience of people affected by it is considerably scarcer, but examples do exist. For instance, Thoman et al. (2013) showed that stereotype threat negatively impacts the sense of belonging of minority students. It is also possible that the effect on such outcomes is mediated by the effect stereotype threat can have on self-esteem, considering that Leary et al. (1995) showed that people's self-esteem is strongly connected to the sense of social acceptance and sociability. With regards to old age stereotypes, Cheng (2020) demonstrated that after priming older adults with negative old age stereotypes, not only did they show worse self-perception and higher health anxiety, but they were significantly less satisfied with the social support from family members. Cheng speculated that this could be a direct effect of the stereotype priming, arguing that "both self-stereotypes and beliefs about family support are activated directly by the priming, and a mediating mechanism via health anxiety may not be necessary" (p.987).

Taken together, this evidence shows the potential of stereotype threat to impact people's social experience, be it directly or mediated through other effects. It was therefore assumed that the confrontation with old age stereotypes would impact the social experience of participants in this study. The five questionnaire outcomes relating to social experience were also clustered together into a second composite variable called *social experience*, for the reasons stated above, leading to the second hypothesis:

H2: the social experience cluster will show significant differences in scores for participants confronted with negative old age stereotypes, compared to the control group.

While an effect on all the questionnaire outcomes can be expected, the effect will likely differ in size. As pointed out above, the impact on the self-assessment outcomes should be more direct, while some of the social-experience outcomes might be affected through mediators. Additionally, the content of the stereotype threat manipulations used in this research primarily centered around decline in health and function, with some self-assessment questionnaire also focusing on health and function or ability. According to the *stereotype matching effect* (Levy & Leifheit-Limson, 2009), the effect of stereotypes is greater when the

specific stereotype content corresponds to the outcome domain. Following this research, the current study assumes that:

H3: stereotype threat will show greater effects on the self-assessment cluster than on the social experience cluster.

The different outcomes can not only be expected to be affected differently in degree, but also in direction. As it has been argued in detail above, the level of awareness of the stereotype should play the crucial role in determining the direction of the effect. While the implicit manipulation should have presented the stereotype in a way that leads to subconscious processing, both the explicit (or information) and the semi-explicit (or instruction) conditions should have forced a conscious engagement with the stereotype. This study therefore suggests that:

H4: participants in the implicit condition will show stereotype assimilation effects, whereas participants in the explicit and semi-explicit condition will show contrast effects in the questionnaire based composite outcomes.

The third category of outcomes comes from the transcripts of participants relating a story about a social interaction with a younger person. These outcomes were calculated using the Linguistic Inquiry and Word Count (LIWC) program to analyze transcripts. LIWC analysis can be used to gain insights into a “wide variety of experimental settings, including to show attentional focus, emotionality, social relationships, thinking styles, and individual differences” (Tausczik & Pennebaker, 2010, p.24). Specifically, these outcomes are word count, tone, MATTR (moving average type token ratio) and health. Word count is simply the number of words people speak, after being asked to relate a story about an interaction with a younger individual. For the purpose of this study, word count can be understood as a kind of *applied sociability*. It does seem plausible, that people who feel more sociable, would talk more openly, freely and for longer duration, because sociability is in essence the tendency to affiliate with others (Cheek & Buss, 1981). In addition, sociability correlates with self-esteem (Cheek & Buss, 1981). It can therefore be hypothesized that:

H5: word count will be higher in the implicit condition and lower in the explicit and semi-explicit condition, compared to the control group.

Moving average type token ratio (MATTR) is basically a measure of lexical diversity. It was one of the variables used by Gordon et al. (2019) to construct measures of observed communication competency. MATTR can be understood as a speech performance outcome. As part of H4 it is expected that self-assessed communication competency (as part of the self-assessment composite) will be lower in the implicit condition and higher in the explicit and

semi-explicit condition, which begs the question, whether speech performance would follow the self-assessment. As elaborated upon above, stereotype threat has been hypothesized to come about through different pathways, either as a stress response or through changes in self-image. The predicted worsening of self-image in the implicit condition suggests a worsening in performance. Although this study predicts that the changes in self-image will go in different directions depending on the experimental condition, it is further expected that the performance will worsen in all conditions. This is based on the idea that the very creation of contrast effects can be understood as part of a stress response. While this stress response might be able to protect the self-image from harm, the stress it responds to will still take cognitive resources away from task performance. It is therefore hypothesized that:

H6: MATTR-scores will be lower in all experimental conditions compared to the control group.

The third outcome based on the story transcripts is Tone. According to Tausczik and Pennebaker (2010) it is essentially the emotional charge of a given text, with a higher number indicating a positive and lower number a more negative state. Given that participants in the implicit condition are expected to experience a worsening of their self-image, and the participants in the explicit and semi-explicit condition are expected to demonstrate a stress response, participants in all experimental conditions are expected to show a more negatively charged emotional state than in the control group. This leads to the following hypothesis:

H7: all experimental groups will have lower tone scores than the control group.

The final variable is health. Health basically sums up health-related vocabulary, therefore showing that health is “on the mind” of the person speaking. Given that it is expected that explicit and therefore conscious confrontation with stereotypes produces contrast effects, including in the health self-assessment outcomes, the topic of health should therefore be “on the mind” of the participants in the explicit and the semi-explicit condition. Conversely there is no reason to expect more health-related vocabulary in the implicit condition, leading to the following hypothesis:

H8: participants in the explicit and semi-explicit condition will have higher health scores than those in the implicit condition or control group.

The Role of Age and Education

Several factors can have a moderating impact on the effects of stereotype threat. Of particular interest for this research was the role of education and age of the people experiencing the threat. With regards to the influence of education, several studies have already investigated it, interestingly with opposing results. For example, a study by

Andreoletti and Lachman (2004), that tested people's memory performance after exposing them to stereotype or counterstereotype information, found people with higher level of education to be more resilient in the threat condition. In contrast stands a study by Hess, Hinson and Hodges (2009), which demonstrated that older adults with higher degrees of education were more vulnerable to the threat. The method of manipulation used by Hess, Hinson and Hodges was considerably more subtle than the one used by Andreoletti and Lachman, which may have played a role in the difference of effect direction.

It seems obvious that age should be a relevant factor in the vulnerability towards old age stereotype. However, the influence is also considerably more nuanced than one might expect. Hess, Hinson and Hodges (2009), for instance, found "young old" people to be more vulnerable than "old old" people, arguing that "stronger impact of threat in the 60s could reflect the salience of membership in the stereotyped group of "older adult," which may be particularly high as individuals enter this group" (p.171). Hess and Hinson (2006) similarly showed the oldest participants in their study to be less affected by stereotype threat. It is noteworthy that both of these studies used relatively explicit ways to induce the stereotype threat. However, a meta-analysis by Lamont et al. (2015) found no significant effect for age, although they were careful to point out that "these "null" findings do not rule out the possibility that age and gender moderate ABST (age-based stereotype threat)" (p.189). To perform such moderator analyses would overwhelm the scope of this research. However, given the potentially confounding role of age and education, this research included them as covariates. This was done in the hope of increasing statistical power and showing the influence of the manipulation conditions more clearly.

The Role of Attitudes Regarding Old Age

Another possible factor in the susceptibility to old age stereotypes are the attitudes towards old age, which the participants bring with them. As has already been mentioned above, regarding stereotype embodiment people can internalize various negative stereotypes over the course of their lives (Levy, 2009). It may be that people who have internalized more negative stereotypes and therefore have a more negative view of old age are more vulnerable towards stereotype threat, because internalized stereotypes can be activated, when those stereotypes are made salient (Levy, 2009). This research aimed at testing this assumption by making use of the identification task in the experimental conditions at the beginning of the study. Participants were asked to write down three things they have in common with other older adults. The answers were evaluated for their emotional valence. People with a low valence were assumed to have internalized a relatively negative view of old age and vice

versa. While the effect of the manipulation condition was expected to mostly differ in effect direction, the effect of internalized old age stereotypes should be unidirectional, meaning a high level of negative internalized old age stereotypes should enhance the effect of assimilation in the implicit condition and dampen contrast effects in the explicit and semi-explicit condition. This could be because stereotypes are more easily activated when the manipulation is implicit (Bargh et al., 1996) and the stereotype matching effect predicts that people with a negative view of old age are more vulnerable towards stereotypes. In the explicit and semi-explicit condition distancing oneself could be harder and therefore the contrast effects might not be as pronounced. Bless and Burger (2016) point out that “when individuals consider accessible information as irrelevant, they can exclude this information from their representation of the judgmental target, which, in turn, will elicit contrast effects” (p.27). If participants already have a negative view of old age, and already believe they share some negative traits with their age cohort, they might view negative information as more relevant to them and the possibility of contrast effects decreases. Conversely it could be expected that a relatively positive view of old age would dampen the assimilation and enhance the contrast effects, as people with such views are less vulnerable to stereotypes and would find stereotype laden information to be less relevant to them and therefore easier to distance from. The final hypothesis is therefore:

H9: the valence of the identification task will moderate the effects of the manipulation conditions.

Method

Overview

This analysis used experimental data collected as part of the TEWA seminar within the master program in psychology of the university of Vienna over the course of the summer semester 2022 under the guidance of Professor Doctor Jana Nikitin. The data was also used for master theses by Nitzschke (2023) and Kopf (2024). The study was conducted as an experiment with a between-subjects design with subjects divided into one of three different experimental groups or one control group. The experimental groups differed in their method of manipulation, with one using the explicit, the second the semi-explicit and the third an implicit form of manipulation. The independent variable was the manipulation methods designed to induce stereotype threat with regards to old age stereotypes, whereas the dependent variables were two composite variables based on a variety of questionnaires and four interview-based outcomes. The questionnaire outcomes, on which the composites are based, are listed below, as are the individual interview-based outcomes. The composites were

calculated as the mean of the questionnaires they were based on. A replication of the study was expected to be completed in the middle of 2023.

