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Images of Aging Are Related to the Plasticity of Adult Development

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'Our age? Ha! You at your age, me at mine.'

-Ingeborg Borg

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Chapter 1

General Introduction

Somewhat ironically, human fascination with old age and the aging process seems to be itself...ageless. Across history, artists, writers, philosophers and more recently magazine, television and other modern media producers have depicted age and aging in written and visual works of art and other media. Across their lifetimes, people form (and modify) their own ideas about what it means to age and to be old. To a certain extent, these 'images of aging' are representations of reality. However, the word 'image' emphasizes a focus on the *subjective* interpretation of old age and aging, "an impression or incomplete rendition governed by interpretative framing" (Featherstone & Hepworth, 2005, p. 355), as opposed to an accurate copy of reality. The idea that people have their own individual subjective interpretations of age and aging is well reflected in how a 79 year old friend of mine responded to a similarly-aged acquaintance of hers who said, 'We shouldn't do this at our age'. My friend retorted '*Our* age? Ha! *You* at *your* age, *me* at *mine*.' As this anecdote nicely illustrates, psychological images of aging—mental pictures of what is, what should be, and what could be at different ages and with increasing age—vary widely between people (e.g., Kotter-Grühn, Kleinspehn-Ammerlahn, Gerstorf, & Smith, 2009; Levy & Langer, 1994, Levy, Slade, & Gill, 2006). These subjective, psychological images of aging are both affected by—and more interesting from the standpoint of this dissertation—also affect the individual experience of aging. In fact, there is some indication that subjective images of aging affect the aging experience (e.g., in terms of health) more so than the other way around (Wurm, Tesch-Römer, & Tomasik, 2007).

For some time now, the effects of images of aging especially on older people's functionality and development have captured the attention of social science researchers. A number of studies have demonstrated how contextual reminders of a (negative) age stereotype can affect acute functionality. For example, subliminal priming of positive or

negative age stereotypes with older adult participants has resulted in variations in memory performance (Levy, 1996; Stein, Blanchard-Fields, & Herzog, 2002), variations in the shakiness and clarity of handwriting (Levy, 2000), variations in walking speed and swing time (Hausdorff, Levy & Wei, 1999), variations in cardiovascular responses to stress (Levy, Hausdorff, Hencke, & Wei, 2000; Levy, et al., 2008) and even variations in the will to live (Levy, Ashman, & Dror, 1999-2000). Several researchers have also demonstrated that activating a stereotype from situational cues can affect older adults' memory performance (Chasteen, Bhattacharyya, Horhota, Tam, & Hasher, 2005; Hess, Auman, Colcombe, & Rahhal, 2003; Hess, Hinson, & Statham, 2004; Rahhal, Hasher, & Colcombe, 2001) and general cognitive performance (Abrams, Eller, & Bryant, 2006). As an example of the findings within this literature, manipulating task instructions to downplay the salience of an age stereotype can affect how well adults' actually perform on the task. Younger adults typically perform better on memory tasks than older adults. However, reframing a memory task as a 'general knowledge task'—without changing the actual task content—can eliminate such age differences (Rahhal et al., 2001). However, reminding people of an age stereotype or—as in the previous example, reframing a situation such that it does *not* remind people of an age stereotype—does not always lead to consistent, predictable results. It seems that the stereotype models developed primarily from experimental paradigms and studies of race and gender stereotypes and relatively homogenous samples (i.e., first-year psychology students) are insufficient for predicting how age stereotypes—which, unlike race and sex stereotypes, eventually apply to everyone if they don't already—affect adults. The inconsistencies in this literature point to the need for a more complex model of how age stereotypes affect adults' acute functionality that also takes into account age-related changes. (The inconsistent results, and possible explanations for them, will be reviewed in Chapter 5.)

Research findings with regards to the relationship between how people feel about their *own* aging process and their long-term health and longevity have been more consistent. For instance, the relationship between perceptions of the aging experience and longevity

has by now been replicated within the literature (Kotter-Grühn et al., 2009; Levy, Slade, Kunkel, & Kasl, 2002a; Maier & Smith, 1999). Amazingly, in one study, how people felt about their own aging predicted longevity differences of 7.6 years (median value; Levy et al., 2002a). All the more astounding is when one compares the 7.6 'added years' associated with positive perceptions of one's own aging with recent figures on the 'added years' associated with abstaining from cigarette smoking (4.3 years for men, 4.1 years for women) and high levels of physical activity (3.5 years for men, 3.4 years for women) (Nusselder, Franco, Peeters, & Mackenback, 2009). Images of aging appear to affect developmental outcomes, such as health or longevity, via multiple routes, including behavioral, psychological and physiological pathways (Levy, 2009). Studies have demonstrated that the effects of subjective perceptions of one's own aging on health cannot be fully accounted for by either general neuroticism (Moor, Zimprich, Schmitt, & Kiegel, 2006) or control beliefs or hope (Wurm et al., 2007). However, as with the literature concerning the acute effects of images of aging, theoretical explanations for *how* images of aging translate into developmental trajectories have been somewhat lacking in the literature. Existing discourse has tended to either focus on one process at a time (e.g., age stereotypes as the basis for self-enhancing comparisons, Heckhausen & Krueger, 1993) or to be rather superficial (e.g., Levy, 2009). Again, there is a gap in the literature with regards to a *meta*-theoretical framework that integrates the various processes of how images of aging affect adult development.

Another gap in the images of aging literature concerns images of aging specifically within the work context. There is by now sufficient evidence to say that people also associate specific characteristics with older workers, even though 'older' workers are rather young in the grand scheme of things: depending on the country, workers are already considered 'older' somewhere between about 45 to 60 years (Harper, Khan, Saxena, & Leeson, 2006). Older workers are generally thought to be more dependable than younger workers, but are also expected to perform worse, resist change and learn less easily relative to their younger colleagues (Posthuma & Campion, 2009).

From an adult developmental perspective, the images of aging within the work context are interesting because features of and experiences in the work context have been shown to influence working adults' personality and cognitive development, including the incidence of dementia (for a review, see Bowen, Noack, & Staudinger, in press). It seems likely that the images of aging in the work context also influence adult development. Images of aging in the work context are also interesting from an organizational and societal perspective. It is widely assumed that (negative) beliefs about older workers are a boundary to the aims of organizations and society to increase the productivity of an aging workforce, including increasing the participation of older adults and extending the average working life, measures that are in many countries necessary in order to keep social welfare systems financially viable (Organisation for Economic Co-operation and Development [OECD], 2006). Both the OECD and European Council have underlined the importance of changing age-related attitudes within organizations as one of the critical dimensions for improving employment for older workers (Eurolink Age, 2000; OECD, 2006). In particular, aging-related beliefs have been assumed to lie behind low participation rates of older workers in further training and developmental activities (Maurer, Andrews, & Weiss, 2003) as well as the relatively low participation rates of older adults in the workforce due to biased hiring and firing rates (OECD, 2006). Despite these widespread assumptions, to date there has been relatively little *empirical* evidence directly linking age-related beliefs, including beliefs about older workers, with either developmental or work-related outcomes.

One promising concept that has to date received little empirical attention is working adults' *perceptions* of the how older workers are regarded in their work context. Research on meta-stereotypes, that is, people's beliefs about how other people perceive their social group (Vorauer, Main, & Connell, 1998), has demonstrated that such perceptions can have important effects on behavior. Survey data has demonstrated that a significant proportion of adults perceive negative age-related beliefs in the work context. For instance, one survey in the United Kingdom revealed that nearly a quarter (24%) of working adults agreed that employers are not interested in employing or promoting people over the age of 40

(Chartered Institute of Personnel and Development [CIPD], 2001). Two thirds of respondents of a representative sample across the European Union reported that being above age 50 is a disadvantage in the labor market and would reduce the chances of getting a job, accessing training opportunities and being promoted (Marsh & Sahin-Dikmen, 2002). Such figures suggest that many adults have well-defined ideas about how (negatively) older workers are perceived. So far, however, little is known about the effect such meta-stereotypes have on either adult development or organizationally-relevant outcomes (what little is known will be discussed in the Chapter 2).

Aims of the Dissertation

In sum, it has been demonstrated that images of aging can, at least under certain circumstances, affect adults' acute functionality as well as development over the long run. Still, two important gaps in the literature can be identified. First, theoretical models that link images of aging with acute functionality and long-term development are currently insufficient. Secondly, there is a lack of empirical work linking images of aging in the work context with either developmental or organizational outcomes. In particular, there is a need for further investigation of adults' older worker meta-stereotypes.

With my dissertation work, I aim to help close these two gaps in the images of aging literature. Specifically, I aim to contribute to a richer theoretical discussion of how images of aging affect acute functionality as well as long-term development. Furthermore, I aim to provide empirical evidence of the relationship between images of aging in the work context and adult development as well as organizational outcomes. In particular, I will focus on adults' older worker meta-stereotypes specific to their current work context.

In addition to these more specific aims, the broader objective of the dissertation is to demonstrate that images of aging are related to the plasticity of adult development. Human development is the result of variable and interacting systems of influence (biological, environmental, psychological). That said, any observable developmental trajectory is just one manifestation of a large, though not infinite, range of alternative possibilities. Plasticity

refers to the range and limits of development and is an index of an individual's change potential (Baltes, 1987; Lerner, 1984). Another way to think of plasticity is the difference between an individual's realized and maximum (or minimum) potential (Staudinger & Lindenberger, 2003). I aim to demonstrate that images of aging constitute contexts (circumstance, environment) of aging that affect the range and limits of adult development. This broader aim of the dissertation is in line with one of the objectives of lifespan developmental research to search for the conditions under which especially the upper limits of plasticity are reached (e.g., Greve & Staudinger, 2006; Kessler & Staudinger, 2006; Staudinger, Marsiske, & Baltes, 1995).

To achieve these aims, I have drawn on the social psychological and lifespan psychological literatures and conducted an extensive literature review as well as conducted empirical analyses of questionnaire data from a sample of working adults ($N = 337$). The current work presents the results of these analyses.

Set Up of the Dissertation

In Chapter 2, I define and review the research on the three different kinds of psychological images of aging that are the focus of the current dissertation work: *age stereotypes* (i.e., what people associate with older people), *age meta-stereotypes* (i.e., what people think other people associate with older people), and *aging self-perceptions* (i.e., how people perceive their own aging). I also discuss previous research on age stereotypes and age meta-stereotypes in the work context.

In Chapter 3, I review previous theoretical and empirical work on how images of aging translate into individual outcomes, concluding with a brief discussion of the shortcomings of current theoretical discourse in this area. In Chapters 4 through 6, I draw on aspects of the lifespan psychology framework of development to construct a meta-theoretical model of how images of aging affect acute functionality and developmental trajectories. In Chapter 4, I describe the aspects of the lifespan framework of development important for the current discussion and argue that images of aging constitute part of as well

as affect an individual's *reserve capacity*—that is, the sum total of “resources” available to the individual at any given time (Greve & Staudinger, 2006; Staudinger et al., 1995). Chapter 5 builds on the concept of *baseline reserve capacity* (i.e., the resources an individual has for immediate performance) to explain how images of aging affect acute functionality. Specifically, in this chapter I analyze experimental research on how contextual reminders of age stereotypes affect baseline reserve capacity and acute functionality. I argue that the effect of age stereotype reminders is dependent on a number of personal factors, many of which normatively change over the life span. In Chapter 6, I expand upon the concept of *developmental reserve capacity* (i.e., the resources an individual has to invest in his or her development). I describe how images of aging are linked with a number of other developmental resources to illustrate how images of aging affect development over the long-term via the psychological, physiological, behavioral as well as external contextual pathways.

Chapters 7 through 10 describe a series of empirical investigations on images of aging in the work context. In Chapter 7, I describe the sample and data collection procedure for the empirical studies. In Chapter 8, I analyze the statistical properties of a measure of older worker meta-stereotypes specific to the work context. In the two following chapters, I empirically investigate how images of aging in the work context, including older worker meta-stereotypes but also individuals' and their supervisors' aging self-perceptions, relate to (a) working adults' promotion focus, that is, their self-regulatory orientation concerned with the attainment of ideals, hopes and aspirations and the achievement of new gains (Higgins, 1997, 1998) (Chapter 9) and (b) working adults' intentions to leave (or stay in) their current work context (i.e., their turnover intentions) (Chapter 10).

Finally, in Chapter 11, I conclude with a review of the individual chapters and discuss how the dissertation as a whole demonstrates that images of aging are related to the plasticity of adult development. I discuss whether images of aging can be changed. Finally, I briefly outline the contributions of the dissertation and make suggestions for future research.

Chapter 2

Age Stereotypes, Age Meta-Stereotypes and Aging Self-Perceptions

The term 'images of aging' is an umbrella term for associations with old age and/or the aging process, which does not specify either a target (e.g., older people in general or the self) or a perceiver (e.g., self or others). My dissertation work focuses on three specific types of psychological images of aging: age stereotypes, age meta-stereotypes, and self-perceptions of aging.

Age Stereotypes

Stereotypes are mental representations of a social group (Kunda, 1999). Stereotypes encompass information about the traits and behaviors expected from members of a particular social group, as well as feelings (attitudes) towards that group (Fazio, Jackson, Dunton, & Williams, 1995). Stereotypes also contain knowledge about variability, or in other words, the likelihood that a member of a certain social group possesses a particular trait (for a review, see Hamilton & Sherman, 1994). Sex, age and race are among the first characteristics we notice when we meet new people (Fiske, 1998; Kite, Deaux, & Miele, 1991), thus, stereotypes based on these categories are particularly well defined.

Age stereotypes refer to an individual's associations with a *generalized* older person¹. While stereotypes are first and foremost an *individual's* associations with a social group, stereotypes are often shared among groups of people. Researchers have studied these shared aspects of stereotypes of older adults since the 1950s. Researchers generally agree that stereotypes of old age are rather negative, at least in Western countries (Butler, 1980; Kite & Johnson, 1988; Kite, Stockdale, Whitley, & Johnson, 2005). A recent meta-analysis of 232 effect sizes demonstrated that older adults are perceived as less competent,

¹ The term 'age stereotype' could be used to describe stereotypes about any age group (e.g., children, middle-aged). Unless otherwise specified, I use the term 'age stereotype' to refer to mental associations with exclusively older people.

evaluated less favorably and treated more negatively than younger adults, even when individuating information is available (Kite et al., 2005). Furthermore, the predominance of negative stereotypes seems to increase with the target's age. Studies have shown that older adults tend to be evaluated more negatively than younger targets (Canneto, Kaminski, & Felicio, 1995; Kite et al., 2005). Similarly, targets fitting a positive subtype of older adults were perceived as younger than targets fitting a negative subtype (Hummert, 1990).

While overall the negative stereotypes of old age tend to prevail, research has continuously demonstrated that stereotypes about age and older adults are actually quite complex. In this vein, it has been found that people have both positive and negative associations with old age and aging that vary considerably across domains (Kite & Johnson, 1988, Kite et al., 1991; Kite et al., 2005; Perdue & Gurtman, 1990). Furthermore, stereotypes of elderly adults can be broken down into several clusters or subtypes that vary in positivity and negativity (Brewer, Dull, & Lui, 1981; Hummert, 1990; Schmidt & Boland, 1986). Positive clusters such as the "perfect grandparent" encompass associations of older adults with wisdom, self-acceptance and warmth, while negative clusters such as the "severely impaired" encompass associations with ill health and dependence (Hummert, 1990). Similarly, other studies found that older adults were considered slow, useless, unattractive, incompetent and dependent, but also wise, warm and reliable (Kite & Johnson, 1988; Kite et al., 2005). Minor variations aside, there seems to be general consensus between age groups (e.g., Hummert, Gartska, Shaner, & Strahm, 1994) and across cultures (e.g., Löckenhoff et al., 2009) with regards to the negative and positive characteristics associated with old age.

The fact that people have both negative and positive associations with old age demonstrates that (age) stereotypes are context-dependent. That is, age (as with other social categories) is associated with different traits and attitudes depending on circumstances such as the setting in which the target (e.g., older person) is observed (e.g., nursing home, with a grandchild) as well as the domain of evaluation (e.g., memory,

wisdom). Indeed, the activation of particular stereotypes has been shown to be context-dependent, even on an automatic level (e.g., Casper, Rothermund, & Wentura, in press).

Research has shown that stereotypes about social groups generally consist of two dimensions: warmth and competence (Fiske, Cuddy, Glick, & Xu, 2002). Stereotypes about older adults, similar to stereotypes about retarded and disabled people, generally consist of feelings of warmth (a positive perception) but also evaluations of incompetence (a negative perception) (Abrams, Eilola, & Swift, 2009; Fiske et al., 2002; see also Kite & Johnson, 1988). The age stereotype associated with a particular context may well be associated with the degree to which the context is related to particular skills and goals associated along the warmth and competence dimensions. For instance, age stereotypes in domains where social skills and interpersonal relationships play a larger role (e.g., as a grandparent interacting with a grandchild) may be more positive than most age stereotypes in the work context, in which performance and competence usually play a bigger role. As the work context is one of the major developmental contexts of adulthood, age stereotypes in the work context are particularly relevant for the current consideration of images of aging and adult development.

Age stereotypes in the work context

Parallel to the images of older people in general, stereotypes about older workers have also been documented. When does a worker become 'older'? A recent international survey of 6320 private sector employers in 21 countries indicated that there were considerable differences between countries with regards to the age at which an employee was considered old, ranging from 44 years in Turkey to 60.4 years in Japan (Harper et al., 2006). In Germany, the threshold age was 51.7 years, which may reflect an increase in comparison to earlier research that suggested employees in Germany were already considered 'older' around the mid-forties (Filipp & Mayer, 1999).

Despite being much younger than the elderly targets of other age stereotype studies, older workers are also subject to similar stereotypes. A recent review of the literature identified five major negative stereotypes about older workers: Older workers are thought to

(a) perform poorly, (b) resist change (c) learn less easily (d) have shorter tenure and (e) cost more. The only positive stereotype identified in the review was that older workers are thought to be more dependable (Posthuma & Campion, 2009). These stereotypes seem to be relatively robust across countries. In the international study mentioned in the previous paragraph, employers in 21 countries were asked to compare older and younger workers on a range of stereotypical characteristics (e.g., loyal, flexible, technologically oriented). Across countries, employers did indeed tend to assign individual traits to either older (e.g., reliable, loyal) or younger workers (e.g., flexible, quick learners). Generally, employers did not regard older employees less positively than younger workers, though there was still some between-country variation: Employers' age attitudes were most positive in the United Kingdom and the United States and most negative in Turkey and Saudi Arabia (Harper et al., 2006). Unfortunately, the authors provided no specific information about employers' associations with older workers in Germany. Data from the Institute for Employment Research Establishment Panel (2002) confirms that a considerable proportion of German employers expect more flexibility (19%), learning ability (31%) and creativity (18%) from younger employees and higher working morale (30 %), quality consciousness (26 %), and loyalty (17%) from older employees (Bellmann, 2002). These results show that stereotypes about older workers thrive in Germany as well, particularly as we would expect self-reported stereotype data to underestimate 'true' figures due to social desirability concerns, among other factors.

Findings with regards to age stereotypes correspond with studies on age discrimination, that is, the disparate *treatment* of individuals based on their age. A recent meta-analysis of age discrimination studies in laboratory and field settings confirmed a significant yet modest overall effect size such that younger applicants and workers were evaluated more positively than older applicants and workers (Gordon & Arvey, 2004).

Age Meta-Stereotypes

The term *meta-stereotype* refers to what an individual thinks *other* people believe to be true about his or her social group (Vorauer et al., 1998). For example, an East German may have the meta-stereotype that West Germans think that East Germans are lazy. Age meta-stereotypes refer to what an individual believes *others* associate with a particular age group.

To the best of my knowledge, little research has directly investigated the content of individuals' age meta-stereotypes. One recent German study suggested that most people (52%) think that other people perceive aging negatively (associated with general troubles, aches and pains above all else) as opposed to a phase of life that offers new chances (23%) (25% indicated no opinion; Robert Bosch Stiftung, 2009). Interestingly, in this same study, 63% of journalists reported thinking that most other people perceive aging as associated with general troubles, aches and pains above all else, yet only 29% of the journalists agreed that this statement reflected their own aging stereotypes. The limited research results suggest that people have meta-stereotypes of aging that are distinct from their own (at least explicit) age stereotypes and perceptions about their own aging. Furthermore, the results imply that people assume that other people endorse more negative age stereotypes than they do themselves. This is consistent with findings that people generally tend to assume that other people hold more negative stereotypes than they do to themselves (e.g., Judd, Park, Yzerbyt, Gordijn, & Muller, 2005).

Age meta-stereotypes in the work context

Related to the idea that organizations have their own psychological environments (e.g., Jones & James, 1979; Parker et al., 2003), as well as to the idea that different social contexts seem to be characterized by somewhat different age associations (e.g., Löckenhoff et al., 2009 with regards to cultures; Abrams et al., 2009 with regards to regions) we have developed a measure of older worker meta-stereotypes specific to their current work context (i.e., their organization or working group).

We have developed the Psychological Age Climate Scale (PACS) to measure older worker meta-stereotypes specific to their current work context² (Noack, Bowen, & Staudinger, 2009). The PACS asks employees to rate the extent to which older workers in their company or working group are perceived as each of ten positive attributes (e.g., ‘productive’, ‘cooperative’) based on the age stereotype literature. This scale is thus somewhat similar to the Aging Semantic Differential (Rosencranz & McNevin, 1969), which also asks participants to decide which of two bi-polar adjectives more accurately describes a person of a certain age. By using only positive adjectives, the PACS was designed to minimize social desirability concerns as people are generally more reluctant to assign a negative attribute to a group, though less reluctant to award ‘less’ of a positive attribute. Furthermore, the PACS uses the referent-shift approach (Chan, 1998) by asking respondents not to report their own views, but rather their *meta-stereotype* of older workers within either the company or working group. Therefore, the referent-shift approach justifies aggregating individual employees’ responses to the group-level because individual employees have *answered* with regards to the group-level (i.e., work team or organization). (In order to aggregate individual responses, statistical criteria for aggregation must also be met—an issue that will be discussed at length in Chapter 8.) Because of its closed-ended design and the exclusive use of positive adjectives, scores on the PACS represents a measure of the *positivity* of a meta-stereotype of older workers *specific to a particular work context*, as opposed to a measure of either the *content* or *saliency* of meta-stereotypes of older workers or *general* older worker meta-stereotypes. The scale is available in Appendix A. [To somewhat ease readability, I will refer to the older worker meta-stereotypes as measured by the PACS as *older worker meta-stereotypes_{WC}* as a reminder that I am

² In past work, we have referred to older worker meta-stereotypes specific to their work context as *psychological age climate* (Noack, B. Baltes, & Staudinger, 2010; Noack, Bowen & Staudinger, 2010, 2010). In the dissertation I have chosen to stick to the social psychological terminology of meta-stereotype (Vorauer et al., 1998) instead of the organizational terminology of psychological climate (i.e., employee’s perceptions of his or her social environment; Jones & James, 1979; see also Parker, et al., 2003). Both terms, however, refer to the same construct and operationalization.

referring to older worker meta-stereotypes specific to a particular work context (WC) as opposed to general older worker meta-stereotypes.]

As already mentioned in the general introduction, surveys suggest that working adults perceive that negative stereotypes about older workers are widespread (e.g., CIPD, 2001; Marsh & Sahin-Dikmen, 2002). However, little is known about what effect such meta-stereotypes have on adults, either with regards to their functionality, development or work-related attitudes or behaviors. Previous work has shown that older workers' (>40 years) older worker meta-stereotypes_{WC} were associated with their affective commitment to the organization as well as their self-reported work ability (Noack, B. Baltes, & Staudinger, 2010; Noack, Bowen, & Staudinger, 2010). Older employees who reported more positive older worker meta-stereotypes_{WC} were more committed to their organization and reported higher work ability. These results are in line with the limited evidence on the effects of perceptions of age discrimination, that is, perceptions of biased *behavior* (as opposed to cognitive representations) based on age. Hassell and Perrewé (1993) found that employee's perceptions of age discrimination (for being either "too young" or "too old") were associated with less perceived control. Furthermore, older workers' perceptions of age discrimination were associated with lower self-esteem. Orpen (1995) found that perceived age discrimination correlated negatively with job satisfaction, organizational commitment and job involvement.

Initial research suggests that there is significant within-company agreement with regards to older worker meta-stereotypes_{WC}. That is, there is enough agreement among members of an organization to be able to speak of an *organizational age climate* as the shared perceptions among members of an organization with regards to how positively older workers are viewed within that organization (Noack, 2009; Noack & Staudinger, 2010; see also Schneider, 1975). Indeed, ongoing research has suggested that companies are characterized by different organizational age climates (Noack & Staudinger, 2010). Case study analysis has suggested that organizational age climate is associated with organizational age management strategies such as knowledge management, health and

retirement practices as well as further training policies and practices (Noack & Staudinger, 2010). According to this initial study on the organizational image of older workers, company-membership accounted for approximately 10% of the overall variance on the PACS. This implies that while companies do significantly contribute to employees' older worker meta-stereotypes_{WC}, older worker meta-stereotypes_{WC} predominantly represents an individual-level variable.

Self-Perceptions of Aging

Finally, as a third distinct psychological image of aging, individuals also have perceptions about their *own* aging. Aging self-perceptions refer to how individuals perceive their own aging process, including already lived experiences as well as generalized expectations with regards to aging in the future (Steverink, Westerhof, Bode, & Dittmann-Kohli, 2001). Self-perceptions of aging have been studied with regards to individuals' global (Lawton, 1975; Schelling & Martin, 2008) as well as facet-specific (e.g., Steverink et al., 2001) subjective evaluations of their aging experience. An example of a global evaluation is *aging satisfaction* (e.g., Lawton, 1975), which refers to an individual's explicit evaluation of their overall satisfaction with the perceived changes that have occurred with aging. Other research has separately measured perceptions of the positive and negative aspects of aging as independent dimensions. Indeed, across age groups, people perceive aging as consisting of gains *as well as* losses (e.g., Heckhausen, Dixon, & Baltes, 1989). Previous research involving a large sample of middle-aged and older Germans ($N = 4034$, aged 40 to 85 years) identified three dimensions of the subjective experiences of aging: (a) perceptions of physical decline, (b) perceptions of continuous growth, and (c) perceptions of social loss (Steverink et al., 2001). These dimensions can also be consolidated as perceptions of the positive aspects (gains) and negative aspects (losses), depending on the research question and the theoretical model (cf. Steverink et al., 2001).

Individuals tend to perceive both negative and positive aspects of their own aging, and often the losses associated with aging tend to dominate. For instance, adult participants

expected to grow in wisdom in later adulthood but also expected to decline on most other desirable characteristics in the same age period (Heckhausen & Krueger, 1993). Generally, studies indicate that older people have more positive and more complex images of aging than younger people (Heckhausen et al., 1989; Hess, 2006; Wentura & Rothermund, 2005). Older people also tend to perceive their own aging more positively than others' aging (Hess, 2006; Wentura & Rothermund, 2005). It has been suggested that the increasing positivity of people's age stereotypes is the result of increasing *experience* with age, as the experience of aging tends to be more positive (or at least less negative) than common old age stereotypes would suggest (Wentura & Rothermund, 2005). Initial research suggests that it is increasing experience with age that leads to more positive age stereotypes at higher ages as opposed to in-group favoritism or distancing oneself from the negatively stereotyped group (Hummert et al., 1994). In this study, the age stereotypes of middle-aged adults were more positive than the age stereotypes of younger adults, but less positive than the age stereotypes of older adults. The authors argued that there should be no differences between the age stereotypes of younger and middle-aged adults if age stereotypes were the result of in-group favoritism (Hummert et al., 1994). Still, we note that these conclusions were based on group comparisons and without a measure of 'experience' with age, and we suspect that there is a great deal of individual variation. In this vein, increasing age is thought to lead to more positive age stereotypes particularly for people who are able to let go of youthful ideals and flexibly adapt goals to the circumstances of older ages (e.g., Brandtstädter & Greve, 1994; Wentura & Brandtstädter, 2003; Wentura & Rothermund, 2005).

In this chapter, I have defined and reviewed research on three specific types of psychological images of aging: age stereotypes, age meta-stereotypes, and aging self-perceptions, as well as discussed age stereotypes and age meta-stereotypes in the work context. In the following chapters, I theoretically and empirically explore how these three kinds of images of aging affect adult development. Age stereotypes and age meta-stereotypes in the work context are the subject of the empirical investigations covered in Chapters 7 through 10.

Chapter 3

How do Images of Aging Affect Adults? Previous Research on General Processes

If they are not already, images of aging eventually become self-relevant for everyone who lives long enough. Therefore, images of aging have a developmental regulatory function because they to some extent characterize the possibilities for one's own development (Brandtstädter & Greve, 1994; Brandtstädter, Wentura, & Rothermund, 1999; Rothermund & Brandtstädter, 2003; Wentura & Rothermund, 2005). Images of aging appear to exert their influence along at least three tracks: psychological, behavioral and physiological as sources of stress (Levy, 2009).

Four general processes have been proposed for describing how images of aging actually translate into acute functionality and developmental trajectories: internalization, externalization, contamination and comparison processes (Rothermund, 2005; Wentura & Rothermund, 2005). Stereotype internalization is usually defined as the incorporation of negative societal views into the self-concept: People first become aware of societal age stereotypes; tend to endorse these stereotypes (i.e., they believe the stereotype is true about older people and aging); finally they come to believe that the stereotype is true about themselves (e.g., Levy, 2009; McKown, & Weinstein, 2003). I will distinguish between the social learning process whereby individuals learn the age stereotypes shared by members of their social context (e.g., culture, family) and available in their environment (e.g., through media images) as *internalization*, and the process by which general age stereotypes infuse self-views as *contamination* (Rothermund, 2005; Rothermund & Brandtstädter, 2003; Wentura & Rothermund, 2005). *Contamination* refers to the process by which individual's old-age stereotypes in turn become integrated in his or her self-perceptions of aging and self-concept. *Externalization* refers to the process by which an individual's (aging) self-concept contributes to his or her general age stereotypes (Rothermund & Brandtstädter, 2003; see also Clement & Krueger, 2002). *Comparison* processes (e.g., Heckhausen &

Krueger, 1993; Heidrich & Ryff, 1993; Rickabaugh & Tomlinson-Keasey, 1997; Robinson-Whelen & Kiecolt-Glaser, 1997) refer to the use of (negative) images of aging as the basis for (self-enhancing downward) comparisons. After reviewing the literature on these processes, I briefly discuss the short-comings of the literature for providing a complete model for how images of aging affect adult development.

Internalization

As previously mentioned, internalization refers to the socio-cultural learning process by which people learn cultural stereotypes, and hence, cultural stereotypes become integrated into an individual's own age stereotypes (e.g., Levy 2009). The internalization process varies across people according to characteristics of the social context (including culture) as well as personal characteristics. On the contextual-side of the equation, social environments seem to be characterized by different associations (of varying strength) with old age. For instance, younger people's age associations—particularly with regard to older people's socio-emotional characteristics and social status—have been found to differ somewhat across countries (Löckenhoff et al., 2009). Caregivers in assisted living facilities for older people are thought to have more negative age stereotypes because of their disproportional exposure to age-related losses (Neikrug, 2003). Furthermore, greater lifetime television viewing has been associated with more negative stereotypes, perhaps because the media portrayal of older people has tended to be rather negative³ (Donlon, Ashman, & Levy, 2005). The age associations that characterize a certain environment are communicated through, for example, age-related social roles (e.g., as productive employees, as purveyors of wisdom, participants in education), policies (e.g., regarding further education, retirement benefits), the attitudes of socialization agents (e.g., parents, supervisors), common jokes, as well as media images (Filipp & Mayer, 1999).

³ However, it should be noted that recent studies have found that images of aging on certain types of media tend to be *more* positive in comparison with younger characters and reality (e.g., Kessler, Rakoczy, & Staudinger, 2004 with regard to German TV prime time soap operas; Kessler, Schwender & Bowen, 2010, with regards to German primetime television commercials).

Individual characteristics can render some individuals more susceptible to internalization processes. Children, adolescents and young adults are particularly susceptible to internalization processes because old age stereotypes are not yet self-relevant and are therefore not critically considered (Levy, 2009). Even school-aged children categorize people by age and attach value to different age categorizations (see Filipp & Mayer, 1999 for a review). Children's limited cognitive and/or psychosocial abilities no doubt influence their susceptibility to internalize the images of aging in the environment. Furthermore, younger people typically have little exposure to older adults, especially outside the family (Hagestad & Uhlenberg, 2005). In line with the trend that intergroup contact typically reduces prejudice (Pettigrew & Tropp, 2006), younger adults' limited personal experience with older adults likely makes it easier to both categorize older adults as a homogenous group as well as attribute negative characteristics to older age groups. Adolescents, young adults, and middle-aged adults may be motivated to endorse negative old age stereotypes in order to justify certain beliefs, behaviors and practices from which younger people can profit (Levy, 2009). For instance, endorsing negative old age stereotypes helps to justify the practice of laying off older workers to 'make room' for younger employees. Finally, individual traits such as rigidity (Levy, 2008; Neuberg & Newsom, 1993) or authoritarian personality (Adorno, Frenckel-Brunswick, Levinson, & Sanford, 1950) can predispose individuals to adopting and endorsing more fixed (age) stereotypes.

Research and theory has tended to focus more on internalization processes, that is, the process by which people absorb contextually-available images of aging. However, people also contribute to the construction of their social context. For instance, for better or worse, individuals can act as role models. Therefore, when individuals (older individuals in particular) implicitly or explicitly communicate their own aging self-perceptions, they may contribute to how age is socially constructed within a particular environment. To date, this idea has received little attention within the images of aging literature.

Externalization

Externalization refers to the process by which people's aging self-perceptions and self-views infuse their age stereotypes (Rothermund & Brandtstädter, 2003; see also Clement & Krueger, 2002). When people predict the characteristics of others, they tend to assume that other people are similar to themselves (i.e., *projection*, see Krueger, 2000 for a review). Experience with age may affect one's perceptions of the typical older person and the aging process in general (e.g., Hummert et al., 1994; Rothermund & Brandtstädter, 2003; Wentura & Rothermund, 2005). Evidence of externalization is found in the positive correlation between perceived personal problems and the problems of older people in general (Heckhausen & Brim, 1997). Perceiving one's own (aging-related) problems as typical may help to relieve the distress associated with age-related losses and problems.

Internalization and externalization describe the processes by which individuals form their age stereotypes and aging self-perceptions. The contamination and comparison processes, described in the following section, concern the effects that these learned stereotypes can have on adults' self-perceptions.