Sample

In total $N = 128$ people participated in this study, consisting of 77 women and 51 men, with no participants identifying as other. Sampling was randomized. The participants were between 59 and 94 years of age, with an average age of 70.35 and a standard deviation of $SD = 8.22$. The highest educational achievement was rated on a scale of 1 (*not finished school*) to 5 (*university degree*). 7 % percent of participants did not finish school, 7.1% had basic school education (Pflichtschule), 20.7% learned a trade (Lehre), 22.1% had an advanced school education (Matura/Fachhochschule) and 40.0% had a university degree. No participant had to be excluded due to missing values, there were however three missing interviews.

Manipulation Tasks

The first experimental condition was the information condition. It is also referred to as the *explicit condition* because it forced participants to engage directly and consciously with potentially stereotype activating information. This condition was developed based on previous research by Weiss and Lang (2012). The information used by Weiss and Lang was adapted for the Austrian context and turned into a podcast (see Appendix A), recorded by the students. The podcast contained various examples of factually accurate information with negative connotations about older adults. An example would be that the risk of developing dementia increases sharply after the age of sixty.

The second experimental condition was the instruction condition. It used a quiz, designed by the students (see Appendix B). It consisted of seven questions about factually accurate information regarding old age with three options for answering. An example would be asking what percentage of adults above the age of ninety get diagnosed with dementia. This condition will in the following also be referred to as the *semi-explicit condition*, because it also forces conscious engagement with potentially stereotype threat inducing information. Unlike the explicit condition, there was a level of ambiguity about the precise content of the information due to the quiz format.

The *implicit condition* was presented to the participants with a scrambled sentence task (see Appendix C), based on Bargh et. al (1996), consisting of 14 items. Each item consisted of five words, of which only four could be arranged into a grammatically correct sentence, all containing one word connected to an old age stereotype, for example “forgetful”. The other four “neutral” words were taken from previous research by Walther et al. (2001) to ensure they were of low or no valence.

In the *control condition* the subjects also had to answer a quiz (see Appendix D), consisting of six questions with three answer options each. The information presented in this condition was not about old age, but about facts surrounding the topic of climate change. The material which was used here was based on previous research by Weiss and Lang (2012).

Those participants assigned to one of the experimental conditions were presented with an additional identification task (see Appendix E) prior to the manipulation to ensure the subjects identified themselves with the group of older adults. This identification task consisted of writing three short sentences in which the subjects should explain what they had in common with older people and was based on previous research by Weiss et al. (2013).

Statistical Power

Based on the effect sizes of comparable methods used in previous research ($d \approx .60$; Weiss & Freund, 2012; Weiss & Lang, 2012) the sample size was estimated at $N = 128$ with an alpha error probability of .05 and a beta error probability of .80. Given that previous analyses conducted as part of the TEWA-seminar using this dataset, only small effect sizes ($d = .10 / .20$) should be expected. Based on an effect size of $\eta^2 = 0.10$, an alpha error probability of .05 and a beta error probability of .80 an ideal sample size was estimated at $N = 1084$ (Hemmerich, 2018).

Procedure

The participants were recruited by the students carrying out the study through their social networks and through organizations like counseling centers, which cater to older adults. The study was advertised as focusing on intergenerational contact. The participants were tested individually in the laboratory of the psychology department of the university of Vienna or in comparable adequate locations. Testing was conducted by the students attending the TEWA-seminar. The testing took about 50 minutes of time and consisted of the following steps: participants were greeted, given the instruction, as well as a consent form. They were then randomly assigned to one of the three experimental conditions, or the control group, and the respective manipulation method was presented. Next, the participants were given questionnaires regarding self-evaluations or their social behavior and experience. After the questionnaires were completed, they were asked to recount a recent interaction they had with a younger person, which should last around two minutes and was recorded on a smartphone. The students conducting the study were instructed to either advise finishing the story around the two-minute mark or to ask additional questions, if the story fell too short of the two-minute mark. The recording was later transcribed and analyzed using the LIWC program

(Wolf et al., 2008). Finally, the participants were thanked, debriefed, and compensated for their time with the amount of ten euros.

Dependent Measures

Identification Task

The identification task was only presented to the participants in the three experimental conditions. The task consisted of the request “please explain in three short sentences what similarities you have with old people” and three numbered blank lines to write down the answers (see Appendix E). The task was based on a similar approach used in a study by Weiss et al (2013). The valence of the answers was judged by two raters to be either negative (-1), neutral (0) or positive (1). The interrater reliability was significant with a $p < .001$ and a Cohens Kappa of .696. The mean of the three answers was calculated and defined as the variable *valence* on a bipolar continuous scale, with $M = -.21$ and $SD = 0.62$.

Manipulation Check

Based on Rahn et al. (2021), a three-item scale (see Appendix F) to assess the internalization of negative age stereotypes was used. The three questions focused on the participant`s believe that decline in old age was inevitable, that such decline was noticed by them, and that decline was noticed by others in them. Agreement was rated on a 7-point Likert-type scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*).

Self-Assessment Composite

The self-assessment composite was constructed by calculating the mean of several questionnaires focused on self-evaluations. To ensure coherence all questionnaires were coded, so that a higher score indicated a higher or more positive self-assessment. The questionnaires included, were the following:

Satisfaction of Basic Psychological Needs. Based on research by Ryan and Deci (2000), this questionnaire (see Appendix G) aimed at measuring the satisfaction of the basic psychological needs postulated by *self-determination theory*, namely competency, autonomy, and relatedness. An example would be “I feel competent in what I do”. In total the scale consisted of 7 questions with participants rating their agreement on a 7-point Likert-type scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*).

Self-Esteem. The scale for self-esteem (see Appendix H) was taken from a paper by von Collani and Herzberg (2003), which revised the German translation of the Rosenberg-scale. The Rosenberg self-esteem scale is considered a reliable and valid quantitative tool for self-esteem assessment and is widely used in research. Self-esteem, as measured by this scale, is arguably a global, affect-laden self-assessment. An example item would be “all in all I am

happy with myself”. Von Collani and Herzberg reported a Cronbachs alpha of $\alpha = .84$ for their revised German language version. The scale consisted of 10 questions, but unlike the original 4-point Likert-type scale, a 7-point Likert-type scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*) was used to be in line with the other questionnaires.

Communicative Competence. The subject’s self-assessment of communicative competence (see Appendix I) was based upon the language in adulthood questionnaire, developed by Ryan et al. (1992). While the original version used 20 items across three domains, only eight questions from the subscale expressive communicative competence were used in this research. An example item would be “I have difficulty remembering facts, when telling a story”. This particular subscale had an internal consistency (Cronbach’s alpha) of $\alpha = .50$. For each item, participants rated their agreement on a 7-point Likert-type scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*).

Attitude Towards Aging. Attitude towards aging (see Appendix J) was measured with the subscale of the same name from Philadelphia Geriatric Center morale scale by Liang and Bollen (1983). It asks participants how they perceive changes in their life related to their age. An example item would be “With increasing age, my life is better, than I anticipated”. The scale consisted of five question items and agreement was rated on a 7-point Likert-type scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*).

Mental Health. Mental health (see Appendix K) was assessed with a single question, asking participants to self-asses their mental health on a 7-point Likert-type scale ranging from 0 (*very bad*) to 6 (*excellent*).

Physical Health. Physical health (see Appendix L) was assessed with a single question, asking participants to self-assess their physical health on a 7-point Likert-type scale ranging from 0 (*very bad*) to 6 (*excellent*).

Feeling Last Three Months. This questionnaire (see Appendix M) was based on a subscale of the German language Mehrdimensionaler Befindlichkeitsfragebogen by Steyer et al. (1997). It tried to assess the emotional state in the previous three to four months by referring to 12 different emotion-based adjectives (i.e. satisfied or restless). Agreement was rated on a 7-point Likert-type scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*).

Social-Experience Composite

The social-experience composite was constructed by calculating the mean of five questionnaires focused on social experiences. To ensure coherence all questionnaires were coded, so that a higher score indicated a higher or more positive sense of social experience.

For instance, a high level of social anxiety would lead to a lower social-experience composite score. The questionnaires included, were the following:

Sense of Belonging. To assess the participant's sense of social belonging, a questionnaire (see Appendix N) based on a previous study by Good et al. (2012) was created. Because the original questionnaire was created to assess women's sense of belonging to the math community, some questions had to be reformulated to apply to the wider society and only 22 out of the original 30 questions were used. An example would be "If I think of my position in society, I feel like I fit in". For each item, participants rated their agreement on a 7-point Likert-type scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*). The study by Good et al. reported a Cronbach's alpha of $\alpha = .78$ for the original scale.

Social Approach and Avoidance Motivation. Based on a study by Nikitin and Freund (2019), as well as Lavigne et al. (2011), this six-question questionnaire (see Appendix O) seeks to measure people's inclination to either seek out positive or avoid negative social experiences. An example question on seeking out positive experience would be "I want to spend a great time with others" whereas "I don't want to be hurt by other people" would be an example of avoiding a negative experience. Agreement was rated on a 7-point Likert-type scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*).

Social Self-Esteem. To assess the participant's sense of social self-esteem, the scale used by Bacq and Alt (2018) was based on Grant and Gino (2010) and adapted for the current research (see Appendix P). The Social self-esteem scale aims to gauge the participant's sense of social worth. An example item would be "I felt that I made a positive difference in the lives of the people that I helped". In total, the scale had six question items. Agreement was rated on a 7-point Likert-type scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*). Grant and Gino reported a Cronbach's alpha of $\alpha = .84$ for the scale in their original research.

Social Anxiety. Social anxiety was assessed with a five-item scale (see Appendix Q), based upon the personal report of communication apprehension questionnaire used by Manning and Ray (1993). It aims at measuring people's level of anxiety within social interactions. An example item would be "When I speak to someone, I worry what the other person may think of me". Agreement with questions concerning the participant's sense of anxiety when interacting with others was rated on a 7-point Likert-type scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*).