Contamination and Comparison Processes

Contamination and comparison processes predict essentially opposite effects of age stereotypes. Contamination theories predict that negative age stereotypes become incorporated into older adults' self-views and hence result in assimilation effects. In contrast, comparison theories predict that adults' self-views remain resilient, and thus negative age stereotypes can be used for self-enhancing comparisons which can result in contrast effects (Rothermund & Brandtstädter, 2003). In the past, the contamination and comparison hypothesis have been 'pitted against' one another. That is, authors have tested one hypothesis against the other (e.g., Pinguart, 2002), instead of looking for the particular conditions that make contamination (assimilation) or comparison (contrast) more likely. As an exception, Rothermund (2005) provides a thoughtful consideration of possible

moderators which determine whether reminders of an age stereotype will result in assimilation or contrast effects.

Typically, comparison processes refer specifically to the use of *negative* images of aging as the basis for self-enhancing comparisons (contrasts), although positive images of aging might also be used as the basis for comparisons as a sort of positive *possible self* (Cross & Markus, 1991; Markus & Nurius, 1987) to towards which one can strive. Furthermore, while the comparison hypothesis in the context of age stereotypes has typically been used to explain contrast effects, comparison standards can lead to *both* assimilation or contrast, depending on whether the individual uses the comparison standard for similarity testing ('How am I the same as the stereotype?') or difference testing ('How am I different from the stereotype?') (Mussweiler, 2003; Rothermund, 2005).

Longitudinal evidence suggests that with increasing age, as individuals begin to self-define as older or old, adults' general age stereotypes tend to contaminate their perceptions about their own aging. A cross-sequential study of older adults (initially aged 55 to 77 years; $N = 690$) found that stereotyped expectations of elderly people predicted self-appraisals eight years later (Rothermund & Brandtstädter, 2003). A five-year longitudinal study (initially aged 54 to 77, $N = 896$) showed that across time, people tended to internalize their stereotypes about older people into their self-perceptions of aging (Rothermund, 2005). Similarly, endorsement of stereotypical statements regarding retirement at baseline predicted subsequent aging self-perceptions evaluated at five time-points over a twenty year time period (Levy, 2008).

This is not to say that individuals do not, in some instances, also use (negative) age stereotypes as the basis for self-enhancing downward social comparisons. Several studies have demonstrated that comparing oneself with a generalized or typical old person can lead to more positive self-evaluations (e.g., Heidrich & Ryff, 1993; Kwan, Love, Ryff, & Essex, 2003; Pinquart, 2002; Rickabaugh & Tomlinson-Keasey, 1997; Robinson-Whelen & Kiecolt-Glaser, 1997; Ryff & Essex, 1992). Still, it seems that the self-enhancing effect of negative age stereotypes is limited to the short-term, whereas contamination effects seem to 'win-out'

over the long-term (Rothermund, 2005; Wentura & Rothermund, 2005). In addition, older adults do not seem to normally use their stereotypes about “typical old people” as sources for self-enhancing downward social comparisons (Rothermund, 2005). Results indicate that elderly people only rarely compare themselves with global views of old people when not explicitly instructed to do so (Rickabaugh & Tomlinson-Keasey, 1997).

The internalization, externalization, contamination and comparison processes provide some general clues about how images of aging can translate into short-term and long-term outcomes. Still, these theoretical models fall short of providing a meta-theory which integrates all of the different ways how images of aging affect adult development. For instance, while it has been widely acknowledged that internalization and contamination do take place, this area of the literature has stopped short of explaining how aging self-perceptions (once internalized) in turn translate into the many different acute as well as long-term psychological and physiological outcomes that have been associated with images of aging (e.g., health, cognitive performance). It has also been shown that individuals' do not necessarily have to endorse a stereotype themselves in order to be affected by it (cf. Steele & Anderson, 1995). Just perceiving the ‘threat in the air’ that *other* people might judge the self as behaving in line with a negative stereotype can cause detrimental performance (*‘stereotype threat’*, to be discussed in Chapter 5). Research in other fields has shown that *other* people's stereotypic expectations can also affect individuals' behavior and performance over the longer term (e.g., teachers and stigmatized minority student performance, Jussim & Harber, 2005). In other words, even an age stereotype that has not been internalized by the person him or herself can acutely and chronically affect an individual. Furthermore, with the exception of Rothermund (2005), few researchers have differentiated between acute and long-term developmental effects of images of aging. For instance, (downward) comparison describes one process that seems to explain some *acute* effects of negative age stereotype information, but falls short of explaining the impact of images of aging over the long-term and on outcomes other than self-evaluations (e.g., objective health measures, work participation).

In the next chapter, I consider images of aging within the lifespan framework of development in order to provide a meta-theoretical model of how images of aging affect acute functionality as well as development over the long-term.

Chapter 4

Incorporating Images of Aging into the Lifespan Psychology Framework of Development

As reviewed and discussed in Chapter 2, previous theoretical work has yet to provide an overarching theoretical framework for how images of aging translate into the acute and long-term developmental effects observed within the literature (see Chapter 1). In the current chapter, I integrate images of aging with particular aspects of the lifespan framework of development in order to introduce a meta-theoretical framework that more completely explains how images of aging translate into acute and long-term effects. Specifically, I use the lifespan concepts of *plasticity* and *reserve capacity* to construct the foundations of a meta-theoretical framework of the effects of images of aging.

The Lifespan Psychology Framework of Development

According to the lifespan psychology framework of development, human development is always the result of a complex interaction between biology, culture and the individual him- or herself (e.g., Baltes, Lindenberger, & Staudinger, 2006; Baltes, Reese, & Lipsitt, 1980; Lerner, 1984). Biology refers to physiological, anatomical and genetic resources of the human species as they have evolved across the life span as well as across generations (Kirkwood, 2003). Culture refers to “the entirety of psychological, social, material, and symbolic (knowledge-based) resources, which have been developed by humans since their existence” (Baltes et al., 2006, p. 576). Examples of cultural resources include cognitive skills, motivational dispositions, social roles, medical knowledge, technology, schools, and policies. Images of aging can also be considered a cultural resource within this framework. Finally, as a third source of development, the individual actively contributes to his or her own development through his or her choices, actions and reactions (e.g., Brandtstädter, 1999, 2006; Brandtstädter & Rothermund, 2002, 2003; Greve & Staudinger, 2006; Staudinger, 1999). Development can be considered the outcome of a

constant and ongoing process of 'transactional adaptation' (e.g., Lerner, 1984) between the three sources of development (biology, culture and the individual him-or herself) as the individual reacts to his or her (changing) biology and culture.

Contexts of development

Human development is embedded in historical, cultural, social, biological, and psychological contexts. Developmental contextualism (e.g., Baltes et al., 1980) emphasizes that development always has to be considered relative to these contexts. Importantly, context should not be viewed as monolithic but rather as a complex system of interrelated circumstances (Bronfenbrenner, 1979; Greve & Staudinger, 2006). Bronfenbrenner (1979) described four levels ("systems") of contexts: (1) the micro-system, which is composed of immediate settings (including the person); (2) the meso-system, which contains the transactional relationship between two or more immediate settings containing the developing person at a particular point in life; (3) the exo-system, which does not contain the developing person but impinges upon or encompasses the immediate settings in which the person is found and thereby influences what goes on there; and (4) the macro-system that comprises historical events (wars, famines, etc) as well as cultural values and beliefs that may affect the other ecological systems.

Images of aging constitute contexts of development at various levels of abstraction. According to Bronfenbrenner's (1979) classification scheme, an individual's aging self-perceptions, age stereotypes and age meta-stereotypes are part of their micro-context. The interaction between an individual's aging self-perceptions and his or her older worker meta-stereotypes is an example of a meso-context of development. For instance, the interaction between how individuals perceive their own aging and what they perceive to be the images of aging within a given (work) context may affect their decisions to stay in that work context. This idea will be explored in Chapter 10. The interaction between an individual's aging self-perceptions and his or her motivational orientation is another example of a meso-context of development, an idea explored in Chapter 9. The images of aging of the people with whom

we interact can be considered an exo-system of development to the extent that how another person feels and thinks about aging can affect the our own immediate settings —especially when that person is the gatekeeper of developmental resources, such as a work supervisor. This idea will be discussed at some length in Chapter 10. Finally, culturally prevalent age stereotypes or the age stereotypes within a particular work context reflect a macro-context of development by affecting the contexts at all other levels, including the micro-contexts of development (e.g., an individual's age stereotypes and aging self-perceptions through internalization and contamination, see Chapter 3) and the exo-system (other people's images of aging). According to the developmental contextualist perspective, current trajectories of aging need to be considered relative to the images of aging (as micro-, meso-, exo- and macro-contexts) that guide adult development in particular directions.

Plasticity

One of the most important tenets of lifespan psychology is the notion that development is characterized by a considerable degree of *plasticity* (Baltes, 1987; Lerner, 1984). That is, development is neither completely fixed (pre-determined), nor is it completely open. Plasticity refers to the range (and limits) of development and is an index of an individual's change *potential*, including how flexible and robust he or she might be in dealing with challenges and demands (resilience). Note that plasticity is not synonymous with development (i.e., change over time), but rather refers to a kind of meta-development, that is, the degree to which individuals diverge from usually observed developmental trajectories or their own usual level of performance. One of the main objectives of lifespan developmental research has been and continues to be the search for the conditions under which especially the upper limits of plasticity are reached (e.g., Greve & Staudinger, 2006; Kessler & Staudinger, 2006; Staudinger et al., 1995).

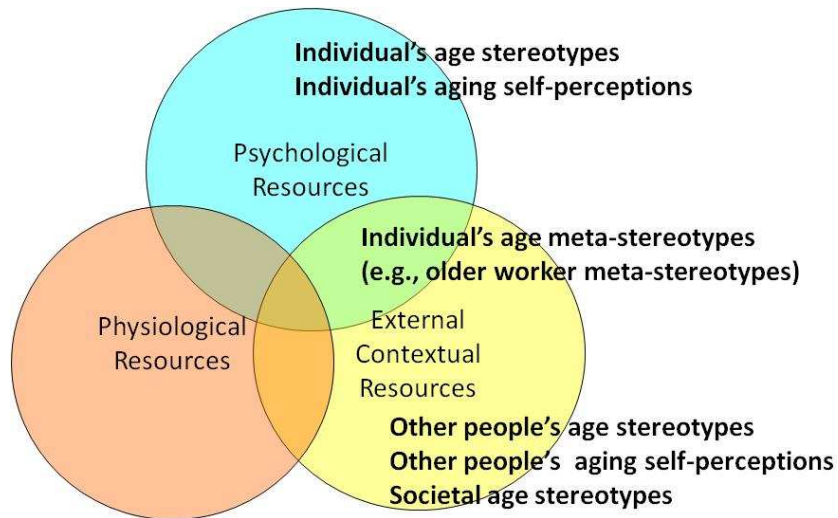
The broader aim of the dissertation is to demonstrate that images of aging, as developmental contexts, contribute to the plasticity of adult development. In other words, images of aging affect the range—and limits—of an individual's developmental potential.

Reserve capacity

The degree of plasticity is contingent on an individual's *reserve capacity*, that is, the sum total of the “resources” available to the individual at any given time (e.g., Staudinger et al., 1995). In line with other authors, I refer to a broad definition of resources as “those objects, personal characteristics, conditions, or energies that are valued in their own right or that are valued because they act as conduits to the achievement or protection of valued resources” (Hobfoll, 2001, p. 339). Resources can be roughly categorized as physiological resources, external contextual resources and psychological resources, though the borders between the three categories of resources can only be loosely defined, since resources of any kind overlap categories as well as affect other resources. In other words, resources are ‘bundled’ (Hobfoll, 2002) or mutually dependent (Baltes et al., 2006), and can only be considered in relation to each other (Baltes et al., 2006; Greve & Staudinger, 2006; Lerner, 1984). For instance, consider the resource of a sense of personal control. Primarily, internal control beliefs are a psychological resource, but clearly internal control beliefs are also inextricably intertwined with particular physiological resources (e.g., features of the approach and avoidance systems) as well as contextual resources (e.g., cultural norms, family values, necessity for and opportunity to exercise personal control in the environment). Furthermore, internal control beliefs are themselves a resource, but also influence other resources. For instance, people with higher levels of internal control may also be more likely to purposefully try to control their health through diet and exercise (Lachman & Prenda Firth, 2004), and may therefore also have higher physiological resources.

Images of aging also fit into the resource framework. Specifically, at any single point in time, an individual's age stereotypes and aging self-perceptions constitute part of his or her psychological resources. Other people's (e.g., a work supervisor) age stereotypes and self-perceptions of aging, as well as age stereotypes as they exist in society, constitute external contextual resources. An individual's age meta-stereotypes, including his or her older worker meta-stereotypes, constitute resources located at the overlap between psychological and external contextual resources (see Figure 1).

Figure 1. Images of aging as components of an individual's reserve capacity.



Lifespan researchers have distinguished between two-tiers of reserve capacity (Staudinger et al., 1995). *Baseline reserve capacity* denotes an individual's maximum performance potential at any given moment. *Developmental reserve capacity* denotes an individual's *future* change potential. Over time, an individual's adaptive capacity can change due to, for instance, biological maturation/senescence, behavioral modifications, psychological changes, or changing environmental contexts more or less conducive to positive development. Thus, developmental reserve capacity can increase, stay level or decrease across ontogenesis.

Images of aging serve as resources in their own right and affect the availability of other resources in the short-term, as well as the accumulation (or disintegration) of resources over the long-term. Thus, images of aging can be considered components—as well as determinants—of individuals' baseline as well as developmental reserve capacity, respectively. The notion of images of aging as components and determinants of individuals' baseline and developmental reserve capacity will be elaborated in Chapters 5 and 6.

Chapter 5

Images of Aging as Components and Determinants of Individuals' Baseline Reserve Capacity: Placing Age Stereotype Activation Research into a Lifespan Developmental Context^{4,5}

Empirical studies have demonstrated that images of aging (specifically, age stereotypes) affect individuals' acute⁶ functionality and performance potential across a number of domains (e.g., cognitive, attitudinal, physiological). Generally, reminders of age stereotypes tend to result in behavior consistent with the age stereotype. As previously mentioned, subliminal priming of positive or negative age stereotypes with older adults has resulted in better/worse memory performance (Levy, 1996; Stein et al., 2002), variations in the shakiness and clarity of handwriting (Levy, 2000), variations in walking speed and balance (Hausdorff et al., 1999), variations in cardiovascular responses to stress (Levy et al., 2000; Levy et al., 2008) and even variations in the will to live (Levy, Ashman, & Dror, 1999-2000). Several researchers have also demonstrated that using situational cues to activate an age stereotype can affect older adults' memory performance (Chasteen et al., 2005; Hess et al., 2003; Hess et al., 2004; Rahhal et al., 2001) and general cognitive performance (Abrams et al., 2006).

The relationship between contextual reminders of age stereotypes and measures of adults' acute functionality are demonstrative of how images of aging constitute—as well as influence—an individual's baseline reserve capacity, and hence, their maximum performance potential. In this chapter, I analyze empirical studies of the acute effects of age stereotype activation and integrate these studies into the lifespan developmental framework. Specifically, I analyze the baseline reserve resources with which age stereotypes are

⁴ This chapter is a pre-print of an article submitted to a journal of the American Psychological Association for publication.

⁵ This chapter as well as Chapters 9 and 10 represent work by both myself and my advisor, Ursula Staudinger. Hence, I use the pronoun 'we' when referring to the authors.

⁶ This chapter focuses on *acute* functionality as opposed to long-term developmental outcomes.

'bundled' and the processes by which reminders of an age stereotype translate into the acute effects observed in many experimental settings.

Inconsistent Results of Age Stereotype Activation Experiments

What happens when a cue in the environment reminds someone of old age? Generally, the situational activation of explicit and implicit age stereotypes tends to result in acute effects consistent with the activated stereotype (*assimilation effect*) (e.g., Horton, Baker, Pearce, & Deakin, 2008 for a review on age stereotypes and memory performance). However, age stereotype studies have often yielded inconsistent results, sometimes resulting in contrast effects (e.g., O'Brien & Hummert, 2006) or null results (e.g., Chasteen et al., 2005). For instance, manipulating task instructions to emphasize (or de-emphasize) the memory component of a task affected older adults' performance in some studies (Desrichard & Kopetz, 2005; Rahhal et al., 2001), but had no effect in another (Chasteen et al., 2005). Reading bogus newspaper articles expressing either positive or negative views on aging and memory led to significant differences in the size of the age gap in one study (Hess et al., 2003), but a similar procedure led to only a small difference between experimental conditions within age groups in another (Hess & Hinson, 2006). Late middle-aged adults actually performed *better* when told that their results would be compared with a younger ('threatening' condition) than with an older (non-threatening condition) comparison group (O'Brien & Hummert, 2006). Describing a memory task as age-sensitive (such that performance decreases with age) or as age-neutral (such that performance does not decrease with age) led to performance difference between conditions, but only among more highly educated adults (Andreoletti & Lachman, 2004). Implicit priming experiments, in which participants are primed with age-related stereotypes outside of conscious awareness, have generally resulted in congruent performance patterns (e.g., Levy, 1996), but also in inconsistent effect sizes (Hess, 2005). Furthermore, experimental results have not always proven replicable. For instance, despite following a similar procedure, Stein and colleagues (2002) did not find evidence that subliminal presentations of words related to a positive age

stereotype improved older adults' memory performance, thus failing to replicate Levy's (1996) findings.

We propose that the inconsistent results of old age stereotype activation experiments have at least partly arisen due to the use of social psychological experimental paradigms that have primarily focused on differences between conditions (e.g., stereotype main effects) as opposed to person by context interactions in addition to isolated considerations of the pathways by which age stereotypes can affect behavior as well as individual moderating factors (i.e., only one pathway/moderator is tested at a time). We argue that in order to make better predictions about who, under which circumstances, and how adults react to an age stereotype, it is necessary to integrate the social psychology approach to the study of stereotypes with the lifespan approach to individual development, whereby the individual transacts with his or her environment (e.g., reminders of an age stereotype) based on his or her own characteristics and resources. We feel that combining these two approaches can lead to better predictions about the particular contexts (internal and external) that determine when and how older adults acutely (as opposed to over the long-term) react to contextual reminders of an age stereotype.

In order to make first strides of combining the social psychological and lifespan approaches, we present an integrated conceptual model of the mechanisms by which old age stereotype activation can affect behavior, as well as examples of psychological and physiological personal characteristics which potentially moderate how individuals react to age stereotype activation. Furthermore, we aim to place the stereotype activation mechanisms and moderators in the developmental context of older adulthood. To date, many studies of old-age stereotype activation have ignored the many ways in which older adults may differ from younger adults, as exemplified by a relatively wide definition of "older adult" that groups both young-old and old-old adults together (e.g., samples of older adults from 61 –87; Chasteen et al., 2005), which may have also contributed to insignificant differences between experimental conditions (e.g., Chasteen et al., 2005). We therefore discuss the age-gradedness of these potential moderators and mediating processes.

Mechanisms by Which Stereotype Activation Affects Behavior

Stereotype threat, self-stereotyping and ideomotor effects

Stereotype threat is thought to be one process by which environmental triggers of old-age stereotypes affect performance (Steele & Aronson, 1995). Stereotype threat refers to the added pressure that members of negatively-stereotyped groups experience when faced with a (performance) situation in which they could potentially confirm the stereotype. This added pressure is thought to debilitate performance primarily through “hot” factors such as increased anxiety or fear.

Other authors have argued that cues of age stereotypes affect performance through “cold” automatic mechanisms. Models of automatic processes of stereotype activation are built on the notion that there is a direct link between thoughts or mental images that bring about automatic behavioral reactions. The mechanistic link between mental concepts and action relies on a description of the semantic system as organized in a map-like network of nodes, representing concepts (e.g., Neely & Keefe, 1989). *Priming* occurs when activating one concept (or node) results in the spreading activation of related concepts (connected nodes). Once a concept or node has been activated, there is a tendency to act in accordance with the activated concept. Activated concepts can also stimulate physiological arousal.

Reminders of a stereotype activate (‘prime’) certain characteristics associated with the stereotyped group and thus result in behavior consistent with the activated (negative) traits, without conscious awareness. More specifically, *implicit self-stereotyping* refers to the process whereby environmental cues that make age salient results in physiological arousal and behavior in line with the stereotype as the result of spreading activation of the (negative) traits associated with old age (Levy, 2003). Ideomotor processes provide a more specific example of the kind of automatic process whereby stereotype activation can affect behavior (Bargh, 1996; James, 1890). Ideomotor processes refer to the idea that “thinking is doing”; that when a (motor-related) concept has been activated, people tend to act in an assimilative

way. For instance, implicit reminders of the stereotype that older people are slow can automatically elicit slow behavior, even for younger adults for whom the concept of 'old' is not self-relevant (Bargh, Chen, & Burrows, 1996; Dijksterhuis, Aarts, Bargh, & van Knippenberg, 2000; Dijksterhuis, Spears, & Lepinasse, 2001).

An integrated model of stereotype activation

Authors have generally treated *either* stereotype threat or the more automatic mechanisms (i.e., self-stereotyping or ideomotor effects) and have sometimes argued for one mechanism against the other (e.g., O'Brien & Hummert, 2006). However, it seems reasonable to assume that *both* stereotype threat and more automatic processes can (and probably do) occur concurrently (Wheeler & Petty, 2001). Both automatic processes (e.g., priming through spreading activation of associations with old age) and more controlled processes (e.g., motivation to disprove a negative stereotype as being true about the self) can simultaneously influence behavior (Strack & Deutsch, 2004). Still, despite general agreement, to date no author has presented an integrated model of how stereotype activation acutely affects individuals. It is one of the goals of this paper to bring together all of the relevant pieces of the puzzle.

Based on the stereotype threat and automatic processes literature, we present an integrated, schematic model of the processes by which stereotype activation affects functioning in Figure 2. We use aspects the idea of baseline reserve capacity (e.g., Staudinger et al., 1995) to illustrate how stereotype activation can affect behavior. Namely, we assume that at any given moment, people's behavior within a given context depends in part upon the psychological and physiological resources they have at their disposal⁷. The means by which stereotype activation affects behavior can be summarized into three general pathways: Stereotypes can affect behavior by (a) stimulating automatic processes

⁷ In an experiment, external context conditions are, at least theoretically, 'fixed'. Thus, it is changes in psychological and physiological resources given an experimentally fixed context that are important here.

through spreading activation, (b) affecting the cognitive resources available for the task, and (c) affecting an individual's motivational resources (e.g., performance expectations, coping strategies). Please note that although the model is not specific to old age stereotype activation, we will focus on the old-age stereotype activation literature to explain the model.

Stereotype activation can stimulate automatic processes through spreading activation. Activating the concept of age can activate the semantic concepts (nodes) related to age. Depending on the prime and the performance measure, stereotype activation can affect performance directly through ideomotor processes or indirectly by spreading activation of related emotional or attitudinal concepts. As previously reported, priming the concept of 'old' seems to activate the associated concepts of 'slow' leading to assimilative performance (i.e., slower movement; Bargh et al., 1996; Dijksterhuis et al., 2000; Dijksterhuis et al., 2001). As another theoretical example, priming age-related losses might automatically activate negative emotions which in turn lead to lower will-to-live.

Stereotype activation can tax cognitive resources via arousal. Stereotype activation can affect performance by eliciting arousal, which in turn taxes cognitive resources such as working memory, mental energy and processing speed. Arousal can occur as the result of explicit worry about confirming a stereotype, as is the case in stereotype threat. Arousal can also be elicited when emotions such as fear or reminders of one's own mortality are raised even without explicit worry. Indeed, both supraliminal (e.g., Blasovich, Spencer, Quinn, & Steele, 2001 with young adults; Auman, Bosworth, & Hess, 2005 with older adults) and subliminal stereotype activation (Levy et al., 2000) can activate the physiological response to stress.

The physiological stress response has a direct, negative effect on working memory capacity (e.g., Luethi, Meier, & Sandi, 2009), which in turn can directly affect performance (Schmader, Johns, & Forbes, 2008). In addition, heightened arousal also stimulates monitoring and regulation as the body attempts to return to its normal state. The individual may search for evidence of whether the stereotype applies to them (monitoring) and may therefore become overly vigilant for signs of failure or anxiety (Schmader et al., 2008). The

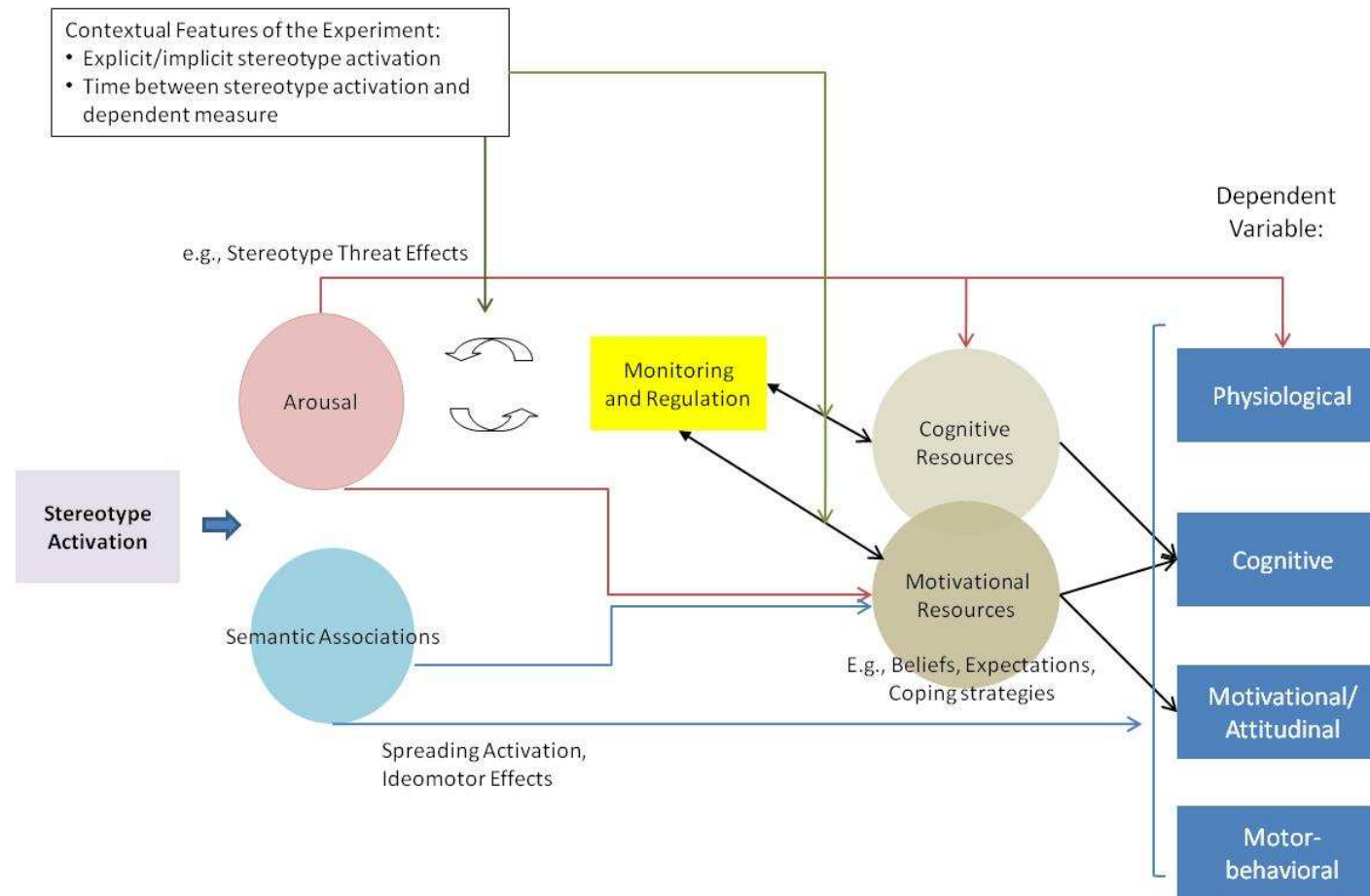
individual may engage in active (though not necessarily conscious) efforts to regulate his or her emotions and physiological state. For instance, younger people who worried about confirming the stereotype (either to the self or to others) tried to suppress their negative emotions (e.g., Johns, Inzlicht, & Schmader, 2008). Monitoring and regulation processes further tax cognitive resources (Schmader et al., 2008), but, if successful, can also lower arousal and have a positive, re-stabilizing effect on cognitive and motivational resources. The extent to which monitoring and regulation have draining versus protective effects on cognitive and motivational resources likely depends in part on whether the age stereotype reminder is processed explicitly or implicitly. More explicit primes would seem to allow for more targeted (and perhaps more successful) regulation. Furthermore, the time between the age stereotype activation and dependent measure also seems likely to moderate the effect of monitoring and regulation.

Stereotype activation can affect motivational resources. Finally, activating stereotypes can also affect motivational resources such as beliefs (e.g., self-efficacy; Pinquart, 2002; Hess & Hinson, 2006), attitudes (e.g., will-to-live; Levy et al., 1999-2000), self-concept (e.g., Rothermund & Brandtstädter, 2003) and motivational resources with regards to a specific task (e.g., performance expectations, Hess, Hinson, & Hodges, 2009; domain identification, effort), which in turn are associated with performance (see Hess, 2006 for a review). This may be the result of spreading activation (e.g., activating the concept of 'wise' activates the feeling of competence), stress responses (e.g., the individual reacts to the stress of an activated negative age stereotype by coping in a certain way, for instance by psychologically disengaging from the task) or as an indirect result of diminished physiological resources (e.g., limitations in the available cognitive resources may limit the effort with which an individual seeks to disprove a stereotype).

Importantly, the three pathways are not mutually exclusive (Steele, Spencer, & Aronson, 2002; Wheeler & Petty, 2001). Still, the relative contribution of each of the three pathways may differ relative to the dependent measure. For instance, differences in more motivational measures (e.g., the will-to-live) are probably more dependent on the

motivational resources pathway than the cognitive resources pathway, whereas differences in more physiological measures (e.g., blood pressure, skin conductance) are probably more dependent upon the arousal pathway.

Figure 2. Integrated conceptual model of stereotype activation.



The Effects of Age Stereotype Activation as a (Developing) Person by Context Interaction:

Potential Moderators

There are certain qualities that seem to make some individuals more or less susceptible to the effects of stereotype activation (Hess et al., 2009). Thus, the effects of stereotype activation need to be approached as a person by context interaction. This is perhaps even more important with regards to age stereotypes which affect (older) adults given the multifaceted and multidirectional nature of adult development (cf. Baltes et al., 2006) and also because age stereotypes eventually, if they do not already, apply to everyone.

In the following, we extend the discussion of how personal characteristics interact with age stereotypes by describing factors that may potentially moderate the effects of age stereotype activation. Moderators of how age stereotype activation affects an individual can be divided into three groups: (a) factors that moderate the extent to which age stereotype cues are interpreted as a threat (or resource); (b) factors that moderate the extent to which individuals are affected by a 'threat' and (c) individual differences in coping with age stereotype activation. These moderators may operate at different levels of awareness. Factors that moderate the extent to which an age stereotype cue is perceived as a threat (or resource) include age identity, domain identification, age associations, proneness to negative information and stigma consciousness. Factors that moderate the extent to which individuals are affected by a 'threat' include the physiological stress response, working memory capacity and inhibition. Finally, individual differences in coping with age stereotype activation include accommodative and assimilative coping strategies, affect balance, emotion regulation goals and abilities. Figure 3 displays the discussed moderators in the integrated model of stereotype activation. We will also consider the normative age trends of some of these moderating factors. Please note that this discussion is meant to be illustrative as opposed to exhaustive.

Factors That Moderate the Extent to Which Age Stereotype Activation Is Perceived as a Threat (or Resource)

Age identity

To date, the most researched moderator of age stereotype activation (as well as the stereotype activation in general) has been stereotype self-relevance. Generally, stereotype activation effects (for stereotypes other than age) are greater for individuals for whom the stereotype is more self-relevant (e.g., Marx & Stapel, 2006; Steele & Aronson, 1995; Wheeler & Petty, 2001). A stereotype can be self-relevant with regards to the stereotyped-identity (e.g., old age). Relative to stereotypes about gender or race, the self-relevance of an old age stereotype is more problematic, given the subjective nature and flexibility of an age identity. Individuals can have more or less 'aging', unlike gender or race. Thus, it is particularly important to consider the self-relevance of an age identity as an inter-individual difference. Indeed, individuals of the same chronological age differ in the extent to which they self-identify as 'old' on both implicit measures of age identity (e.g., Hummert, Garstka, O'Brien, Greenwald, & Mellott, 2002) as well as explicit measures of subjective age (e.g., Montepare, 2009). To complicate matters further, the same individual may have different age identities/subjective ages in different contexts (Whitbourne & Connolly, 1999).

Chronological age, as a proxy of age stereotype self-relevance, has sometimes been found to moderate the effects of stereotype activation. Older participants tended to show stronger effects than younger participants in some studies with implicit stereotype primes (Hess et al., 2004; Levy, 1996; Levy et al., 2000). However, some studies have demonstrated that younger adults may also assimilate to implicit age stereotype activation (Bargh et al., 1996; Dijksterhuis et al., 2000; Dijksterhuis et al., 2001). Perhaps unsurprisingly, it also seems that older people adapt to an old age identity in that, at some point, an old age identity ceases to be threatening (Hess & Hinson, 2006; Hess et al., 2009). These mixed results may indicate that chronological age is not a very good indicator of age stereotype self-relevance, and further that age stereotype self-relevance (in terms of

identity) will no longer exacerbate the effects of age stereotype activation once the individual has come to terms with an old age identity.

To date, only one study has investigated the moderating role of *subjective* age identity on the effects of stereotype activation. In this study, having a young implicit age identity (measured with the implicit association task) did appear to buffer participants from the activation of an old age stereotype (O'Brien & Hummert, 2006). More investigations on age identity are needed. Variables such as age-schematicity (i.e., the extent to which individuals attend to or possess an awareness of their age, Monteparte, 2009) might be useful for this purpose. Indeed, previous experience with age-related decline may limit the worrying effects of explicit stereotype activation (see Auman et al., 2006 for a similar argument). In this vein, *awareness of age-related changes* (Diehl & Wahl, 2010) may moderate the effects of age stereotype activation.

Importantly, age identity is also associated with other psychological resources. For example, age identity correlates with aging self-perceptions and self-efficacy beliefs (Teuscher, 2009). Namely, having a young subjective age seems to be associated with high self-efficacy beliefs as well as more positive aging self-perceptions. It would therefore be fruitful to simultaneously test age identity along with multiple other moderators in order to disentangle the moderating role of self-relevance versus other psychological resources for which age identity is a proxy.