Sociability. Sociability was measured using the sociability-subscale (see Appendix R) from the extraversion dimension from the Big-Five personality test. Sociability is regarded as an individual's tendency to seek out and enjoy social interactions. An example would be "I am

enthusiastic and easily get others carried away”. The scale was translated into German by Danner et al. (2012) and was reported to have a Cronbach’s alpha of $\alpha = .76$. It consisted of twelve question items and agreement was rated on a 7-point Likert-type scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*).

Outcomes Based on the Story Transcription

Wordcount. The total number of words used by study participants and their retelling of an interaction with a younger individual.

Tone. This outcome was calculated using the LIWC program by Wolf et al. (2008). It was a summary variable for the categories positive and negative emotion and basically counts emotionally positively and negatively charged words and puts their number in the context of the overall text length. Tone was measured on an interval scale ranging from 0 to 100, where values above 50 were interpreted as more positively and values below 50 as more negatively charged.

Health. This outcome was calculated using the LIWC program by Wolf et al. (2008). It counted the number of health-related words used in the text. LIWC includes predefined dictionaries with words associated with health and wellness topics (e.g., "doctor," "illness," "pain," "diet"). These words were curated by experts based on their relevance to health and health-related discourse. When analyzing a text, LIWC scans for matches to the words in the health dictionary. Each instance of a health-related word adds to the overall health score. The score is expressed as a percentage of the total word count in the text. For example, if 3% of the words in a text match health-related terms, the "health" score for that text would be 3.

Moving Average Type Token Ratio (MATTR). MATTR was based upon an algorithm developed by Covington and McFall (2010). Like the more well-known type-token-ratio it is considered to be a measure of lexical diversity but has the added advantage of being able to adjust to the length of text. Given that differences in text length were to be expected in this research, it was chosen as a superior alternative to the regular type-token ratio. The MATTR scores were calculated using the online tool *Ratte* by Wild and Pissarek (n.d.).

Covariates

Age was self-reported by the participants. Education was measured by checking one of six boxes for the highest level of education which had been attained. The categories referred to: 1 = no school degree, 2 = mandatory school degree, 3 = vocational training, 4 = advanced school degree (Abitur/Matura) or applied university (Fachhochschule), 5 = university degree, 6 = other (blank space to fill in the degree). People who filled in the “other” category either

had their degree matched to the corresponding category or, where this was not possible, were attributed the mean education score of all participants.

Results

Data analyses were performed using SPSS 24 (IBM Corp, 2016) and the criterion for statistical significance was $p < .05$. In the first round of analysis a one-way analysis of variance (ANOVA) was performed, followed by post hoc tests using the Least Significant Difference (LSD) test. This was followed by an analysis of covariance (ANCOVA). In case of a significant covariate an additional regression analysis was performed. Finally, moderation analyses were conducted using Hayes's PROCESS macro for SPSS (Hayes, 2013).

Descriptive Analysis

The participants in the implicit condition were slightly older ($M = 72.69$, $SD = 8.66$) than those in the explicit ($M = 68.59$, $SD = 6.31$) and semi-explicit ($M = 69.48$, $SD = 7.72$) condition, as well as those in the control group ($M = 70.60$, $SD = 9.63$). The difference was however not significant ($p = .22$). With regards to education, 7 % percent of participants did not finish school, 7.1% had basic school education (Pflichtschule), 20,7% learned a trade (Lehre), 22.1% had an advanced school education (Matura/Fachhochschule) and 40.0% had a university degree. The participants in the implicit condition had the highest ($M = 4.25$, $SD = 0.92$) level of education, compared to those in the explicit ($M = 3.97$, $SD = 1.00$) and semi-explicit ($M = 3.91$, $SD = 0.94$) condition, as well as those in the control group ($M = 4.00$, $SD = 1.24$). The difference was also not significant ($p = .57$).

Preliminary Analysis - Manipulation Check

The test of reliability showed a Cronbach's alpha of $\alpha = .66$. The requirements for an ANOVA were met, but the results were not significant ($p = .44$, $F = 0.91$, $\eta^2 = .02$). Participants in the explicit ($M = 1.42$, $SD = 1.34$), semi-explicit ($M = 1.69$, $SD = 1.29$) and in the implicit ($M = 1.82$, $SD = 1.34$) scored higher than those in the control group ($M = 1.29$, $SD = 1.34$). Post-hoc comparisons using the LSD test showed no significant difference between any of the groups.

Dependent Measures

Composite Outcomes

Self-Assessment. The self-assessment composite showed a Cronbachs alpha of $\alpha = .85$. The criteria for ANOVA were met and the results were significant. The requirements for ANOVA were met and a one-way ANOVA revealed a significant main effect of the manipulation condition on self-assessment, $F(3,121) = 3.59$, $p = .016$, $\eta^2 = .08$. Participants in the implicit condition ($M = 4.09$, $SD = 0.81$) scored significantly lower than those in the

explicit ($M = 4.59$, $SD = 0.66$) and semi-explicit ($M = 4.62$, $SD = 0.62$) condition, as well as those in the control group ($M = 4.47$, $SD = 0.80$). Post-hoc comparisons using the LSD test indicated that the implicit condition differed significantly from the explicit ($p = .01$) and semi-explicit condition ($p = .004$), as well as from the control group ($p = .04$).

Because age and education were expected to influence self-assessment, an ANCOVA was conducted to control for these covariates. Assumptions of linearity, normality, and homogeneity of regression slopes were checked and met. After controlling for age and education, there was still a significant effect of the manipulation condition on self-assessment $F(3,121) = 3.50$, $p = .018$, $\eta^2 = .08$. Both age $F(1,123) = 5.94$, $p = .016$, $\eta^2 = .05$ and education $F(1,123) = 7.21$, $p = .01$, $\eta^2 = .06$ were significantly related to self-assessment. Age was negatively associated with self-assessment, $B = -0.03$, $SE = 0.01$, $\beta = -.27$, $p = .001$, while education was positively associated, $B = 0.13$, $SE = 0.07$, $\beta = .18$, $p = .04$.

Social Experience. The social-experience composite showed a Cronbach's alpha of $\alpha = .74$. The requirements for ANOVA were met and a one-way ANOVA revealed no significant main effect of the manipulation condition on social experience, $F(3,121) = 0.68$, $p = .56$, $\eta^2 = .02$. Participants in the implicit condition ($M = 4.02$, $SD = 0.54$) scored lower than those in the explicit ($M = 4.21$, $SD = 0.67$) and semi-explicit ($M = 4.23$, $SD = 0.77$) condition, as well as those in the control group ($M = 4.07$, $SD = 0.82$). Post-hoc comparisons using the LSD test indicated that the implicit condition did not differ significantly from the explicit condition ($p = .28$), the semi-explicit condition ($p = .23$) or from the control group ($p = .75$).

To adjust for the potential influence of age and education, an ANCOVA was conducted to control for these covariates. Assumptions of linearity, normality, and homogeneity of regression slopes were checked and met. After controlling for age and education, the effect of the manipulation condition on social experience decreased $F(3,121) = 0.53$, $p = .67$, $\eta^2 = .01$. Neither age $F(1,123) = 0.18$, $p = .71$, $\eta^2 = .00$ nor education $F(1,123) = 0.16$, $p = .49$, $\eta^2 = .00$ were significantly related to self-assessment.

Outcomes Based on the Story Transcription

Wordcount. The requirements for ANOVA were met and a one-way ANOVA revealed no significant main effect of the manipulation condition on social experience, $F(3,119) = 1.97$, $p = .12$, $\eta^2 = .05$. Participants in the implicit condition ($M = 181.94$, $SD = 83.76$) used fewer words than those in the explicit ($M = 256.72$, $SD = 172.19$) and semi-explicit ($M = 253.55$, $SD = 144.57$) condition, as well as those in the control group ($M = 224.13$, $SD = 128.80$). Post-hoc comparisons using the LSD test indicated that the implicit

condition did differ significantly from the explicit ($p = .03$) and semi-explicit condition ($p = .04$), but not from the control group ($p = .23$).

To adjust for the potential influence of age and education, an ANCOVA was conducted to control for these covariates. Assumptions of linearity, normality, and homogeneity of regression slopes were checked and met. After controlling for age and education, there was a significant effect of the manipulation condition on wordcount $F(3,119) = 3.25, p = .024, \eta^2 = .08$. Education $F(1,121) = 12.95, p < .001, \eta^2 = .10$ was significantly related to tone, while age $F(1,121) = 0.20, p = .66, \eta^2 < .00$ was not. Education, $B = 36.08, SE = 11.61, \beta = .27, p = .002$ was positively associated with wordcount.

Moving Average Type Token Ratio (MATTR). The requirements for ANOVA were met and a one-way ANOVA revealed no significant main effect of the manipulation condition on social experience, $F(3,121) = 1.61, p = .19, \eta^2 = .04$. Participants in the implicit condition ($M = .78, SD = .05$) scored similar to those in the explicit ($M = .78, SD = .04$) and higher than those in the semi-explicit ($M = .07, SD = .07$) condition, as well as those in the control group ($M = .77, SD = .04$). Post-hoc comparisons using the LSD test indicated that the implicit condition did not differ significantly from the explicit ($p = .94$) and semi-explicit condition ($p = .06$), nor from the control group ($p = .33$).

To adjust for the potential influence of age and education, an ANCOVA was conducted to control for these covariates. Assumptions of linearity, normality, and homogeneity of regression slopes were checked and met. After controlling for age and education, there was still no significant effect of the manipulation condition on MATTR $F(3,119) = 1.20, p = .31, \eta^2 = .03$. Neither age $F(1,121) = 1.32, p = .25, \eta^2 = .01$ nor education $F(1,121) = 1.90, p = .171, \eta^2 = .02$ were significantly related to MATTR.