Domain identification

A stereotype can also be self-relevant with regards to the *stereotyped-ability* to the extent that a person values his or her performance in a certain domain (e.g., memory performance), that is, his or her *domain identification* (e.g., Steele, 1997). The results of some studies suggest that the extent to which older adults report valuing their memory moderates their experience of stereotype threat and memory performance following old age stereotype activation (Hess et al., 2003; Hess et al., 2009; Rahhal et al., 2001). However, other studies have failed to demonstrate that domain identification moderates the effects of

old age stereotype activation (Andreoletti & Lachman, 2004; Chasteen et al. 2005; Hess & Hinson, 2006). The null findings may reflect a ceiling effect, as most middle-aged and older adults are concerned about how their cognitive abilities might be changing with age (Hess et al., 2003; Hess & Hinson, 2006; Lachman, 2004; Whitbourne & Sneed, 2002).

Hess and colleagues (2009) argue that education may be a proxy for domain identification with cognitive performance. There is some evidence that level of education moderates the effects of age stereotype activation, with stronger effects among the more highly educated (Hess et al., 2009). Similarly, Andreoletti and Lachman (2004) found that education moderated the effects of old age stereotype activation such that only more highly educated adults were affected by the valence of the stereotype manipulation. This latter result suggests that education, as a proxy for cognitive domain identification, may moderate the relationship between age stereotype activation and performance by affecting the vigilance and sensitivity to stereotype information.

Age associations

Stereotype activation triggers semantically-related concepts, cognitions and emotions. Which concepts, cognitions and emotions are triggered? The semantic associations triggered by age stereotype activation depend on what the particular individual associates with age. This is particularly true for *non-specific* reminders of an age stereotype, (i.e., when participants are reminded of their age or the concept of old age) relative to *specific* reminders of an age stereotype (e.g., task instructions remind participants of the negative age stereotype about memory; subliminal primes of 'wisdom' or 'dementia'). Indeed, evidence suggests that ideomotor effects are dependent upon the strength of the association between a stereotyped category and a particular trait (Dijksterhuis et al., 2000). Stein and colleagues (2002) reached a similar conclusion on the basis of inconsistent results of an implicit priming experiment (Stein et al., 2002). In this experiment, older adults who were unaware that they were in the positive priming condition actually performed *worse* on

two of the five memory tasks. The authors suggested that automatic effects of implicit age primes may depend upon the schematicity (i.e., knowledge structure) of an individual's age stereotypes.

As previously reviewed in Chapter 2, age stereotypes are complex and multidimensional. People hold both positive and negative perceptions of aging that vary considerably across domains (Hummert, 1990; Kite & Johnson, 1988; Kite et al., 1991; Kite et al., 2005). Because people hold complex views of aging, context cues are particularly important in determining *which* semantic associations are triggered. In other words, stereotypes do not exist in a social vacuum—the particular stereotype activated within a person's mind (e.g., old-wise or old-dementia) depends in part upon features of the context (e.g., Casper et al., in press; Gilbert & Hixon, 1991).

Interestingly, experimental evidence suggests that *positive* aspects of aging are more automatically accessible for older adults (Wentura & Brandtstädter, 2003). These results do not contradict other findings that older adults' implicit age associations were as negative as younger adults (Nosek, Banaji, & Greenwald, 2002). Rather, older adults' tend to associate *both* positive and negative concepts with old age, whereas young adults tend to associate a higher proportion of negative concepts. This pattern of lifespan changes suggests that generally speaking, there is more heterogeneity among older adults in terms of the semantic associations activated by reminders of old-age relative to younger adults, whose semantic associations are primarily negative.

The potential moderating role of an individual's age associations has not been investigated with implicit priming paradigms. With regards to explicit stereotype primes, an individual's self-reported anxiety about aging (a proxy for an adult's age associations) did not moderate memory performance after reading mock newspaper articles that either supported negative stereotypes about aging (the inevitability of memory loss) or contradicted such stereotypes (that memory-loss was largely controllable) (Hess & Hinson, 2006). However, *changes in beliefs* moderated memory performance: Older adults whose beliefs became more positive following the stereotype manipulation (as compared with a pre-experiment

baseline) tended to perform better than adults' whose beliefs became more negative. These results suggest that individual age associations can moderate the effects of age stereotype activation.

Proneness to negative information: Positivity bias

Individuals' general sensitivity and vigilance for negative and positive stimuli may affect the extent to which positive or negative stereotypic cues, such as the manipulations in an experiment, are recognized and processed. Relative to older adults, younger adults are also more attuned to negative emotions than to positive emotions, a pattern that has been called a negativity bias (e.g., Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). In contrast to younger adults, older adults seem to be less sensitive to and/or tend to avoid negative stimuli and more sensitive to positive stimuli, a pattern labeled *the positivity effect* (e.g., Carstensen & Mikels, 2005). The positivity effect has been observed with regards to attention, memory and decision-making tasks (Scheibe & Carstensen, 2010). For instance, experience, memory and recognition of negative emotions all tend to decrease with age (e.g., Calder et al., 2003; Charles, Mather, & Carstensen, 2003; Williams et al., 2006). Older adults seem to avoid negative information during initial attention (Mather & Carstensen, 2003). This pattern is also supported by functional brain imaging data which shows that age-related improvements in self-reported emotional stability appear to be related to increases in the controlled processing of negative stimuli and reduction in controlled processing of positive emotion (Williams et al., 2006). Theoretically, the positivity effect should be strongest on tasks that allow for more controlled processing of a stimulus: In order to ignore a negative stimulus, it must first be processed (Scheibe & Carstensen, 2010).

Individual differences (and their age-gradedness) in the emotional domain such as the positivity effect may underlie some of the findings in the old age stereotype activation literature. Individuals who demonstrate a positivity bias may be less vigilant for negative age stereotype information and/or are able to ignore (consciously or not) some negative stereotype activation procedures. The positivity effect seems to occur for low-arousal but not

high-arousal stimuli (Kensinger, 2008; Mather & Knight, 2006). Therefore, any moderating effect of an individual's sensitivity for negative stimuli is less likely to arise when stereotype activation is very threatening (e.g., when the associations between age and serious health risks and/or mortality are activated). The positivity effect may explain findings from Hess and colleagues that older adults were resilient against subtle negative primes, but not blatant stereotype primes (Hess et al., 2004). The subtle negative primes may have been less arousing and thus ignorable due to the positivity bias. This interpretation is somewhat at odds with the observation that the positivity effect should be largest on tasks that allow for more controlled processing of a stimulus (Scheibe & Carstensen, 2010), as blatant primes should allow for more controlled processing. This line of argumentation is demonstrative of the need also to account for individual differences with regards to how an individual copes with the threat.

Stigma consciousness

Stigma consciousness is the belief that one or members of one's social group are stigmatized by others (Pinel, 1999). High stigma consciousness may increase vigilance and sensitivity to negative age stereotype cues (Hess et al., 2009). As expected, higher stigma consciousness exacerbated the effects of negative old-age stereotype activation on memory performance among the young-old group. Amongst the old-old group, higher stigma consciousness was associated with worse memory performance (direct effect but no moderation). The authors interpreted the age differential effects of stigma consciousness as suggestive of potential differences in the role of situational versus more trait-like factors. The authors suggested that old-old adults may become immune to situational factors like an experimental manipulation designed to induce the threat of conforming to an age stereotype, whereas more trait-like factors might continue to affect performance. An alternative interpretation is that stigma consciousness represents a state of "chronic stereotype threat" that old-old adults are less able to inhibit (see next section), and thus demonstrate *worse*

performance whenever they are in a performance situation, regardless of whether they have been exposed to a negative age stereotype cue or not.

Factors that Moderate the Extent to Which Individuals Are Affected by a 'Threat'

Physiological stress response

Several empirical have demonstrated that the activation of a negative (age) stereotype tends to result in a physiological stress response (see Schmader et al., 2008 for a review). In turn, the stress response, as well as its regulation, affects cognitive performance as well as motivational variables. Thus the sensitivity and strength of the stress response represents another individual difference important for our consideration of individual factors that moderate the effects of age stereotype activation.

The hypothalamus-pituitary-adrenal (HPA) axis and the sympathetic nervous system (SNS) are the most important systems for reacting to a stressor (Wolf & Kudielka, 2008). Both the HPA axis response to a challenge (Otte et al., 2005) and the sympathetic nervous system reaction (Esler et al., 2002) significantly increase with age. That is, challenging situations normatively induce more physiological stress for older adults relative to younger adults. Furthermore, HPA activity influences brain regions important for memory. The HPA stress response *facilitates* encoding of emotional information, but *inhibits* memory retrieval (Wolf & Kudielka, 2008). This suggests that when a negative age stereotype represents a threat (another inter-individual difference), older adults will generally react with a greater physiological stress response relative to younger adults. The increased stress response should be most debilitating for the recall of neutral (non-emotional) information, which has often been the performance measure in age stereotype activation studies.

Interestingly, the increase in HPA axis response is three times stronger in older women compared with older men (Otte et al., 2005). The increased physiological stress response of older women relative to older men (Otte et al., 2005), combined with the greater importance of youth and beauty to (aging) women's self-concepts (e.g., Saucier, 2004) and the 'double standard of aging,' that is, that attitudes towards older women are even more

negative than attitudes towards older men (Sontag, 1979), together suggest that old age reminders may generally trigger greater arousal amongst women than men. This contention awaits empirical verification but is illustrative of how factors that moderate the extent to which an old age stereotype represents a threat can interact with the strength of the stress response.

Working memory capacity and inhibition

Recent research suggests that automatic attitudes (i.e. quick and spontaneous associations based on the process of spreading activation in an associative network, as opposed to reflective, controlled attitudes; Strack & Deutsch, 2004) have a stronger influence on behavior and self-regulation for those with lower working memory capacity (at least among young adults) (Hofmann, Gschwendner, Wiers, Frieze, & Schmitt, 2008). Environmental stimuli may automatically predispose a person toward a specific course of action via the activation of automatic attitudes and associated behavioral schemas (Strack & Deutsch, 2004). At the same time, individuals may harbor more reflected (controlled, explicit) attitudes as well as specific self-regulatory goals about the proper course of action in a given situation. The extent to which controlled dispositions 'win out' over automatic attitudes and impulses depends on working memory capacity, as working memory capacity is needed to both inhibit automatic dispositions as well as to maintain controlled dispositions in an active state so that they can be used as a standard of reference for behavior monitoring and execution (Hofmann et al., 2008).

Applying this argument to the example of age stereotype activation, reminders of a negative age stereotype may, on an automatic level, evoke arousal and the behavioral impulse to withdraw resources from a task (e.g., a memory test in an experimental setting). At the same time, an individual may have reflected attitudes that the negative age stereotype does not apply to everybody and the self-regulatory goal to concentrate on the task and do well. The extent to which these more reflected attitudes and goals are translated into behavior (e.g., memory performance) depends in part on the individuals' working

memory capacity as one of the determining factors of the extent to which the individual can inhibit (negative) automatic attitudes as well as keep his or her (perhaps more positive) reflected attitudes and goals active.

Over the life span, working memory capacity tends to decrease (Salthouse & Babcock, 1991; Reuter-Lorenz & Sylvester, 2005), suggesting that ideomotor and other automatic effects may increase with age (see also Zebrowitz, 2003). More specifically, declines in inhibitory functioning with age are well established in the literature (Baltes et al., 2006). Older adults have greater difficulty disengaging from or inhibiting distracting information relative to younger adults (Person, Lustig, Nelson, & Reuter-Lorenz, 2007). It has been suggested that older adults' decreased ability to inhibit activated associations explains differences in implicit measures of racial bias: Older adults tend to be more affected by implicit stereotype primes relative to younger adults, even when their implicit associations between racial groups and positive or negative traits are less stable or weaker (Sherman et al., 2008). Similarly, older adults may be more susceptible to implicit age stereotype primes relative to younger adults.

Inhibition and the effect of anxiety. When reminders of an age stereotype activate arousal and feelings of anxiety, individuals' ability to inhibit anxiety should moderate performance following age stereotype activation. Anxiety differentially affects younger and older adults' cognitive performance. For instance, cognition-related anxiety negatively affected recall only for older and middle-aged adults in a community sample, even though there were no age differences in the level of anxiety related to cognitive testing (Andreoletti, Veratti, & Lachman, 2006). These results concur with Hogan (2003), who found that greater anxiety was associated with poorer performance on a divided attention task for older, but not for younger adults—even though younger adults had higher levels of anxiety. The decrease in inhibitory functioning seems to underlie the differential impact of anxiety on older and younger adults' cognitive performance.

The age-related increase in the interfering effect of anxiety on cognitive performance suggests that the arousal caused by a stereotype reminder plays an important mediating

role by which age stereotype activation affects cognitive performance. However, results to this effect have been mixed. Domain-specific self-reports of anxiety have been found to mediate how explicit reminders of age stereotypes affect performance (Hess et al., 2003; Hess et al., 2004), but self-reports of general anxiety have not (Abrams et al., 2006; Chasteen et al., 2005). Other studies have also found that non-verbal measures of anxiety but not self-reported anxiety appeared to mediate performance following negative stereotype activation (Bosson, Haymovitz, & Pinel, 2004) though this could not be replicated in an old age stereotype activation experiment (Hess et al., 2009). It seems important that self-report measures assess domain-specific anxiety as closely as possible to the actual cognitive performance or to use unobtrusive/physiological measures of anxiety.

In sum, we suspect that working memory resources and specifically inhibition moderate the effects age stereotype activation (see also Zebrowitz, 2003). First, we suspect that subliminal age stereotype primes (positive or negative) have a greater effect on individuals with lower working memory capacity and lower inhibition. Secondly, we suspect that age stereotype activation will have the most deleterious effects on people who simultaneously perceive the reminder as a threat (i.e., such that the age stereotype activation evokes anxiety) and who have the lowest working memory capacity such that they are less able to inhibit the anxiety. Still, we underline the importance of simultaneously considering multiple moderators, including how a person reacts to the threat. We now turn to individual differences in coping with age stereotype activation.

Individual Differences in Coping with Age Stereotype Activation

Assimilative and accommodative coping strategies

At a very general level, coping strategies can roughly be grouped as either accommodative or assimilative responses (e.g., Brandtstädter, 2006; Brandtstädter & Greve, 1994; Brandtstädter & Renner, 1990; Brandtstädter & Rothermund, 2002). Assimilative coping strategies involve active attempts to alter unsatisfactory life circumstances and situational constraints in accordance with personal preferences. In contrast, accommodation

coping strategies involve adjusting the self to be more in line with the situational constraints, including disengagement from blocked goals, adjusting one's aspirations and self-evaluative standards, and selectively reduce or increase the attractiveness of certain self-aspects. In other words, when faced with a threat, individuals can choose to try to change the threatening context (e.g., disprove a stereotype) or adjust *themselves* (e.g., adjust their self-evaluative standards, using self-enhancing comparisons, positive reappraisal). Individuals' tendency and ability to use certain types of assimilative versus accommodative coping strategies may moderate the effects of age stereotype activation. For instance, an accommodative coping style is associated with downgrading the personal importance of a particular domain in which one feels threatened and/or positively reappraising the given situation and may therefore affect how stereotype activation affects an individual (Rothermund, 2005). People with an accommodative coping style may react to a negative age stereotype cue by downplaying the importance of performance on the experimental task and perhaps devoting less effort to doing well. Experimental evidence also suggests that in old age, positive connotations of the concept "old" become more automatically accessible for people with a stronger accommodative style, especially for people who categorized themselves as "old" (Wentura & Brandtstädter, 2003). Therefore, accommodative coping might shield some individuals from the detrimental effects of the arousal pathway as well as some of the psychological effects of negative age stereotype activation (e.g., effects on the self-concept) but might also be detrimental to performance on other sorts of dependent measures such as cognitive tasks.

Individuals' ability and tendency to *positively reappraise* negative experiences (an accommodative strategy) is particularly relevant to our discussion of stereotype activation. Reappraising negative emotions has been shown to moderate the extent to which arousal affects performance following stereotype activation. For example, instructing women and minorities that anxiety would not harm their performance eliminated their efforts to suppress their anxiety (Johns et al., 2008). The instruction to positively reappraise anxiety restored cognitive resources (working memory) and predicted better test performance. In another

recent study, women's sympathetic nervous system activation (measured by levels of alpha amylase in their saliva) was measured prior to a practice GRE test (Schmader, Forbes, Zhang, & Mendes, 2009). For women who typically reappraise their emotions, the higher their sympathetic activation going into the test, the better they performed on the test. Higher sympathetic activation predicted poorer test performance only among women who had not reported reappraisal intentions. These results show that the tendency to (proactively) cope with a stressful situation through positive reappraisal can help translate arousal into a performance boost.

Aging generally corresponds with a gradual shift from assimilative to accommodative coping strategies (e.g., Brandtstädter, 2006; Brandtstädter & Greve, 1994; Brandtstädter & Renner, 1990; Brandtstädter & Rothermund, 2002; Wrosch, Heckhausen, & Lachman, 2000). That is, in comparison to younger adults, older adults tend to demonstrate an accommodative coping style (i.e., accepting the situation and adjusting the self) in the face of actual or expected adversity or failure. Initial experimental evidence also suggests that success at positive reappraisal increases with age (Shiota & Levenson, 2009). Thus, to a certain extent, older adults may be normatively more able to positively reappraise the stress aroused by a negative stereotype prime, provided that arousal levels are not so high as to overwhelm the individual's physiological resources (stress response, inhibition).

Older adults' tendency to use accommodative coping strategies may represent a primary difference between how younger adults and older adults react to stereotype activation. While younger adults may react to a negative stereotype with even greater efforts to monitor the situation and regulate their emotions and performance (a strategy which can backfire), it seems likely that older adults generally react to a negative stereotype by adjusting *themselves*. Some accommodative strategies like positive reappraisal tend to increase with age and may help some older adults to be relatively resilient in the face of a negative stereotype. However, other accommodative strategies such as withdrawing resources from the task at hand may not be particularly effective, at least with regards to tests of cognitive task performance (as opposed to e.g., measures of subjective well-being).

Tenacious adherence to previously adopted goals and performance standards (i.e., assimilative coping responses) should be expressed most strongly in domains that are central to the older person's identity, as well as in areas of performance subject to normative expectations (Brandtstädter & Rothermund, 2002). As previously mentioned, there have been mixed findings as to whether domain identification moderates the effects of age stereotype activation. The mixed findings suggest that individuals' coping styles also need to be taken into account in order to predict how people react when a valued aspect of their identity is threatened by a negative age stereotype.

Distancing oneself from the stereotyped group and/or stereotype content

Negative stereotypes can be sometimes be used as a reference standard for self-enhancing downward comparisons (e.g., Heckhausen & Krueger, 1993; Heidrich & Ryff, 1993; Rickabaugh & Tomlinson-Keasey, 1997; Robinson-Whelen & Kiecolt-Glaser, 1997). The contrast effect can be expected when adults (are able to) distance themselves from either the *stereotype content* ('does not apply to me') or the *stereotyped group* ('I am not old') (i.e., inoculation, Zebrowitz, 2003).

People who have positive aging self-perceptions seem more likely to use negative stereotypic information as the basis for self-enhancing downward social comparisons. For example, in one study older adults (aged 60 to 94 years) were presented with either negative or neutral stereotypical information about competence in old age (Pinquart, 2002). For the participants who found that the negative information applied to them, the negative information led to more negative self-perceptions (assimilation effect). However, for the other participants, the negative age stereotype cue actually *improved* self-efficacy (contrast effect). These results suggest that adults may sometimes react to an age stereotype by distancing themselves from the stereotyped content (e.g., the stereotype content does not apply to me). As in the previous example, distancing oneself from a negatively stereotyped group can result in *stereotype lift*– the performance boost that can occur when downward social comparisons are made with a denigrated out-group (Walton & Cohen, 2003). Younger

and middle-aged adults can approach a negative age stereotype by emphasizing that it does not apply to them; that is, by distancing themselves from the old age category (Rothermund, 2005; Zebrowitz, 2003). This strategy, however, becomes less viable in older ages.

Indirect evidence of distancing reactions comes from research which suggests that the relationship between chronological age and susceptibility to explicit old-age stereotype activation seems to be U-shaped (Hess & Hinson, 2006). Adults in their 60s (the young-old) exhibited weak threat effects. Middle-aged adults actually seemed to *profit* from the salience of a negative old age stereotype. This pattern suggests that the middle-aged adults in the study reacted to the salience of the age stereotype by distancing themselves from the old-age group, leading to the observed contrast effects. Still, even at relatively young ages, adults may worry that they are beginning to show signs of aging and may be thus especially vigilant for signs that an aging stereotype applies to them. This might result in more “similarity testing” between the self and the old-age stereotype, leading to more assimilation (cf. Mussweiler, 2003). In this vein, some evidence even suggests that younger adults are even more concerned about aging and death than older adults. For instance, mortality salience has a greater impact on a variety of measures for younger adults, but not for older adults (Maxfield et al., 2007). Thus, distancing oneself from an age stereotype seems to be best conceptualized as an individual coping strategy as opposed to a strategy generally associated with particular age groups (e.g., younger or middle-aged adults).

Emotions: Affect balance and emotion regulation

Affect balance. Having a more positive emotional balance may raise the probability that an individual assimilates to an activated (age) stereotype. Why is that? Positive moods facilitate more heuristic forms of processing that are relatively more dependent on activated or salient information, relative to negative moods. For instance, positive mood increased reliance on stereotypic constructs, relative to sad mood (Bodenhausen, Kramer, & Süsser, 1994). In contrast, negative moods tend to lead to more local processing and hence to contrast effects (Avramova & Stapel, 2008).

Normatively, younger adults experience a higher level of overall negative affect compared to successive age groups, with the age trend leveling off in early old age (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Gross, Carstensen, Pasupathi, Tsai, Gotestam Skorpen, & Hsu, 1997; Mroczek & Kolarz, 1998; Pinquart, 2001). Age differences with regards to positive emotion appear to be smaller (Griffin, Mroczek, & Spiro, 2006; Kunzmann, Little, & Smith, 2000; Pinquart, 2001). Older adults' normatively lower level of negative affect may make contrast effects based less probable. Older adults' normatively more positive emotional balance (e.g., Carstensen et al., 2000; Lavouvie-Vief & Medler, 2002) may render older adults more susceptible to assimilation effects relative to younger adults.

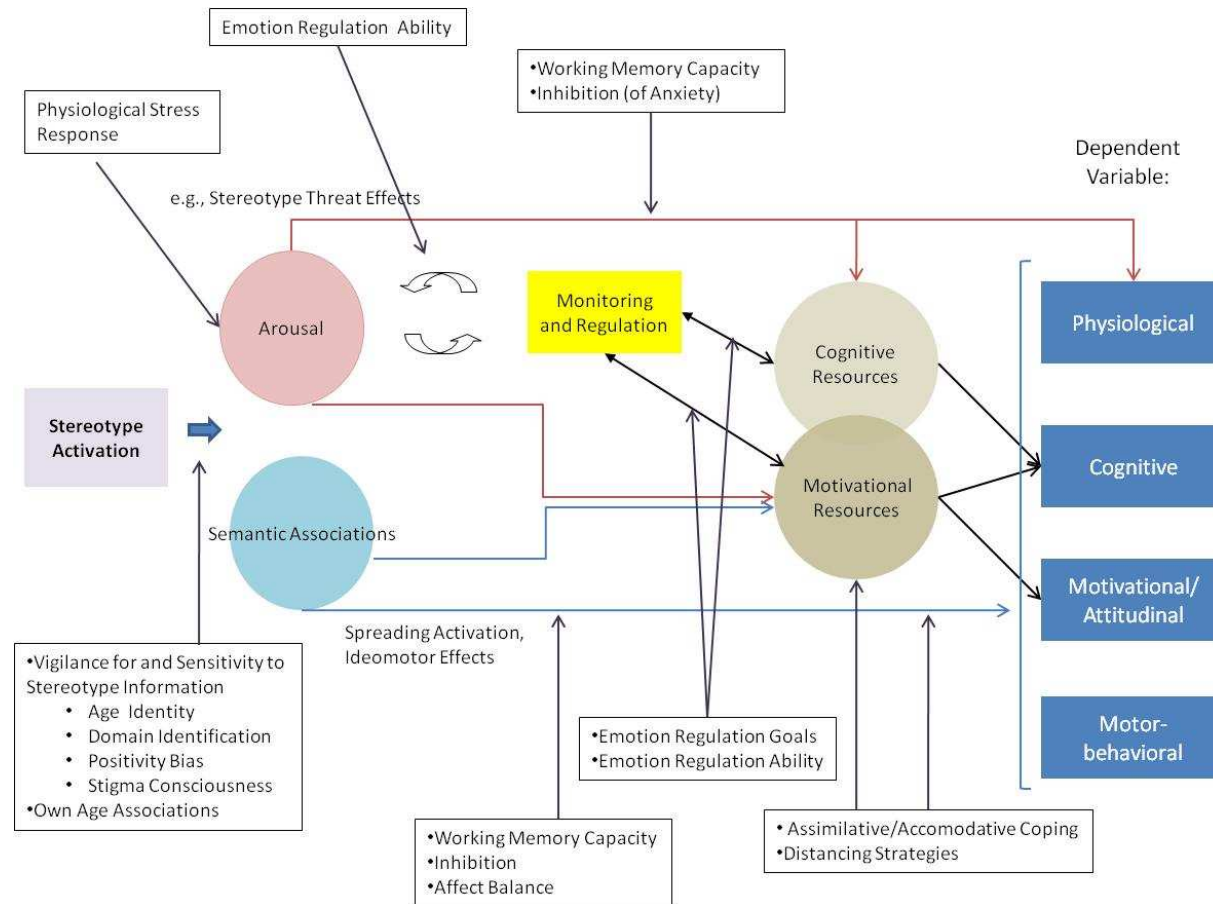
Emotion regulation goals and ability. One way in which the salience of a negative stereotype affects acute functionality is by stimulating emotion regulation and thus draining cognitive resources like working memory (e.g., Schmader et al., 2008). Thus, individuals' ability to successfully regulate their emotions should moderate the extent to which particularly negative age stereotypes affect their behavior.

Older adults report a higher ability to control their emotions and to maintain a neutral emotional state (Gross et al., 1997; Kessler & Staudinger, 2009; Lawton, Kleban, & Dean, 1993). Data supports the contention that emotion regulation requires less effort with age. For example, explicit instructions to reduce negative feelings after a disgust induction diminished young adults' performance on a working memory task, but not older adults' performance (Scheibe & Blanchard-Fields, 2009). However, online measures of emotion regulation suggest that there are no objective changes in the ability to regulate emotions (Kunzmann, Kupperbusch, & Levenson, 2005), thus whether improvements in emotion regulation *normatively* take place remains an open question.

High emotion regulation ability may be one factor that helps protect individuals against the effects of negative age stereotype activation, at least when emotions are experienced on the level of awareness and individuals have enough resources (e.g., time, cognitive resources) to regulate their emotions. An age-related increase in emotion

regulation ability may be one explanation for the inconsistent results of negative age stereotype activation experiments as some older adults may be able to efficiently regulate any negative emotions caused by a negative age stereotype cue.

Figure 3. Potential moderators of stereotype activation.



Conclusion and Outlook

Many studies have demonstrated the effects that age stereotype activation can have on older adults (cf. Horton et al., 2008), though there have been many inconsistent results in the literature. So far, the effects of age stereotype activation have been primarily explained as the result of stereotype threat, self-stereotyping or ideomotor processes. To date these mechanisms have been considered independently of the developmental changes occurring across adulthood. The current article has presented an integrated model by which old age stereotype cues affect adults and reviewed how some individual characteristics might affect individual vulnerability as well as resilience in the face of age stereotypes activation. People differ with regards to their psychological and physiological resources which may protect them or make them especially vulnerable to the effects of age stereotype activation.

We have outlined a number of factors that might exacerbate the effects of negative stereotype activation for older adults (e.g., increased stress reactions, reduced inhibition) but also protective factors (e.g., improved emotion regulation, increased accessibility of the positive aspects of aging). It is not enough to only consider one dimension in order to make the correct prediction, as resources are linked together and/or may interact in important ways. Importantly, the psychological and physiological moderators we have detailed change over the course of the life span. We do not want to give the impression that all adults experience changes in *all* of the dimensions mentioned above, nor that older adults as a group behave in a homogenous way. In fact, we can expect more variance among older adults' reactions to reminders of age stereotypes relative to younger adults.

Integrating adult developmental trends and pathways of stereotype activation

On the whole, it seems that the adaptive qualities of the aging self which are protective of arousal are also protective against certain pathways by which stereotype activation can (negatively) affect behavior. Normatively speaking, it seems that older adults do not have the same proneness for negative emotions as younger adults and generally

react to threats to their self-esteem through accommodative coping strategies such as positive reappraisal. This interpretation seems fair when comparing the relative effect sizes of explicit versus implicit stereotype primes (Hess et al., 2004), as explicit primes allow for deliberate coping (which seems to normatively improve with age). However, if the stereotype *is* perceived as extremely self-threatening, for instance, for adults for whom youth or cognitive performance is a core part of their self-identity, age stereotype activation should be even more debilitating given age-related increases in the stress response, decreased ability to inhibit disruptive thoughts, and greater cognitive interference of anxiety. Here, we underline the need for considering how moderating factors that affect the extent to which an age stereotype cue is perceived as a threat or resource (e.g., age identity, age associations, domain identification) interact with how individuals react to and cope with threats (e.g., physiological stress response, coping strategies).

Ironically, the reliance on accommodative strategies that protect individuals from experiencing performance decrements based on the arousal pathway may lead to assimilation to stereotype activation primes by the more automatic pathways. Older adults' normatively more positive emotional balance (Carstensen et al., 2000; Lavouvie-Vief & Medler, 2002), decreased working memory capacity (Reuter-Lorenz & Sylvester, 2005), and decreased inhibition (Person et al., 2007) are other potential risk factors that may *increase* assimilation effects particularly for age stereotype primes that are processed below the level of awareness.

Instead of reductionist 'either-or' arguments, future research should consider how stereotype activation affects performance via *both* 'hot' and 'cold' pathways. Contextual cues in the immediate environment influence which internal, automatic association(s) will be activated within a network of both positive and negative semantic associations. We therefore caution that results from laboratory priming experiments (especially those that use non-ambiguous, subliminal primes like 'wisdom' or 'senile') should not be used to downplay the importance of contextual cues in the immediate environment (e.g., task instructions) in triggering performance decrements.

We feel that many of the null and contradictory findings in the literature on old-age stereotypes can be at least partially explained by a scientific approach that has typically compared experimental conditions while ignoring the way *developing* individuals differentially react to age stereotypes. While a between-condition approach has generally proven sufficient for demonstrating conditional differences between groups of relatively homogenous samples (i.e., first-year university psychology students), such an approach seems insufficient for understanding how older adults react to old age stereotype activation. Future studies should take care to consider multiple moderators as well as how they are linked together and interact. The recent study of Hess and colleagues (2009) demonstrates a positive step in this direction.

Negative age stereotypes are highly prevalent across various age groups and societies (e.g., Filipp & Mayer, 1999). Identifying possible moderators of the relationship between age stereotype activation and physiological, psychological and cognitive outcomes is of high societal relevance, particularly given the potential of such research to contribute to designing interventions (Rothermund, 2005). It would be especially fruitful to investigate the role of variables central to adult development and lifespan psychology in the stereotype activation process in order to gain a better understanding of how age stereotypes affect developing individuals.

This chapter has focused on how acute reminders of age and images of aging (specifically, contextual reminders of an age stereotype) affect acute functionality as part of individuals' baseline reserve capacity. Age stereotype cues affect the physiological and psychological components of an individual's baseline resources. In line with the meta-theoretical framework laid out in Chapter 4, this chapter has demonstrated that components of an individual's reserve capacity are linked and need to be considered in relation to each other. For instance, resources that make an age stereotype cue a threat need to be considered in relation to resources that affect how the threat affects the person, as well as how the person copes with the threat. In the next chapter, I explore how images of aging

affect individual development over the long-term as part of individual's *developmental* reserve capacity.

Chapter 6

Images of Aging as Components and Determinants of Individuals' Developmental Reserve Capacity

In the last chapter, I reviewed evidence that images of aging (specifically, contextual reminders of age stereotypes) can be considered part of, as well as determinants of, an individual's baseline reserve capacity. Images of aging have also been empirically associated with the accumulation or disintegration of resources across ontogenesis. Empirical survey research has linked images of aging at one point of time with developmental trajectories of indicators of overall adaptive capacity, namely, various indicators of health (e.g., Levy, Slade, May, & Caracciolo, 2006; Levy, Slade, Kunkel, & Kasl, 2002b; Levy, Zonderman, Slade, & Ferrucci, 2009; Wurm et al., 2007) and longevity (e.g., Kotter-Grühn et al., 2009; Levy et al., 2002a, Maier & Smith, 1999). For example, self-views that characterized aging as a process of physical loss were significantly related to increases in physical illnesses six years later, whereas self-views of aging as a process of ongoing personal development led to smaller increases or even decreases in the number of self-reported illnesses (Wurm et al., 2007). In this study, aging attitudes impacted health more than the other way around, and the predictive strength of aging attitudes remained significant even after controlling for hope. Similarly, young and middle-aged adults (aged 18 - 49 years) with more negative old age stereotypes were significantly more likely to experience a cardiovascular event (e.g., angina attack, stroke) over the following 38 years than adults with less negative old age stereotypes even after adjusting for a number of relevant covariates (Levy et al., 2009). With regards to longevity, a number of studies have demonstrated that positive aging self-perceptions predict longer lives. For instance, people who perceived their own aging positively at midlife lived on average a startling seven years longer than people who perceived their own aging more negatively, even after controlling for socioeconomic and health variables (Levy et al., 2002a). This effect was partially mediated by the will-to-live. As a last example, people with more positive aging self-perceptions at

baseline were also more likely to engage in preventive health behaviors like eating a proper diet and exercising over the following 28 years, even after controlling for age, education, functional health, gender, race, and self-rated health (Levy & Myers, 2004). The connections between images of aging (e.g., aging self-perceptions) and developmental trajectories of health and longevity demonstrate that images of aging also constitute part of individuals' developmental reserve capacity.

How do images of aging translate into developmental trajectories? Images of aging are 'bundled' together with other resources and contribute to the rate of growth (or decline) of an individual's reserve capacity over time (cf. Hobfoll, 2002). Drawing on lifespan work on resilience and reserve capacity (Staudinger et al., 1995), I illustratively discuss the link between images of aging and other developmental resources to illustrate how images of aging affect developmental trajectories: (a) by affecting the meaningfulness of actions, (b) by affecting motivational orientation, (c) by affecting comparison standards and preferences, (d) as sources of stress, as well as (f) by affecting selection to external contexts that differentially facilitate accumulation (or disintegration) of individual resources.