Tone. The requirements for ANOVA were met and a one-way ANOVA revealed no significant main effect of the manipulation condition on social experience, $F(3,119) = 1.00, p = .39, \eta^2 = .02$. While not significant, the predicted pattern was observed, as participants in the implicit ($M = 74.21, SD = 27.98$), explicit ($M = 78.55, SD = 24.05$) and semi-explicit ($M = 73.66, SD = 30.57$) condition, scored lower than those in the control group ($M = 83.87, SD = 22.97$). Post-hoc comparisons using the LSD test indicated that the neither the implicit ($p = .15$) nor the explicit ($p = .42$) nor the semi-explicit ($p = .13$) condition did significantly differ from the control group.

To adjust for the potential influence of age and education, an ANCOVA was conducted to control for these covariates. Assumptions of linearity, normality, and homogeneity of regression slopes were checked and met. After controlling for age and

education, there was still no significant effect of the manipulation condition on tone $F(3,119) = 1.30, p = .28, \eta^2 = .03$. Both age $F(1,121) = 7.89, p = .008, \eta^2 = .06$ and education $F(1,121) = 10.90, p = .001, \eta^2 = .09$ were significantly related to tone. Both Age $B = -0.74, SE = 0.29, \beta = -.23, p = .011$, and education, $B = -7.28, SE = 2.29, \beta = -.28, p = .002$ were negatively associated with tone.

Health. The requirements for ANOVA were met and a one-way ANOVA narrowly failed to show a significant main effect of the manipulation condition on social experience, $F(3,121) = 2.57, p = .06, \eta^2 = .06$. Participants in the explicit ($M = 0.84, SD = 0.98$) and semi-explicit ($M = 0.95, SD = 0.91$) condition scored higher than in the implicit ($M = 0.51, SD = 0.64$), as well as those in the control group ($M = 0.47, SD = 0.67$). Post-hoc comparisons using the LSD test showed a significant difference between the semi-explicit and the implicit condition ($p = .04$) and between the semi-explicit condition and the control group ($p = .03$), but not between the explicit condition and implicit condition ($p = .12$) or control group ($p = .09$).

To adjust for the potential influence of age and education, an ANCOVA was conducted to control for these covariates. Assumptions of linearity, normality, and homogeneity of regression slopes were checked and met. After controlling for age and education, the effect of the manipulation condition on health increased to be narrowly significant $F(3,121) = 2.49, p = .49, \eta^2 = .07$. Neither age $F(1,123) = 0.02, p = .90, \eta^2 = .00$ nor education $F(1,123) = 0.16, p = .69, \eta^2 = .00$ were significantly related to health.

Moderator Analysis Using the Valence of the Identification Task

A moderator analysis for each outcome was performed. As Table 1 shows, none of the interaction terms was statistically significant ($p > .05$), indicating that valence of the identification task did not significantly influence the relationship between the manipulation condition and the listed outcomes.

Table1

Interaction Terms Across Outcomes

Outcome	<i>p</i>	<i>b</i>	<i>SE</i>
Self-assessment	.17	0.22	0.15
Social experience	.95	0.00	0.15
Word count	.55	18.59	30.95
Tone	.84	1.24	6.02
MATTR	.86	0.00	0.01
Health	.38	-0.17	0.19

Note. This table shows p-values, unstandardized coefficients (b) and standard errors (SE) for moderation analyses across the six outcome variables.

Summary of the Results

The self-assessment composite showed significant results and H1 can therefore be accepted. The social experience composite did not show significant results, neither directly nor in any post hoc test and H2 is therefore rejected. Given that the effect on self-assessment was greater, than the effect on social-experience, H3 can also be accepted.

The primary question of this research was whether conscious awareness of the stereotype can produce outcomes, which are not only different in degree but in direction, compared to unconscious confrontation with stereotypes. The results of this study seem to confirm this hypothesis at least partially. The self-assessment outcome showed not only a significant overall result, but the implicit condition scored significantly below both the control group and the explicit and semi-explicit condition. While the social experience outcome did not produce any significant results, it also showed a pattern of higher scores in the explicit and semi-explicit condition and lower scores in the implicit condition compared to the control group, indicating contrast versus assimilation effects. Therefore, H4 is also accepted.

The outcomes based on the story transcripts showed complex and nuanced results. Wordcount did not show significant results and H5 is therefore rejected. However, it did show the predicted pattern of higher scores in the explicit and semi-explicit condition and lower scores in the implicit condition compared to the control group and produced one significant post-hoc test. Implications of this finding will be discussed in the next section.

Moving-average type-token ratio did not produce any significant results and failed to show the predicted pattern as well. H6 is therefore rejected.

Tone did neither show a significant main effect nor significant post-hoc tests and H7 therefore has to be rejected. It did however show the predicted pattern and implications of this finding will be discussed in the next section.

Health narrowly failed to show a significant main effect but did show the predicted pattern of higher scores in the explicit and semi-explicit condition. In addition, there were two significant post-hoc test for the semi-explicit condition. Implications of this finding will be discussed below.

Given the predicted pattern was shown and results were very close to significant overall and partially significant in the relevant post-hoc test, H8 is accepted. The moderator analysis showed no significant results in any outcome. H9 is therefore rejected.

Discussion

Taken together, the results of the various outcomes in this study form a complex and nuanced picture. A problem for the interpretation was that the endorsement of negative stereotypes, used as a manipulation check, failed to reach significance. However, all three experimental conditions saw higher levels of stereotype endorsement than the control group. Why this is noteworthy will be shown in the next section.

The Influence of the Manipulation Task and Self-Assessment

While it is a problem that the manipulation check used in research failed to reach significance, the fact that all three experimental conditions showed higher levels of stereotype endorsement can still be interpreted as demonstrating the manipulation effects, given that it was predicted and partially confirmed that two conditions produced contrast effects. The manipulation check followed the pattern seen in the outcomes, with the implicit condition showing the highest endorsement and also the strongest effects. Examining the self-assessment composite outcome in particular, reveals stronger evidence of stereotype threat (resulting in assimilation) in the implicit condition than in the other two conditions, as it was the only condition to produce a significant post-hoc effect compared to the control group.

Meanwhile the explicit and semi-explicit condition showed weaker, non-significant, contrast effects, corresponding to the weaker levels of stereotype endorsement. Because people produce these contrast effects to protect themselves from the impact of stereotypes, it does seem plausible the same people would also endorse stereotypes less, explaining the lack of significance in the manipulation check. Interestingly the instruction (or semi-explicit) condition showed slightly more evidence for contrast effects, although these differences were small and not significant. Group differences are unlikely to have caused this, considering the people in the instruction condition were slightly older and slightly less educated than the people in the information condition, with age having a negative and education having a positive influence on the outcome.

While both, the information and the instruction condition, used information about declining health and subsequent dependency to induce the stereotype threat, they did not present it in the same way. The instruction condition presented the information in the form of a quiz, which introduces an element of ambiguity about just “how bad” the health decline and therefore the threat is. It also forces a more active engagement with the information presented, which, in connection with the ambiguity about the precise content of the information, might lead to a greater degree of anxiety and therefore more stereotype threat. Some support for this

conjecture comes from the outcome “tone”, which showed the participants in the instruction condition to have the most negative mood, when telling their story.

The lack of significant contrast effects compared to Pinquart (2002) may again be explained by the way the stereotype was presented. In Pinquart’s study, the confrontation with the stereotype was done in a conscious way, but the material used was quite different from this study. Whereas this research presented participants with potentially threatening but accurate information about declining health and associated increased risk in old age, Pinquart’s study confronted participants with actual stereotypes in the form of negative or even hostile attitudes, supposedly uttered by adolescents. An example would be “often the old bastards are a real nuisance. They say stupid things. Most old people live in the past and don’t understand what is going on” (Pinquart, p.335). If we look at this through the lens of the multi-threat framework by Shapiro and Neuberg (2007), Pinquart’s framing may be more accurately characterized as a group-concept threat by an outgroup. The group of adolescents was presented as having very negative and stereotypical attitudes towards the group of older adults. A possible defense mechanism against such a threat, proposed by the multi-threat framework, would be to disengage as representative of the group. In Pinquart’s study this was expressed through worsening peer perception, which can be read as an internalization of the stereotype, while simultaneously disengaging from the group through improved self-perception. Older people may be like that, but me, personally, I am different, so to speak. By contrast, the information presented in the explicit and semi-explicit condition of this study may be more accurately characterized as primarily a self-concept threat. It may be that a group-concept threat by an outgroup elicits a stronger response than a self-concept threat.

An alternative explanation could be the specific framing of the threat as hostile attitudes. This interpretation is supported by literature, as stereotype-based manipulations were shown to be generally more effective than fact-based manipulations (Lamont et al., 2015). It does seem plausible that a contrast effect should be in proportion to the threat it responds to. The presentation of factual information about declining health in old age may well make people uncomfortable, but it can be more easily dismissed as irrelevant, if a person feels it does not apply to them. By contrast, hostile and insulting attitudes by an outgroup carry the additional burden of being offensive and not rooted in facts. Given that any older adult can be unfairly targeted and therefore affected by such hostile stereotypes, they may be more difficult to dismiss, causing a stronger emotional response and consequently a stronger contrast effect.

The difference in effect direction can be interpreted to show that implicit and therefore subconscious forms of manipulations can have the ability to bypass the kind of defense mechanisms which would be engaged, if the threat was presented in a more conscious way.

Differences in the framing of the stereotype-threat material can also help to explain why the implicit manipulation produced a stronger effect than the explicit ones. Some literature suggests that implicit manipulations are inherently more effective than explicit ones (Vailati Riboni & Pagnini, 2021), but the evidence for this claim is mixed (Meisner, 2012). While this is a possibility, this interpretation does not seem valid, because the implicit and explicit manipulation differed considerably in content. The stronger effect may also, at least in part, be explained by the rooting of the implicit manipulation in stereotypes and not in facts. The scrambled-sentence task used a wide variety of adjectives that evoke a stereotypical negative image of an older person. This “broad strokes”-approach, coupled with the stereotype-focused content of the implicit manipulation, seems to have produced a considerably stronger effect than the narrow, fact-based, approach of the explicit manipulation.

Taken together, the effect the manipulations had on the self-assessment composite in the present study deliver further evidence for two central results from Levy and Leifheit-Limson (2009) and Pinguart (2002), discussed in the beginning. First, the present results are consistent with findings by Levy and Leifheit-Limson and consequently deliver further evidence for the stereotype matching effect, which postulates that stereotype-based manipulation produces stronger effects than fact-based manipulation. Second, when contrasting the results of this research with those of Pinguart, it appears that stereotype-based group concept threats by an outgroup elicit stronger contrast effects than fact-based self-concept threats.

The Influence of the Manipulation Task and the Social Experience Outcome

The social experience composite did not reach significance, but this does not mean that there was no effect. It is important to emphasize that non-significant results should not be dismissed outright, especially when the pattern of results aligns with theoretical expectations. “Don’t believe that an association or effect is absent just because it was not statistically significant” (Wasserstein et al., 2019, p.1). In this spirit, the present study touches on some of the results that were from a purely statistical analysis standpoint, that is p-values, nonsignificant.

There are two possible general explanations for why the effects remained comparatively small and non-significant. Either the material used to induce the threat was ill-

suited for this kind of outcome or, taking into account the stereotype matching effect (Levy & Leifheit-Limson, 2009), the “social domain” is not as affected by old age stereotypes. Given that the direction of the effects in this study mirrors the trends observed in self-assessment, this could mean that there may be similar mechanisms at play in shaping social experiences. The fact that these effects did not reach significance could simply be due to factors such as sample size limitations or the sensitivity of the measures.

On the other hand, social experiences may be fundamentally more complex compared to self-assessment. Social experiences are inherently relational, involving not only perceptions of social support, relationships and interactions with others, but also the dynamic and bidirectional nature of these relationships. Unlike self-assessment, which primarily involves internal self-perceptions, social experience reflects the broader context of how individuals perceive their place within a social network, how they believe others view them, and how they navigate social roles and expectations. As such, social experience may engage a different set of cognitive and emotional processes, potentially involving elements of social identity and social comparison. The complexity and variability of these processes might explain why the social experience composite did not reach significance in this study, as these factors could dilute the immediate impact of stereotype priming observed in self-assessment.

Interestingly, the evidence for contrast effects in this outcome is greater than the evidence for assimilation effects. The questionnaires summarized in the social experience outcome involve perceptions of social relations, social support, and interactions with others. These aspects are inherently relational and may activate a different set of cognitive and emotional processes compared to self-assessment of personal attributes. This suggests that, in the explicit and semi-explicit condition, participants may have engaged in a form of defensive differentiation - distancing themselves from the negative stereotype by enhancing their perceived social support and interactions within social groups. This could be seen as a protective strategy, where older adults respond to the threat by affirming their value within their social circles, thereby reinforcing positive social identities. We may have observed a defense strategy which the multi-threat framework calls “Self-affirm using another domain” (Shapiro & Neuberg, 2007, p.123). As it has been pointed out before, the primary content of the material used in the explicit condition was information about declining health (and to some extent declining competence) in old age. It was therefore expected that the effect on self-assessment would be stronger. While this turned out to be true, it is surprising that the contrast effects were shown to be stronger than the assimilation effects in the social experience outcome. This may be precisely because the narrow focus on health and

competency allowed the participants to self-affirm using the unaffected domain of social experience.

The lack of assimilation effects is more puzzling and may require a different explanation. Unlike the material in the explicit condition, the trigger words used in the scrambled-sentence task in the implicit condition were not narrowly focused on declining health or competence. The included words like “mürrisch” (cranky), “arm” (poor) or “abhängig” (dependent) could invoke negative stereotypes more pertinent to the social situation of older adults. Yet the effect turned out to be even smaller than the contrast effect in the explicit and semi-explicit condition. One of the few studies that has investigated the impact of old age stereotypes on the social experience from older adults came from Cheng (2020). Cheng’s study is a useful reference point because it also used a scrambled-sentence task and found worsening self-perception. Additionally, the study found decreased satisfaction with family support, although not with non-family support. Cheng theorized there could be a cultural component in this result, arguing that “In many Asian cultures, in particular the Chinese culture, it is traditionally the responsibility of the family to cover for the needs of its members, in particular the needs of the older members” (p.987). Stereotypes are always nested in a cultural context, and this should be especially true when it comes to stereotypes that impact one’s sense of relations with other people. It may be that the specific Austrian cultural context, in which this study took place, is not as ripe with the sort of stereotypes that, when activated, would lessen people’s sense of social connection. However, even in Cheng’s study, the negative effect was only observed for family but not for non-family support.

The social experience composite summarized a broader range of questionnaires and did therefore arguably lack the kind of specificity required to observe a clear effect. It is possible that the activation of old age stereotypes can negatively impact the social experience of people affected by it. It might be the case that both, the activation and the measurement, require a much greater degree of specificity than the ones used in this study. These explanations are of course highly speculative and cannot be confirmed within this analysis. However, they may still function as a valuable reminder of the still underexplored complexities within the research about the effects stereotypes can have on people and hopefully help to inspire future research into these complexities.

The Speech-Based Outcomes

While the primary focus of this research was on contrasting the effects of implicit and explicit forms of stereotype threat manipulation, the speech-based outcomes provide valuable

insights that may inspire further research. An important question that this study touches on is whether changes in self-perception due to stereotype threat lead to corresponding changes in behavior and performance.

Word Count

Although total word count did not reach statistical significance, post-hoc tests revealed significant differences between the implicit on the one hand, and the explicit and semi-explicit condition on the other hand, showing the predicted pattern: a higher value in the explicit and semi-explicit condition and a lower value in the implicit condition. While word count is a crude measure, within the context of this study, it can be interpreted as an indicator of "applied sociability" or motivation to engage. It seems plausible that using more words when asked to relate a story about a recent encounter can be seen as greater motivation to tell the story, indicating increased social engagement. Notably, the word count follows a pattern similar to that of the social experience composite outcome, suggesting that behavior may indeed align with changes in self-perception.

Moving Average Type-Token Ratio (MATTR)

In contrast, the MATTR did not yield significant results or even the predicted pattern of increase and decrease. MATTR was intended to measure actual speech performance to contrast it with self-assessments, including self-reported communication competency. While it is possible that speech performance was unaffected by stereotype threat and resulting changes in self-perception, another explanation seems more likely. The MATTR scores were not only insignificant but also displayed a pattern that differed from all other results. The implicit and explicit condition showed higher scores, while the semi-explicit condition had the lowest score, with differences approaching significance in post-hoc tests. Given that MATTR was only one of several criteria used by Gordon et al. (2019) to construct their measure of speech performance, this suggests that it may have been an insufficient measure of speech performance on its own. Therefore, the results could be due to factors not considered in this study or simply statistical noise.

LIWC-Based Outcomes: Tone and Health

The final two outcomes were derived from the LIWC program, representing a relatively novel approach to investigating stereotype threat, as only a few studies have used this method thus far. While tone did not reach significance, it exhibited the predicted pattern of decrease across all experimental conditions, with the implicit and semi-explicit condition showing the lowest scores. The lower tone scores across all experimental conditions are noteworthy because they mirror the results of the manipulation check. Given that tone reflects

the speaker's emotional state (Boyd et al., 2022), and stereotype threat is associated with negative emotions (Schmader et al., 2008), the generally higher level of negative emotions in all experimental conditions provides additional support for the effectiveness of the manipulations, even though the manipulation check itself failed to reach significance. The lowest tone score in the semi-explicit condition is particularly interesting, as both age and education were shown to have a significant negative impact on tone. Given that participants in this condition were the second youngest and least educated group, this might suggest that the manipulation had a stronger effect in this group. As discussed earlier, the ambiguity in the semi-explicit condition's presentation may have heightened the stereotype threat effect compared to the explicit condition.

The final LIWC outcome was health, which measured the frequency of health-related vocabulary used by participants. Although health narrowly missed reaching significance in the ANOVA, it followed the predicted pattern, and one post-hoc comparison (semi-explicit vs. control) was significant. The topic of health was evidently more salient in the minds of participants in the explicit and semi-explicit condition. The slightly higher score in the semi-explicit condition may again be attributed to the ambiguity of the presentation, which may have made the topic even more prominent in participants' minds compared to the straightforward presentation in the explicit condition. The fact that the implicit condition did not show elevated use of health-related vocabulary suggests that the stereotype activation was indeed below the level of consciousness, as many of the trigger words in the scrambled-sentence task were related to health. Conversely, the elevated use of health-related vocabulary indicates that the topic of health was activated in the minds of participants, likely contributing to the small but present contrast effects observed.

The Role of Age and Education

Age and education have been considered as potential influences within a variety of studies about old age stereotypes, albeit with inconsistent results. The present research considered a variety of outcomes in which the role of age and education differed. In the two composite outcomes age and education had a greater influence than the manipulation and their inclusion decreased the influence of the manipulation condition. In three outcomes (wordcount, tone, health) the inclusion increased the influence of the manipulation condition. Age turned out to be a significant negative influence of its own in two outcomes (self-assessment and tone) and approaching significance (negative) in influence on social experience. Education had a significant influence on three outcomes, with having a positive influence on two (self-assessment and wordcount) and negative influence on one (tone)

outcome. This analysis did not test for moderation effects, and it can therefore not be said how age and education interact with the stereotype manipulation. The generally negative impact of age on the different outcomes should not be overstated, considering the participants in the implicit condition were the oldest, and even significantly older than the people in the information condition. The fact that the implicit manipulation also led to lower outcomes might have caused the impact of age to appear larger than it really is.