Meaningfulness of Action

Images of aging can affect the meaningfulness of particular actions. The extent to which a person believes that aging is a process of progressive, inevitable, irreversible loss is also presumed to correlate with the extent to which one believes in his or her ability to personally influence the future (i.e., his or her internal control beliefs and/or self-efficacy beliefs) (Wurm et al., 2007). Believing that aging is inherently associated with losses can lead to low outcome expectancies of individual action. In other words, images of aging affect the perceived *meaningfulness* of action ("What's the point?"). In this vein, believing that health problems are inevitable in old age has been associated with older individuals' tendency to engage in fewer preventive health measures (Leventhal & Prohaska, 1986; Levy & Myers, 2004; Sarkisian, Hays, & Mangione, 2002). In one study, older adults in a community-based sample who associated normal aging with cognitive and physical health

problems were less likely to report that they would discuss these health problems with their physician relative to those who did not associate these health problems with normal aging (Sarkisian et al., 2002). As a further example, employees' age-related beliefs about their ability to learn is assumed to affect their willingness to participate in further training in part because they may be unsure that they will gain something from participation (Wrenn & Maurer, 2004).

Beyond affecting perceptions of the *utility* of certain behaviors, images of aging can also affect individuals' expectations of how their actions will be rewarded. At a global level, aging self-perceptions have been associated with the will-to-live (Levy et al., 1999-2000; Levy et al., 2002a), which can be considered the expected 'reward' of continued life. Beliefs about how *other* people will perceive a particular behavior can be a major guide as to how and in which domains one invests his or her resources. A key criterion for desiring or fearing any possible future self is its positive or negative social value, which in turn determines its potential to enhance or reduce self-esteem (Leary & Baumeister, 2000). People tend to invest in domains where they expect the most social and self-esteem gains. Individuals are thus affected by socio-cultural values which determine the desirability of alternative possible selves (Oyserman & Fryberg, 2006). Images of aging in the form of age norms and age stereotypes may direct people to invest in certain domains and prioritize certain goals. As an illustrative example, social devaluation of sexuality in older ages may deter older individuals from investing in this domain because this investment is not socially rewarded. Indeed, negative societal attitudes with regards to older people's sexuality are thought to influence how older people perceive their own sexuality and to be a key determinant of sexual behavior (DeLamater & Moorman, 2007).

An empirical study of older adults' generative behavior nicely illustrates how age meta-stereotypes can affect resource investment in particular domains. With age, the generativity motive seems to increase in importance (e.g., McAdams, de St. Aubin, & Logan, 1993; Sheldon & Kasser, 2001). However, a recent study suggests that the relationship

between older people's generative acts and subjective well-being appears to be dependent on their perceptions that the younger generation respects the older generation (i.e., their age meta-stereotypes) (Cheng, 2009). Over time, older people who felt that the younger generation did not respect the older generation tended to decrease their generative concern, indicative of goal disengagement.

A third way in which images of aging can affect the meaningfulness of actions is through future time perspective (Wurm et al., 2007). Positive images of aging are thought to be associated with a more expansive time perspective (Wurm et al., 2007). A sense of diminishing time (e.g., to live, to work) can make investing in growth-related activities that require sacrifices of time and effort seem less worthwhile when one has less time to 'reap the benefits'. A diminishing sense of time may also motivate individuals to optimize the present. What 'optimize' means is, of course, a subjective question, though people tend to optimize positive affect when facing (perceived) time constraints (Carstensen, Isaacowitz, & Charles, 1999). Given time constraints, the desire to optimize positive affect may outweigh any future potential consequences associated with a particular action. As a theoretical example, an older worker may be more inclined to stay in a familiar environment with close colleagues rather than take on a new position because he or she expects to have little time to benefit from a potentially better position and prioritizes his or her current emotional well-being over and above any potential career-related growth.

In sum, images of aging can affect the meaningfulness of action. Images of aging are linked with control and self-efficacy beliefs, expected rewards, and future time perspective. Images of aging can motivate—or de-motivate—particular actions that in turn affect development. By affecting the meaningfulness of actions, images of aging can affect development through behavioral pathways. People tend to select and pursue goals in which they expect to achieve at least some degree of success (Brandtstädter, 1998). This becomes even truer with increasing age, as the individual must adapt to shrinking resources by more carefully prioritizing his or her most important goals (e.g., Brandtstädter, 2006; Freund, 2008; Hess, 2006).

Motivational Orientation

Researchers within both the developmental psychology and social cognition literatures have distinguished between two motivational orientations, one oriented towards the achievement of gains and the other oriented towards the avoidance of losses (e.g., Baltes et al., 2006; Ebner, 2005; Freund & Ebner, 2005; Higgins, 1997, 1998). In both the short-term and over the long-term, images of aging that emphasize the negative aspects of aging and possible losses associated with aging may orient the individual towards avoiding losses, whereas images of aging that emphasize the possibility of continuous gains may direct individuals towards trying to achieve the positive potentials of aging. For instance, it has been argued that the cultural idolization of youth in the Western world encourages aging adults to partake in “age-resisting” (e.g., avoidance of physical signs of aging through use of cosmetics) as opposed to “age embracing” cultural practices (Gilleard & Higgs, 2000). Experimental research has demonstrated that activating a positive, self-relevant stereotype activates a situational motivational orientation towards approaching gains, whereas activating a negative, self-relevant stereotype activates a motivational orientation towards avoiding losses (Seibt & Förster, 2004). It seems reasonable to assume that *chronic* exposure to positive and negative images of aging likewise shape *chronic* motivational orientations. Chapter 9 uses empirical data to substantiate the proposed connection between images of aging and chronic motivational orientation.

In sum, images of aging are associated with motivational orientations. In turn, motivational orientations are associated with a range of outcomes, including individuals’ sensitivity to the presence of absence of positive and negative outcomes, their strategies for achieving their goals, their attraction to certain kinds of tasks and environments, the kind of errors they make, the emotions they experience and how they react to failure (e.g. Higgins, 1997). Maintaining a motivational orientation oriented towards achieving new gains would seem to be important for the acquisition of new developmental resources earlier in life that

become especially crucial for functionality as age-related losses begin to threaten resources later in life (cf. Freund, 2008).

Comparison Standards and Preferences

People often measure themselves against other people or reference groups. As discussed in Chapter 3, negative age stereotypes can in some instances serve as a reference standard for self-enhancing downward comparisons. Somewhat ironically, negative age stereotypes can lead to higher levels of subjective well-being when they are used as a basis for self-enhancing comparisons. Viewing the self as “better off” than a generalized older person has tended to predict higher levels of subjective well-being (e.g., Heidrich & Ryff, 1993; Kwan et al., 2003; Rickabaugh & Tomlinson-Keasey, 1997; Robinson-Whelen & Kiecolt-Glaser, 1997; Ryff & Essex, 1992). However, the overall adaptiveness of using negative age stereotypes has to be considered relative to other outcomes besides feelings of well-being in a given moment. Downward comparisons help to reinforce the status quo as opposed to motivate the individual towards possible gains. While downward comparisons may be highly adaptive in situations of irreversible losses or unattainable gains, upward comparisons (i.e., role models) are functional whenever maintenance or improvement is at stake (Baltes et al., 2006). People with positive images of aging may pose a threat to the self-concepts of people with more negative images of aging. Likewise, people with more positive images of aging seem more likely to seek out positive role models. In Chapter 10, I explore how the similarity in aging self-perceptions between an employee and his or her supervisor is related to the employee’s intentions to leave their current work context.

Sources of Well-being and Stress

Positive images of aging seem to be protective of developmental reserve capacity by fostering positive expectations for the future and feelings of control. Having a sense of control and an optimistic future outlook have direct positive effects on well-being indicators (e.g., Scheier & Carver, 1992; Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000), even for

centenarians with a truly limited future time perspective (Jopp & Rott, 2006). Indeed, positive aging self-perceptions predicted physical recovery after an acute myocardial infarction, even after controlling for potentially relevant covariates. This effect was mediated by recovery expectations (Levy, et al., 2006).

In contrast, negative images of aging can be a source of psychological stress and anxiety (e.g., Levy, 2009; Wurm et al., 2007), which can deteriorate developmental reserve capacity. Particularly for older adults, psychological stress is linked to immune down regulation, which can lead to health impairments (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002). Evidence that negative age stereotypes act as a direct stressor has been provided by experimental studies that demonstrated that subliminally priming older adults with positive stereotypes of aging (e.g., “wisdom”) led to lowered physiological stress responses in the face of a challenging cognitive task (Levy et al., 2000; Levy et al., 2008). Having negative attitudes towards old people predicted low self-esteem, even after controlling for self-reported health problems and other age-related changes (Ward, 1977).

Interestingly, both age stereotypes and aging self-perceptions seem to independently contribute to well-being. In one study, adults’ image of their own aging, their image of the “typical old person” (i.e., age stereotype) and the interaction of these two factors were each independently associated with depressive tendencies (Rothermund, 2005). The significant interaction effect indicated that negative age stereotypes about the “typical old person” amplified the negative impact of perceived self-deficits on depression, whereas relatively positive age stereotypes had a buffering effect. These findings are demonstrative of the developmental relevance of images of aging because they to some extent characterize the possibilities for one’s future development (e.g., if self-deficits are going to get better) (Brandtstädter & Greve, 1994; Brandtstädter et al., 1999; Rothermund & Brandtstädter, 2003; Wentura & Rothermund, 2005; Wurm et al., 2007).

Selection to Facilitative External Contexts

Images of aging may affect selection processes to external contexts that are differentially supportive of positive development. External contexts vary in the extent to which they support prevention against and/or compensation of age-related losses as well as help individuals to realize potential gains. Images of aging might affect individuals' *access* as well as *attraction* to particular external contexts. For instance, managers' negative stereotypes with regards to older workers' ability to learn and motivation to participate in learning activities are thought to affect older workers' access to the contextual resources (e.g., training courses) that could potentially mitigate age-related changes in cognition (Maurer et al., 2003). Clinicians' age-related stereotypes can affect their diagnostic and therapeutic decisions (e.g., with regards to depressive symptoms, Linden & Kurtz, 2010). A series of laboratory and field studies revealed that caretakers' old-age stereotypes guided caretakers' interactions with their elderly partners in ways that supported dependency as opposed to fostering autonomy (e.g., M. Baltes & Wahl, 1992). These examples illustrate how *other* people's images of aging can affect individuals' access to the kinds of contexts (e.g., further training opportunities, new romantic partner, medical attention, caretakers that support autonomy) that can differentially contribute to the growth, maintenance or decline of an individual's developmental reserve capacity.

The relationship between images of aging and intergenerational relationships provides a further example of how images of aging can affect access to contexts that support positive development across the full range of the life span, both for members of younger and especially for members of older generations. Being productive (see Staudinger, 2008 for a discussion of psychological productivity) in a way that benefits members of younger generations, including fulfilling a respected role as a purveyor of wisdom, can help to give life meaning in the face of one's own mortality. Indeed, passing on advice to members of the younger generation seems to increase older people's positive affect, self-esteem and life satisfaction (e.g., Kinnevy & Morrow-Howell, 1999). An experimental study demonstrated that intergenerational settings in which older adults' played an 'expert' role

increased older adults' affective complexity and fluid intelligence (Kessler & Staudinger, 2007). Intergenerational interactions can also contribute to younger interaction partners' positive development: The adolescent partners in this study reported more communion goals and demonstrated more pro-social behavior. In addition, older people's transmission of socio-cultural knowledge to young people is also thought to increase off-springs' survival rates (Mergler & Goldstein, 1983).

Images of aging can affect the frequency and quality of intergenerational encounters. For instance, younger people's negative old-age stereotypes can affect the extent to which they seek out contact with the older generation (e.g., McCann, Dailey, Giles, & Ota, 2005). Furthermore, the relationship between older people's generative acts and subjective well-being appears to be dependent on their perceptions that the younger generation respects the older generation (Cheng, 2009). Cultural norms regarding what is 'age appropriate' and age-graded social roles can contribute to age homogenous social contexts (e.g., schools, circle of friends, work places, pubs) which limit the probability of intergenerational encounters, which are currently rather infrequent, especially outside of the family (Hagestad & Uhlenberg, 2005).

An individual's images of aging also affect their *attraction* to certain contexts. People tend to prefer environments that help them to sustain existing self-concepts, allow them to express their personality traits and attitudes, and help them to achieve their personal goals (see Ickes, Snyder & Garcia, 1999 for a review). People with more positive images of aging are more likely to seek out—and want to stay—in contexts that support the achievement of their positive images. The idea that images of aging can affect individuals' attraction to certain work contexts is empirically tested in Chapter 10.

This chapter has described several mechanisms by which images of aging can affect individual development. Images of aging are themselves resources (e.g., sources of stress, comparison standards) and are also bundled together with other resources (motivational orientation, outcome expectancies, facilitative contextual resources) that affect the plasticity of adult development. Images of aging also affect the meaningfulness of action, which in turn

affect the actions people take as they navigate their lives and attempt to prevent losses and achieve their ideals. In sum, images of aging affect development via behavioral, psychological, and physiological (Levy, 2009) but also external contextual pathways and can be considered important components—as well as determinants—of individuals' developmental reserve capacity and thus the plasticity of adult development.

Having made a case for the importance of images of aging as components and determinants of individuals' developmental reserve capacity, I now move on to empirical investigations of the relationship of images of aging in the work context and two of the mechanisms discussed in this chapter. Specifically, I investigate the relationship between images of aging and (a) working adults' motivational orientation (Chapter 9) and (b) their intentions to stay in their current work context (Chapter 10), as one example of the external contextual pathway by which images of aging affect the plasticity of development. In the next chapter, I discuss the sample, data collection procedure and operationalization of images of aging in the work context.

Chapter 7

Empirical Investigations of Images of Aging in the Work Context: Sample, Procedure, Measures

The work context is one of the major developmental contexts of adulthood, at least within the Western world. Given the importance of images of aging as a component of an individual's baseline as well as developmental reserve capacity, combined with the centrality of the work context in most adults' lives, it seems particularly important to investigate the connection between images of aging within the work context and developmental outcomes. Features of the work context have been associated with personality and cognitive development across adulthood (see Bowen et al., in press for a review). It seems likely that the images of aging in the work context also influence adult development. To the best of my knowledge, there has been no empirical research that has investigated images of aging in the work context with regards to their relationship with adult development. Images of aging in the work context are also interesting from an organizational and societal perspective. For instance, it is widely assumed that (negative) beliefs about older workers are a boundary to the aims of organizations and society to increase the productivity of an aging workforce, (Eurolink Age, 2000; OECD, 2006), for instance, as an explanatory factor behind the low participation rates of older workers in further training and developmental activities (Maurer et al., 2003), as well as the relatively low participation rates of older adults in the workforce due to biased hiring and firing rates (OECD, 2006). Despite these widespread assumptions, to date there has been relatively little *empirical* evidence directly linking age-related beliefs, including beliefs about older workers, with work-related outcomes.

In sum, to date there has been little empirical evidence that has linked images of aging in the work context with either adult developmental outcomes or organizationally-relevant outcomes. To help address this gap in the literature, we conducted a series of empirical investigations of images of aging in the work context. In this chapter, I describe the sample, the data collection procedure and the demographic and images of aging measures

used as the basis for a series of empirical investigations on images of aging in the work context.

Sample

Data was collected in Fall 2008 and Spring 2009 from two companies in northern Germany. The two companies were recruited to participate in a multidisciplinary project concerning organizational preparedness for demographic change in exchange for company-specific feedback. The sample can be considered an organizational convenience sample. One company (Company A) manufactures components for the automobile industry with assembly line-style production. The other company (Company B) manufactures scientific and industrial weighing equipment (no assembly line). In total, 337 employees representing 36 work teams and 32 supervisors completed the questionnaire. In each company, both manual (blue-collar) and office (white-collar) employees participated in the study. The level of education was roughly equivalent in both companies (mode educational level: middle secondary certificate 'Realschulabschluss/Mittlere Reife'). Table 1 provides an overview of the two companies.

Table 1. Description of the two companies in the current sample.

Company	Product	Size (Number of Employees)	Sample Characteristics			
			Sample Size	Mean Age (SD)	% Female	% Manual
A	Components for the automobile industry (assembly-line)	3980; 1400 at survey location	$N_E = 162$, $N_S = 14$, $k = 14$	35.3 (8.6)	28.1%	44.4%
B	Scientific and industrial weighing equipment (no assembly line)	4600	$N_E = 175$, $N_S = 18$, $k = 22$	44.0 (10.6)	27.0%	39.5%

Notes. N_E = number of employees. N_S = Number of supervisors. k = Number of teams.

A collapsed sample was used in the analyses that follow in Chapters 8 through 10. In the collapsed sample, employee age ranged from 19 to 64 years with a mean age of 39.4 years ($SD = 10.53$). 37.6% of the sample indicated having a manual job and 57.7% indicated having an office job (4.7% missing). Employees had been with the company an average of 9.7 years ($SD = 9.78$). With regards to the highest level of education attained, 2.0% of the participants indicated having not attained a secondary education certificate, 16.8% a lower secondary certificate (*Volksschulabschluss/Hauptschulabschluss*), 33.9% a middle secondary certificate (*Realschulabschluss/Mittlere Reife*), 13.1% an upper secondary certificate and 33.6% of the participants had a tertiary degree. Just over one quarter of the participants (27.1%) were women. 13.8% of the sample indicated a birth country other than Germany. Team size ranged from 3 to 19 employees. Most teams consisted of between 5 and 10 employees (21 teams; 66%). 10 teams (31%) consisted of ten or more employees. 1 team (3%) consisted of 3 employees.