By contrast, the impact of education is more noteworthy, considering the participants in the implicit condition were the most educated and education still had a positive impact on two outcomes. While it cannot be concluded that education can dampen the effects of stereotype threat, it does at least not seem to increase the vulnerability to it, as some previous research has suggested it would (Hess, Hinson & Hodges, 2009). Taken together both age and education seem to be important confounding variables. Some of the inconsistent results of previous research may come from the fact that their impact and influence is outcome specific and can therefore not be generalized across stereotype threat outcomes. Because their influence may vary not only according to the outcome that is assessed, but also according to the specific type of manipulation that is used, age and education should generally be taken into consideration in research of this kind.

The Moderator Analysis

This research found no evidence of moderation by the attitudes regarding old age which people bring with them. This does however not prove that the attitudes exert no influence. The lack of moderation may be due to the fact that the present study was not well designed for this kind of analysis. It was predicted, and at least partially confirmed, that the experimental condition produces different kinds of effects and that the effects will go in different directions. Since the effects that the manipulation conditions produced differ arguably also in kind, possible moderation effects might therefore also differ across the different experimental conditions. Unsurprisingly, it was the self-assessment composite, the outcome with the clearest overall effect, that came the closest to show moderator effects as well. The positive regression coefficient does suggest, as predicted in the theory section, that a higher score and therefore more positive valence in the identification task encourages higher scores in the outcome. This suggests that a more positive view of one's age might indeed dampen assimilation and enhance contrast effects. However, given the generally small effect sizes, particularly the small contrast effects, the moderator analysis within this study remains unable to confirm this effect. While one may at least see the potential for moderation in the self-assessment outcome, the other outcomes show no sign of moderation at all. Future

research into the role of internalized attitudes and their impact on the susceptibility to stereotypes may however still be valuable.

Limitations

When analyzing and interpreting the results, certain limitations must be considered, which increase both the probabilities of Type I and Type II errors. Given the small effect sizes, the sample size was insufficient for this analysis. The sample itself has the problem that one group (implicit condition) was significantly older than another (explicit condition). Given that age has its own impact on some of the outcomes, this complicates the interpretation of the results. Furthermore, the material which was used to induce the stereotype threat in the explicit manipulation conditions had a particular relevance for the situation of older adults in Austria. Given that not all subjects were Austrian citizens or residents, this may have affected the results in these manipulations. Additionally, the material in the implicit condition was not specifically tested prior to use, but partially taken from another study. The material used for the control group was arguably also not truly neutral, as it was partially focused on climate change. Because climate change is an important and controversial contemporary political issue, this may have caused the material to be emotionally charged. What is more, the sheer volume of questionnaires, followed by a prompt to tell a story about a recent interaction, also had the risk of creating fatigue in the participants. Particularly the story prompt came only about twenty to thirty minutes after the actual manipulation. Considering a review by Riboni and Pagnini (2021) found that age-related stereotypes showed potentially stronger effects when they are temporally closer to the test of performance, this bears the risk that some of the manipulation effect had “evaporated” at the point of testing. Moreover, some of the questionnaires included in the self-assessment composite can also be called into question. For example, self-assessed communication competence stood out for having below ideal reliability scores, as only a portion from the original scale was used. Satisfaction of basic psychological contained questions regarding the sense of relatedness, which arguably could also be included in the social experience composite. While both the self-assessment and the social experience composite showed acceptable reliability scores, their construction was a novel approach and had no basis in previous literature. Finally, communication competence measured by moving average type token ratio also only has a weak basis in previous literature and may by itself not actually be an adequate tool to measure communication competency. In the meantime, a replication study was completed which may help to ameliorate some of the shortcomings of this analysis.

Implications for Future Research

Even with limitations considered, this study may still provide valuable inspiration for future research. A lot of the existing literature on stereotype threat suffers from an inconsistent use of terminology, mainly due to an underlying assumption that stereotype threat is a singular phenomenon. Different types of stereotypes, however, presented in a different way to different people may have different effects. The multi-threat framework by Shapiro and Neuberg (2007) is a valuable first step to try to systematize the subcategories of stereotype threats and their possible defense mechanisms. However, the model still needs to be more empirically substantiated as well as expanded to include factors such as awareness. A better understanding of the subcategories of stereotype threat and their various effects may open up new ways to conduct research into the underlying mechanisms of stereotype threats. The possibility to deliberately create contrast effects may be particularly useful. For example, two different experimental conditions could be used, one designed to create contrast and one designed to create assimilation effects. Afterwards a self-assessment and a corresponding performance outcome could be measured. It would be interesting to see how contrast effects in self-assessment translate into performance outcomes. If a contrast in self-assessment would be followed by a decrease in performance, this would lend additional weight to the theory that stereotype threat primarily comes from executive resource depletion. The contrast effects could then be interpreted as a coping mechanism which takes resources away from the performance task. If contrast effects were followed by a non-effect or even an analogous contrast effect in the performance task, this might help to show that stereotype threat effects are motivational and about changes in the self-image. Either way, such a deeper understanding may better help to devise practical ways to counteract the harmful effects stereotypes can have on people.

Given the well documented harm, which particularly old age stereotypes can do to health outcomes, finding ways for people to protect themselves is an important and worthwhile pursuit. Generally, future research should continue to broaden the scope of the impact stereotypes can have beyond the narrow focus on performance measures, to impacts on self-image, behavior, and social experience. The use of the LIWC program may be a useful asset in widening the focus, especially in combination with a more nuanced understanding of the different kinds of stereotype manipulation. Using this tool allows for creative experimental designs and a wide variety of outcomes, including those centering around “attentional focus, emotionality, social relationships, thinking styles, and individual differences” (Tausczik & Pennebaker, 2010, p.24), which are of great interest for a more

holistic understanding of the impact of stereotypes. When it comes to self-assessments in particular, this research has given additional reasons for considering age and education as important factors, be it as moderators or as covariates. Given how easy age and education are to ascertain, the inclusion of these variables into future analyses should be considered as a quality standard. While the inclusion of attitudes regarding old age prior to the manipulation did not turn out any results, this may have been due to shortcomings in the research design and a small sample size. As there are good theoretical reasons to believe that these attitudes matter, it would still be worthwhile to include them in future research, specifically in conjunction with a more nuanced understanding of stereotype induction, which this research hopes to help inspire.

Conclusions

The primary aim of this research was to contrast different forms of stereotype threat manipulations, with a particular focus on conscious versus unconscious forms. The predicted difference in effect direction was confirmed, though only the self-assessment composite reached significance, while the social experience composite did not. The larger effect on self-assessment followed expectations in accordance with the stereotype matching effect. The effect of the implicit condition appeared to be stronger than those in the explicit and semi-explicit condition, which supports previous findings on the superior effectiveness of implicit and stereotype-based manipulations.

Furthermore, this research aimed to contribute to a more nuanced understanding of stereotype threat. As expressed in the multi-threat framework by Shapiro and Neuberg (2007), stereotype threat can be differentiated into various sub-phenomena depending on the source and target of the threat. The role of awareness of the stereotype might be a valuable addition to this model. This study offers further confirmation that older adults can successfully guard themselves against changes in their self-perception, after being confronted with stereotypes.

Whether this actually is “good news” as Pinquart (2002, p.317) proclaimed, remains to be seen. The successful defense seems to require a sufficient level of awareness and does not work against more subtle and subconscious forms of stereotyping, which therefore can still impact people negatively. While it has been reaffirmed that stereotype threat induced by blunt means can even lead to overcompensation in the form of contrast effects, it remains an open question, whether or not this overcompensation comes with a price, for example in the form of resource depletion for actual task performance. The ability to deliberately create contrast effects could inform the design of future research into the cognitive mechanisms underlying stereotype threat.

Additionally, the use of LIWC software in this study may offer inspiration for future research. While the LIWC outcomes mostly failed to reach significance, they also mostly followed the predicted patterns and therefore still aided in the interpretation of the data. Wordcount suggested that behavior might indeed follow changes in self-perception, while tone and health indicated that even the positive changes come at a price of heightened and potentially health related negative emotion.

While this research did not find moderator effects for internalized attitudes regarding old age, this does not mean that such effects do not exist, as this study was ill-designed to find them, given the differences in effect direction of the experimental conditions. Future research should be more carefully designed to investigate this particular question. Age and education have been confirmed as important potential confounding variables in research of this kind.

In sum, this research hopes to make a meaningful contribution to the layered understanding of stereotype threat. By illuminating the subtleties of this phenomenon, studies like this can inform the development of interventions to shield individuals from the detrimental effects of stereotypes. This demands an in-depth, evidence-based understanding of stereotype threat in all its complexity - an endeavor this research aspires to advance. Building such protections ought to be the ultimate goal of research into stereotypes and the harm they cause. The fact that sufficient awareness may, at least in part, shield people from the harmful effects of stereotypes seems cause for hope. It also reaffirms Lippmann's (1922/1998), original insight into stereotypes, when he first described them as preconceptions which "unless education has made us acutely aware, govern deeply the whole process of perception" (p.90). Maybe education, informed through research-based understanding of the impact stereotypes have, can help us to be more mindful, even of the more subtle ways stereotypes can be presented, and therefore help us to protect us from them as well. Perhaps we just need to learn to be a little more aware.

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Appendix A

Podcast Text

“Ausschnitt aus einem Podcast”

In unserem Podcast zum Thema „Psychologie des Alterns“ haben wir nun ein Interview mit einer Forscherin auf dem Gebiet der Alterspsychologie für euch vorbereitet. Diese wird uns Fragen zu der Entwicklung älterer Personen beantworten und einen Einblick in die Thematik und den aktuellen Wissensstand geben.

A: Liebe XX, vielleicht kannst du uns mal einen Einblick in die Relevanz dieses Themas geben.

B: Unsere Gesellschaft wird immer älter und daher ist es wichtig auch ein Augenmerk auf die ältere Bevölkerung zu richten. Um das Altern so angenehm wie möglich gestalten zu können, müssen unter anderem auch die negativen Konsequenzen des Alterns betrachtet werden. Laut der Statistik Austria gab es 2020 einen Anteil von 19,1% der über 65-jährigen Bevölkerungsgruppe, laut Prognosen soll dieser Wert 2050 auf 27,6 % ansteigen.

A: Das ist ein Zuwachs von fast 10%. Was bedeutet das für unsere Gesellschaft?

B: Mit dem Zuwachs der älteren Bevölkerung steigt auch der Bedarf an Pflegekräften. Momentan sieht es so aus, dass 82% der über 80-Jährigen an chronischen Gesundheitsproblem leiden und circa die Hälfte der über 85-Jährigen sind pflegebedürftig, da ein höheres Lebensalter mit einem Rückgang der Selbstständigkeit einhergeht. Um ein konkretes Beispiel zu nennen, in Oberösterreich liegt der Anteil der Personen, die Hilfe bei persönlichen Verrichtungen wie Waschen und Anziehen benötigen, bei einem Viertel der über 75-Jährigen.

A: Ok, die Zahlen sind echt hoch, aber das ist eh bekannt, dass im Alter die körperlichen Fähigkeiten nachlassen. Gibt es noch andere Bereiche, die im Alter Beeinträchtigungen erfahren? (Beziehungsweise kannst du uns spezifische Bereiche nennen und auch Beispiele dafür?)

B: Ja, die gibt es tatsächlich und die haben auch schwerwiegendere Auswirkungen auf das Leben. Im Alter sind die Hirnfunktionen zunehmend eingeschränkter, das bezieht sich vor

allem auf die Selbstkontrolle und die Verarbeitungsgeschwindigkeit. Nach dem 60. Lebensjahr steigt auch leider die Wahrscheinlichkeit für Demenz stark an und verdoppelt sich alle 5 Jahre. Bei den über 90-Jährigen ist sogar ein Drittel davon betroffen.

A: Wow, das sind wirklich beachtliche Zahlen.

B: Ja das stimmt, aber die Forschung zielt immerhin genau darauf ab, das Leben im Alter besser zu verstehen und gezielte Maßnahmen einleiten zu können. Zurzeit werden ältere Menschen von anderen als sprachlich eingeschränkt, unsicher in sozialen Interaktionen und schüchtern beschrieben. Das hat natürlich einen Einfluss auf das soziale Erleben und den Umgang mit anderen Personen. Das heißt aber nicht, dass es sich nicht zukünftig verändern kann. Mit dem wachsenden Wissen über die ältere Gesellschaft kann sich vielleicht auch das Bild über diese Bevölkerungsgruppe verändern.

A: Mit dem steigendem gesundheitlichen Risiko und dem Bedarf an sozialer Unterstützung gehen ja auch unheimlich viele Kosten einher. Inwieweit können ältere Personen die dafür nötigen Mittel aufbringen?

B: Das lässt sich nicht so vereinfacht darstellen, dazu fehlen mir die genauen Daten zu Pension und Lebenserhaltungskosten. Aber es lässt sich durchaus feststellen, dass, wenn ich mich recht erinnere, ca. 11% der über 65-Jährigen einem Armutsrisiko ausgesetzt sind.

A: Wow, du hast uns heute echt viele Zahlen genannt, hoffentlich können sich unsere Zuhörerinnen und Zuhörer persönlich etwas daraus mitnehmen. Ich verstehe jetzt auf jeden Fall, wie wichtig es ist, weiter auf dem Gebiet der Alterspsychologie zu forschen. Vielen Dank für deine spannenden Einblicke. Wir wünschen dir viel Erfolg für deine weitere Forschung und würden uns freuen, dich bald wieder im Podcast begrüßen zu dürfen.

Appendix B

Quiz – Instruction (or semi-explicit) Condition

Wir möchten Sie nun bitten, das folgende Quiz zu beantworten. Lesen Sie die Quizfragen aufmerksam durch. Beantworten Sie die Fragen durch die Auswahl einer oder mehrerer Antworten.

1. Mit dem Alter mehren sich die Gebrechen. Was denken Sie: Wie viel Prozent der über 80-Jährigen geben an, dass sie an chronischen Gesundheitsproblemen leiden?
 - a) 82 Prozent ☐
 - b) 74 Prozent ☐
 - c) 68 Prozent ☐

2. Der Verlust der Selbständigkeit ist eine unabdingbare Begleiterscheinung des hohen Alters. Wie groß ist der Anteil der Pflegebedürftigen unter den über 85-Jährigen?
 - a) 38 Prozent ☐
 - b) 46 Prozent ☐
 - c) 42 Prozent ☐

3. Nach dem 60. Lebensjahr steigt die Häufigkeit von Demenz sprunghaft an und verdoppelt sich alle 5 Jahre. Wie viele Menschen über 90 sind dement?
 - a) Ein Drittel ☐
 - b) Die Hälfte ☐
 - c) Ein Fünftel ☐

4. Altern ist nicht nur mit gesundheitlichen Verlusten verbunden, sondern auch mit ökonomischen Einbußen. Was denken Sie: Wie hoch ist das Armutsrisiko für Menschen über 65?
 - a) Ca. 4 Prozent ☐
 - b) Ca. 23 Prozent ☐
 - c) Ca. 11 Prozent ☐

5. Im Alter sind die Hirnfunktionen zunehmend eingeschränkt. Welche Funktionsbereiche sind betroffen?

- a) Selbstkontrolle ☐
- b) Weisheit ☐
- c) Verarbeitungsgeschwindigkeit ☐

6. Wie hoch ist der Anteil der über 75-jährigen Menschen in Oberösterreich, die Hilfe bei persönlichen Verrichtungen (z.B. Ankleiden, Waschen etc.) benötigen?

- a) 5-6% ☐
- b) 18-19% ☐
- c) 22-23% ☐

7. Menschen bewerten ältere Personen tendenziell als...

- a) ...sprachlich eingeschränkt. ☐
- b) ...unsicher in sozialen Interaktionen. ☐
- c) ...schüchtern. ☐

Appendix C

Scrambled Sentence Task – Implicit Condition

Bitte schauen Sie sich die folgenden Wortgruppen an. Bilden Sie aus den Wörtern jeweils einen sinnvollen Satz. Benutzen Sie dabei jeweils **nur vier** der fünf aufgelisteten Wörter.

Ein Beispiel: Getränk, der, neutral, Staat, ist

→ Der Staat ist neutral.

1. die, Mutter, krank, Wolken, war

2. Gabi, sehr, sie, schwach, ist

3. Abhängigkeit, ist, gemeinsam, die, schlecht

4. hilfsbedürftig, ist, Neugeborene, das, Löffel

5. ist, vergesslich, Internet, sehr, Peter

6. verwirrt, zur, ist, manchmal, Anne

7. Worte, erschienen, diese, Frauen, arm

8. Worte, Mann, erschien, der, elend

9. Gesicht, mürrisch, ist, das, Herz

10. Kleidung, die, verblasst, langsam, Farbe

11. täglich, Pflege, blieb, vermittelt, wird

12. abgenutzt, war, Buch, das, Schnee

13. unsicher, Straßen, die, Gericht, sind

14. wurde, Land, eingeschränkt, diese, Person

Appendix D

Quiz – Control Group

Wir möchten Sie nun bitten, das folgende Quiz zu beantworten. Lesen Sie die Quizfragen aufmerksam durch. Beantworten Sie die Fragen durch die Auswahl einer oder mehrerer Antworten.

1. Die Erde besteht zu 70,7% aus Wasser. Trinkbares Wasser ist eine wichtige Ressource. Wie hoch ist der Trinkwasseranteil am weltweiten Wasservorkommen?
 - a) 0,3 Prozent ☐
 - b) 23 Prozent ☐
 - c) 7 Prozent ☐

2. Pflanzen, insbesondere Wälder, tragen zur Stabilisierung unseres Klimas bei. In Österreich sind primär Mischwälder zu finden. Dabei ist der Anteil an Nadelbäumen bedeutend für das hiesige Klima. Wie hoch ist der Anteil der Nadelbäume?
 - a) 46 Prozent ☐
 - b) 30 Prozent ☐
 - c) 80 Prozent ☐

3. Auf Grönland ist der Klimawandel besonders zu beobachten. Forscher*innen befürchten, dass das Inlandeis auf der Polarinsel Grönland bei einem weiteren Temperaturanstieg komplett zu schmelzen droht. Wie stark ist der Temperaturanstieg auf Grönland?
 - a) -10 °C auf 5 °C ☐
 - b) -3 °C auf 0 °C ☐
 - c) 0,6 °C auf 2 °C ☐

4. In jüngster Zeit wird CO₂ als Treibhausgas diskutiert. Wie hoch ist die CO₂-Konzentration in der Luft?
- a) 0,038% ☐
 - b) 13% ☐
 - c) 27,2% ☐
5. Veränderungen im Klima bedeuten auch immer existenzielle Veränderungen in den Lebensräumen vieler Tiere. Welches der folgenden Tiere stammt nicht aus Mitteleuropa?
- a) Wolf ☐
 - b) Dingo ☐
 - c) Weinbergschnecke ☐
6. Der Klimawandel kann zu einem Rückgang der Gletscher führen. Welcher ist der größte Gletscher der Alpen?
- a) Aletsch-Gletscher ☐
 - b) Pasterze ☐
 - c) Zugspitzplatt ☐

Appendix E

Identifikation Task

Im Allgemeinen machen die meisten Menschen ähnliche Erfahrungen mit dem Älterwerden. Uns interessiert nun, was in Bezug auf typische Merkmale des Alterns auf Sie zutrifft: Was haben Sie mit typischen alten Menschen gemeinsam? Bitte beschreiben Sie im Folgenden, in welchen Merkmalen Sie typischen alten Menschen ähnlich sind.

Bitte erläutern Sie in **drei** kurzen Sätzen, welche Gemeinsamkeiten Sie mit alten Menschen haben.

1.

—

2.

—

3.

Appendix F

Manipulation Check

Es gibt viele Vorurteile über ältere Menschen. Uns interessiert, wie Sie diese Vorurteile wahrnehmen.

[illegible]

Appendix G

Satisfaction of Basic Psychological Needs

Wie erleben Sie Ihren Alltag?

In meinem Alltag ...

[illegible]

Appendix J

Attitudes Towards Aging

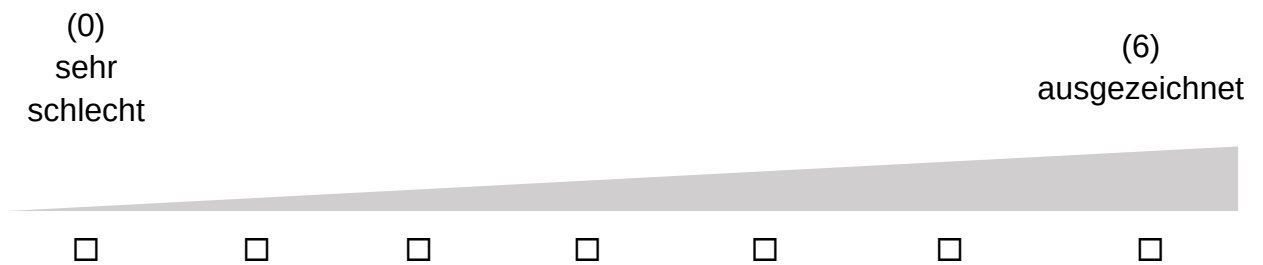
Hier geht es darum, wie Sie **Veränderungen, die mit dem Alter einhergehen können**, erleben. Bitte geben Sie an, inwieweit die folgenden Aussagen auf Sie persönlich zutreffen.

[illegible]

Appendix K

Mental Health

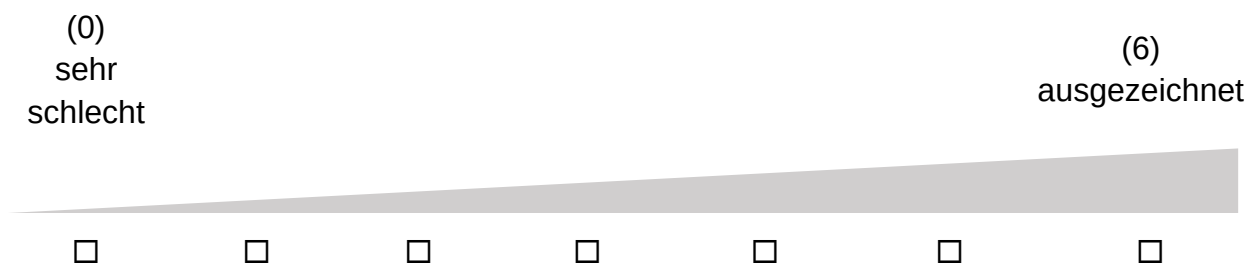
Wie würden Sie Ihren gegenwärtigen psychischen Gesundheitszustand einschätzen?



Appendix L

Physical Health

Wie würden Sie Ihren gegenwärtigen körperlichen Gesundheitszustand einschätzen?



Appendix M

Feeling of the Last Three Months

Zuletzt möchten wir wissen, wie Sie sich während der letzten 3 bis 4 Monate gefühlt haben. Kreuzen Sie jeweils den Wert an, der das am besten beschreibt.

[illegible]

Appendix N

Sense of Belonging

Denken Sie bitte kurz an **Ihre Stellung in der Gesellschaft**. Beantworten Sie dann folgende Fragen.

Wenn ich an meine Stellung in der Gesellschaft denke, ...

[illegible]

Appendix O

Social Approach and Avoidance Motivation

Nun stellen wir Ihnen einige **soziale Ziele** vor, die typischerweise im Alltag verfolgt werden. Bitte geben Sie an, inwiefern Sie die folgenden Ziele verfolgen.

[illegible]

Appendix P

Social Self-Esteem

Wie beurteilen Sie **Ihr Verhältnis zu anderen Menschen**?

[illegible]

Appendix Q

Social Anxiety

Wie beurteilen Sie **sich selbst in Bezug auf andere Menschen?**

	(0) stimmt gar nicht		(6) stimmt genau
			
1. Manchmal fürchte ich, Falsches zu tun oder zu sagen.	☐	☐	☐
2. Ich bin beunruhigt darüber, welchen Eindruck ich auf jemanden mache.	☐	☐	☐
3. Ich fürchte, dass andere mich nicht anerkennen.	☐	☐	☐
4. Wenn ich mich mit jemandem unterhalte, mache ich mir Sorgen, was der andere von mir denkt.	☐	☐	☐
5. Ich verspüre Unbehagen bei Leuten, die meine Schwächen bemerken.	☐	☐	☐

Abstract

Background. *Stereotype threat* is a widely researched phenomenon, including research about old age stereotypes. While the bulk of research has focused on the impact on performance measures, the impact on self-assessment, behavior and social experiences has also been gaining interest. Various different methods to induce stereotype threat exist and have been used in research. These methods differ in effect size but may also create effects which differ in other ways. The *multi-threat framework* is a first theoretical attempt to differentiate between these effects, by categorizing according to the source and target of the threat. A neglected factor may be the level of awareness of the threat. It is hypothesized that implicit and explicit stereotype activation can produce effects, which not only differ in degree, but in direction, because conscious awareness of the stereotype can lead to contrast effects, whereas unconscious activation leads to assimilation effects. Because of the *stereotype matching effect*, the impact is expected to be strongest in outcomes closely related to the material used to induce the threat. Attitudes regarding old age, which people have already internalized, may moderate this effect. Age and education are considered as additional influences on the outcomes.

Method. The sample consisted of $N = 128$ individuals (51 men, 77 women) between 59 and 94 years of age ($M = 70.35$ years). This was a between-subjects design with an explicit, a semi-explicit and an implicit experimental group, as well as one control group. The independent variable was the experimental condition. The dependent variables were two composite variables based on a variety of questionnaires, one centering around self-assessment, the other around social experience. In addition, four speech behavior-based outcomes were considered. An identification task was rated for valence and used for a moderator analysis.

Results. Self-assessment showed significant effects with the predicted pattern of assimilation vs. contrast, whereas social experience showed only the predicted pattern, but no statistical significance. The speech-based outcomes generally lacked statistical significance, but still aided the interpretation of the overall findings. No evidence of moderation was found. Age and education were affirmed as important factors to consider in research of this kind.

Conclusions. Although the results were more subtle and nuanced than expected, stereotype awareness seems to be an important factor in the effect produced by manipulations. Stereotype threat may not be a singular phenomenon but one consisting of several

subcategories that differ in subtle ways. Future research should further investigate the implications of this finding.

Keywords: stereotype threat, old age stereotypes, multi-threat framework, implicit vs. explicit manipulation

Abstract Deutsch

Hintergrund. *Stereotype threat* ist ein weithin erforschtes Phänomen, welches auch Forschung über Altersstereotype umfasst. Der Großteil der Forschung hat sich auf den Einfluss auf Leistung konzentriert, aber auch der Einfluss auf Selbstwahrnehmung, Verhalten und soziales Erleben bekommt wachsende Aufmerksamkeit. Es existieren verschiedenste Methoden, um *stereotype threat* auszulösen, welche auch Anwendung in der Forschung finden. Diese Methoden unterscheiden sich in ihrer Effektgröße aber möglicherweise auch in den Effekten selbst. Das *multi-threat framework* ist ein erster theoretischer Versuch diese Unterschiede zu kategorisieren, nach Quelle und Ziel der Bedrohung. Ein bisher unbeachteter Faktor könnte der Grad des Bewusstseins für die Bedrohung sein. Es wird vermutet, dass implizite und explizite Manipulationen unterschiedliche Effektrichtung erzeugen können, da bewusste Wahrnehmung der Bedrohung Kontrasteffekte erzeugen kann. Wegen des *stereotype matching effects* sollte der Einfluss am größten bei jenen Variablen sein welche einen direkten Bezug zu dem Manipulationsmaterial haben. Einstellungen zum Alter, die die Versuchspersonen bereits internalisiert haben, könnten den Effekt moderieren. Alter und Bildungsniveau werden als zusätzliche Einflüsse in Betracht gezogen.

Methode. Die Stichprobe bestand aus $N = 128$ Personen (51 Männer, 77 Frauen) zwischen 59 and 94 Jahren ($M = 70.35$ Jahre). Es handelte sich um ein between-subjects design einer expliziten, einer semi-expliziten und einer impliziten Experimentalgruppe sowie einer Kontrollgruppe. Die unabhängige Variable war die Kontrollgruppe. Die abhängigen Variablen waren zwei, aus mehreren Fragebögen zusammengesetzte, Variablen. Davon bezieht sich eine vor allem auf Selbstbeurteilung, die andere auf das soziale Erleben. Zusätzlich werden vier Variablen analysiert, die auf Sprachverhalten beruhen. Eine Identifikationsaufgabe wurde auf ihre Valenz hin bewertet und für eine Moderator Analyse verwendet.

Ergebnisse. Selbstwahrnehmung zeigte signifikante Unterschiede mit dem vorhergesagten Muster, soziales Erleben lediglich das Muster ohne statistische Signifikanz. Die sprachbasierten Variablen waren generell nicht statistisch signifikant, aber dennoch hilfreich für die Interpretation der Daten. Es wurden keine Moderationseffekte gefunden. Alter und Bildungsniveau wurden als wichtige Einflüsse bestätigt.

Schlussfolgerung. Obwohl die Ergebnisse subtiler und nuancierter waren als erwartet, scheint sich Bewusstsein der Bedrohung als wesentliche Einflussgröße bestätigt zu haben. *Stereotype threat* ist womöglich kein singuläres Phänomen, sondern besteht aus mehreren Unterarten, die

sich auf subtile Art unterscheiden. In zukünftiger Forschung sollte den Implikationen weiter nachgegangen werden.

Keywords: Stereotype threat, Altersstereotype, multi-threat framework, implizite vs. explizite Manipulation