Procedure

Employees completed a paper-and-pencil questionnaire together with other members of their work team. Data collection took about 45 minutes to one hour. In addition, the direct supervisor of the work team completed a similar questionnaire in a separate room (30 minutes).

Measures

All measures were presented in German.

Demographic variables

Employees reported their year of birth, sex, highest level of education achieved (5 categories; see above), and the number of years they had worked in the company (tenure).

Images of aging measures

Older worker meta-stereotypes in the work context. Older worker meta-stereotypes_{WC} were measured with an adapted version of the PACS (Noack et al., 2009). Employees indicated the extent to which older workers (>45) within their work team are seen as *cooperative, reliable, loyal, prepared to learn, productive, creative, risk-taking, competent, flexible, and goal-oriented* (Cronbach's $\alpha = 0.90$). Answers could range from 1 'disagree' to 4 'agree'. Answers to the ten items were averaged (range: 1.3 – 4, $M = 2.89$, $SD = 0.50$). To ensure that the PACS captured meta-stereotypes unique for *older* workers, respondents also completed the same scale with regards to their meta-stereotypes of *younger* workers in the work context (younger worker meta-stereotypes_{WC}) for use as a statistical control (Cronbach's $\alpha = 0.88$). The two scales were substantially separated in the questionnaire to avoid direct contrast effects.

Aging self-perceptions. We used seven items from Wurm and colleagues (Wurm et al., 2007) with two additional items from the German Aging Study (Tesch-Römer, Wurm, Hoff, & Engstler, 2002) to assess individuals' aging self-perceptions. Participants indicated to what extent an item reflected their expectations for their own cognitive, physical and social development as they age (Cronbach's $\alpha = 0.66$ for employees and 0.73 for supervisors). An example item was, "To me, aging means that I am still able to learn new things." Answers could range from 1 'disagree' to 4 'agree'. We averaged responses to all nine items to form a global measure of aging self-perceptions (range: 1.89 – 4.0, $M = 3.0$, $SD = 0.38$).

Both measures can be found in Appendix A.

The data collected from the sample described in this chapter provide the basis for the three empirical investigations covered in Chapters 8, 9 and 10.

Chapter 8

Older Worker Meta-Stereotypes in the Empirical Sample

This dissertation allowed further exploration and validation of the PACS for measuring older worker meta-stereotypes specific to the organization or working group. In the current chapter, I discuss the statistical properties with regards to the internal and discriminant validity of the PACS as well as the extent to which older worker meta-stereotypes_{WC} are shared amongst members of the same work team and if there are company differences. I briefly discuss the results and offer some suggestions for future research on older worker meta-stereotypes_{WC} and PACS.

Validity of the PACS

Internal validity

Respondents in the current sample completed an eleven-item scale (see Appendix A). Exploratory factor analysis (principal components, unrotated) revealed that the items loaded onto one factor (range of loadings: 0.60 – 0.81; average loading = 0.72) with the exception of one item ('security/safety-oriented'), which loaded onto a second factor. Based on this result and the results of ongoing analysis of data from a larger pool of companies, we excluded this item for the remainder of the analyses. All further references to older worker meta-stereotypes_{WC} and PACS refer to the ten-item scale. Internal reliability on the ten-item scale was high (Cronbach's $\alpha = 0.90$).

Discriminant validity

Older worker meta-stereotypes_{WC} were not correlated with younger worker meta-stereotypes_{WC} ($r = 0.07$, $p = 0.23$). This deviates somewhat from previous research which found that older worker meta-stereotypes_{WC} were somewhat positively correlated with younger worker meta-stereotypes_{WC} ($r = 0.27$) (Noack, Bowen et al., 2010). However, the correlation in the study by Noack and colleagues refers only to the correlation between older

worker meta-stereotypes_{WC} and younger worker meta-stereotypes_{WC} among employees over 40 years old, which may explain the slight difference in results. Interestingly, in the current sample, with increasing age, employees reported more positive older worker meta-stereotypes_{WC} but less positive younger worker meta-stereotypes_{WC} (standardized beta weights for the effect of age controlled for company: 0.26 and -0.27, for older and younger worker meta-stereotypes_{WC}; both $p < 0.001$) (see next section). After partialing out age, the correlation between older worker meta-stereotypes_{WC} and younger worker meta-stereotypes_{WC} was significant, though low ($r = 0.13$, $p = 0.04$), in line with the results from Noack and colleagues (2010). The low correlation suggests that the PACS measures specifically older worker meta-stereotypes_{WC} and not just meta-perceptions of employees in general.

To further support the discriminant construct validity of older worker meta-stereotypes_{WC}, we also tested whether older worker meta-stereotypes_{WC} were distinct from individuals' aging self-perceptions. Employees may project their own aging self-perceptions onto the older worker meta-stereotypes_{WC} measure (i.e., externalization, see Chapter 2). Indeed, black employees' racial identity predicted their perception of the racial climate in their company such that those who more strongly identified with 'white' culture tended to view the racial climate more favorably (Watts & Carter, 1991). Analysis indicated a rather low, positive correlation between individuals' older worker meta-stereotypes_{WC} and their aging self-perceptions ($r = 0.22$, $p < 0.00$), suggesting that older worker meta-stereotypes_{WC} and employees' aging self-perceptions are related, but distinct variables. Because older adults may be more aware of the 'true' image of older workers in the working group due to the increased self-relevance of the older worker identity, age may moderate the degree to which aging self-perceptions correlate with older worker meta-stereotypes_{WC}. Partialing out the effect of age, however, did not affect the correlation between older worker meta-stereotypes_{WC} and aging self-perceptions ($r = 0.23$, $p < 0.00$).

In addition, we conducted a confirmatory factor analysis to check whether the older worker meta-stereotypes_{WC}, younger worker meta-stereotypes_{WC}, and aging self-perceptions

items loaded onto three distinct factors. We used LISREL 8.80 maximum likelihood estimation with list-wise deletion to conduct the analysis (Jöreskog & Sörbom, 2006). On the basis of previous research which found that older worker meta-stereotypes_{WC} correlated with younger worker meta-stereotypes_{WC} (Noack, Bowen et al., 2010) and the current correlation analysis which indicated that older worker meta-stereotypes_{WC} were correlated with aging self-perceptions, we hypothesized that a three factor solution with the older worker meta-stereotypes_{WC} factor correlated with younger worker meta-stereotypes_{WC} factor as well as the aging self-perceptions factor would be the best solution. The chi-square was 877.44 ($df = 375$; $p < 0.001$). A chi-square value that is two to three times the degrees of freedom is considered an acceptable fit (McIver & Carmines, 1981). The root mean square error of approximation (RMSEA) was 0.08, the minimum acceptable level (Price & Mueller, 1986). The fit indices for the non-normed fit index (NNFI), incremental fit index (IFI) and comparative fit index (CFI) were within close range of the .95 criterion suggested by Hu and Bentler (1999). In addition, the parsimony goodness of fit index (PGFI) was 0.68, above the acceptable level of .50 (Byrne, 1998). All of the path loadings were significant ($p < .05$), with standardized item loadings ranging from 0.22 to 0.56, with the exception of one item on the aging self-perceptions scale which had a rather low loading (0.04). (This item was retained in the aging self-perceptions scale to maintain the desired heterogeneity of the scale.) The correlation between older worker meta-stereotypes_{WC} and younger worker meta-stereotypes_{WC} was 0.05 and the correlation between PACS and the aging self-perceptions scale was 0.24. As displayed in Table 2, this model had significantly better fit than the single factor solution and slightly better fit than the three factor solution with all factors uncorrelated.

Table 2. Results of the confirmatory factor analyses.

	RMSEA	NNFI	IFI	CFI	PGFI	χ^2	df	χ^2_{diff}	df _{diff}
1-Factor	0.19	0.68	0.71	0.70	0.43	2096.17	377	-	-
3-Factor, Uncorrelated	0.08	0.91	0.91	0.91	0.68	887.56	377	1208.61	0
3-factor, OWMS _{WC} Correlated with ASP and YWMS _{WC}	0.08	0.91	0.91	0.91	0.68	877.44	375	10.12	2

Notes. OWMS_{WC} = older worker meta-stereotypes in the work context; ASP = aging self perceptions, YWMS_{WC} = younger worker meta-stereotypes in the work context. Both χ^2_{diff} scores are significant at the $p < .01$ level.

Work-team and Organizational Age Climates

As discussed in Chapter 2, stereotypes tend to be shared amongst social collectives. We therefore explored the extent to which employees within work teams (employees who work together under a common supervisor) shared similar older worker meta-stereotypes_{WC}. Although we did not have enough companies in the current sample to test the extent to which employees within companies shared similar older worker meta-stereotypes_{WC}, we did check for company differences and compared the company-level aggregates with company-level data gathered in other studies.

Work-team age climate?

Based on agreement within both the organizational culture and organizational climate literatures that the psychological environments within organizations can vary substantially (e.g., Schein, 2004 and Schneider, 1975, respectively), in the current work we explored the possibility that work teams may each have their own *age climates*, that is, a *shared* image of older workers. A multilevel approach to climate recognizes that employees are confronted

with a multitude of climate “signals” from sources at different levels of their environment (Zohar & Luria, 2005). For example, supervisors at the group-level may differentially implement organizational-level policies, leading to different group-climates within a single organization. Indeed, studies of organizational climate have demonstrated evidence of distinct group-level climates (e.g., innovation, Anderson, & West, 1998; safety climate, Zohar, 2000; Zohar & Luria, 2005). With regards to age climate (i.e., shared perceptions of the image of older workers), a number of variables on the team level could potentially affect the work team age climate. For instance, supervisors’ aging self-perceptions may influence the degree to which they implement the organizational-level practices and policies assumed to be associated with age climate on the organizational level (cf. Noack & Staudinger, 2010).

To test the hypothesis that work teams have their own age climates, we adjusted the instructions of the PACS (Noack et al., 2009) to read ‘Older workers within my *working group* are seen as...’ (see Appendix A) and tested whether the age climate measure met the criteria for aggregation to the team level.

Criteria for aggregation. To justify aggregation of individual older worker meta-stereotypes_{WC} to the team level as a measure of work team age climate, there needs to be sufficient agreement within work teams with regards to the age climate. A variety of indicators can be used to check whether intra-group agreement is sufficient to justify aggregation. These indicators include the r_{wg} statistic (James, Demaree, & Wolf, 1993) and the average absolute deviation index AD_M (Burke & Dunlap, 2002; Burke, Finkelstein, & Dusig, 1999) as indicators of within-team agreement, and the intra-class correlation coefficients (Bartko, 1966, 1976) and one-way analysis of variance (to check for significant between-group differences; Rousseau, 1988) as indicators of group differences (i.e., discriminatory power).

The r_{wg} compares the observed group variance to an expected random variance, usually a uniform distribution. George (1990) suggested a cut-off criterion of 0.70. Although this statistic has been frequently used in the literature, comparison with an expected uniform distribution can be problematic (Biemann & Heidemeier, 2010). We would not, for instance,

expect the age climate ratings to be uniformly distributed. As is often the case (Bliese, 2000), respondents in the current sample tended to use only part of the answer scale. Answer bias and the assumption of a uniform distribution can lead to overestimates of within-team agreement. It is therefore especially important that aggregation decisions are not made on the basis of this indicator alone.

The AD_M statistic is the average deviation of group members' responses from the group mean. The average deviation is first calculated for each item of the scale. Then the average item deviations are averaged. Burke et al. (1999) suggested that the scale AD_M should not exceed the value of $A/6$, where A is the number of possible answers (e.g., Likert categories) per item. In the case of age climate, the cut-off value is 0.67 based on the four-category answer scale, or 0.50 for a more conservative estimate noting that most respondents only used the 3 more positive answer categories.

Intraclass correlation (ICC) is defined as the ratio of the true variance between groups and the total variance (e.g., Lüdtke, Trautwein, Kunter, & Baumert, 2006). Because we assume that our current sample is a random sample drawn from a pool of working groups as well as employees, we can only estimate the ICC. There are various estimates in the literature. Eta-squared is the proportion of between-group variance (sum of squares) compared with the total variance. James (1982) reported a median value of 0.12 for group-related variables (equating Eta-squared and ICC(1), see following). Problematically, this indicator tends to be quite inflated when group size is small (Bliese, 2000), as in our data set. The ICC(1) statistic essentially compares the between-group variance to the total amount of variance, while accounting for different number of respondents within groups. When ICC(1) is large, one team member's rating provides a relatively reliable estimate of the group mean. Bliese (2000) reported values between 0.05 and 0.20 as typical for the ICC(1). The ICC(2) offers an indication of the reliability of the group mean by comparing the difference between the mean square between and the mean square within as a proportion of the mean square between. Glick (1985) recommended a cut off of 0.60 for this indicator. Both the ICC(1) and ICC(2) should be sufficiently high in order to justify aggregation.

Finally, Hays (1981) suggested that the minimum criterion for aggregation should be an F ratio greater than 1, but a significant F -ratio might be more conclusive.

The various indicators of consensual validity for the work team age climate were calculated for both companies collapsed as well as for each company separately. As displayed in Table 3, the older worker meta-stereotype_{WC} / age climate measure met the minimum requirements for aggregation to the team level according to the ANOVA, r_{wg} and AD_M statistics and had a sizable Eta-squared value, but had relatively low values for the ICC(1) and ICC(2). Given the aforementioned problems with the r_{wg} , AD_M and Eta-squared statistics, the analysis did not reveal conclusive evidence of a work team age climate. However, we note that our sample, with only two companies (which potentially differ, cf. Noack & Staudinger, 2010) and only a limited number of teams per company, is hardly ideal for testing whether a work team age climate truly exists. In fact, there seems to be a difference between the two companies with regard to whether an age climate exists on the work-team level or not. While the results for company A were not suggestive of an age climate on the work-team level, the results for company B suggest the need for further investigation, possibly with a larger number of work teams: In company B, the ANOVA analysis is close to significant, the r_{wg} , AD_M and Eta-squared indicators are adequate and the ICC(1) is the lower boundary of consensual validity acceptable in climate research (Bliese, 2000). A three-level data set with a range of companies as well as work teams would be needed to more conclusively test for the existence of work team age climate, as various organizational conditions are thought to affect the extent of between-team variability (e.g., variables that limit supervisory discretion like strong organizational climate, high routinization of work and formalization; Zohar & Luria, 2005).

Table 3. Results of the analysis of age climate at the work-team level⁸.

Indicator	Criteria	Work-Team Age Climate ($k = 36$)	
		Company A ($k = 14$)	Company B ($k = 22$)
ANOVA	Significant between-group differences, $F > 1$	$F(35, 276) = 1.01$, $p = 0.33$	
		$F(13, 133) =$ $0.82, p = 0.64$	$F(21, 143) =$ $1.41, p = 0.125$
r_{wg}	> 0.70	0.94	
		0.85	0.94
AD_M	< 0.67 (4 answer categories) < 0.50 (3 answer categories)	0.48	
		0.49	0.48
Eta-squared	~ 0.12	0.12	
		0.07	0.17
ICC(1)	Between 0.05 and 0.20	0.01	
		-0.02	0.05
ICC(2)	0.60	0.09	
		-0.22	0.29

Notes. k = Number of teams.

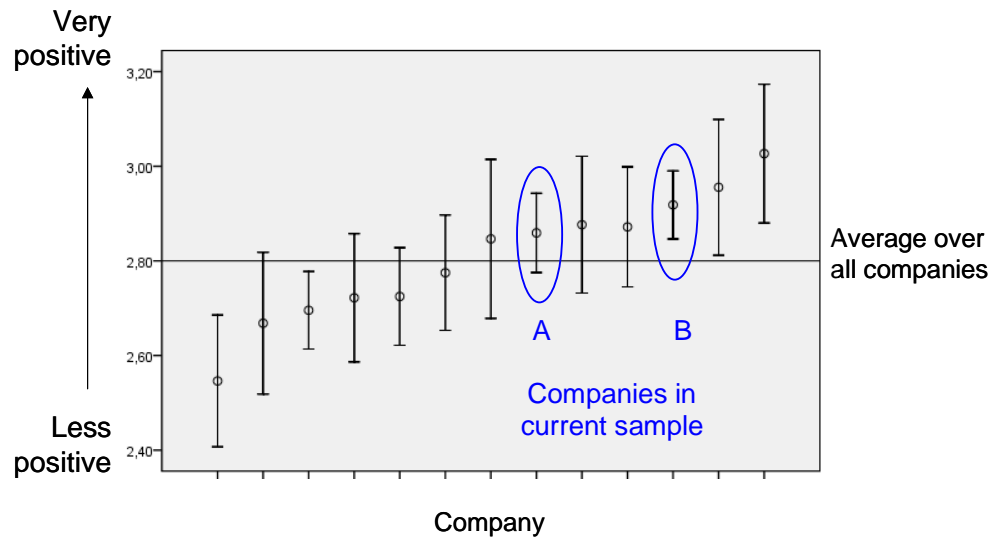
Company comparison

Noack and Staudinger (2010) reported that companies have different organizational age climates. In the current sample, the company-level aggregate of older worker meta-stereotypes_{WC} did not differ between the two companies, $F(1, 310) = 0.66$, $p = 0.42$. Using an adjusted scale such that the measurement between both samples was consistent, the company-level aggregate from the two companies in the current sample were compared with the organizational age climate data from Noack and colleagues (Noack & Staudinger, 2010).

⁸ Similar analyses were also conducted with the younger worker meta-stereotypes_{WC} scale. Analysis revealed that this measure also failed to meet the criteria for aggregation to the work-team level. The results of the within-team agreement analysis of the age climate for younger workers is available in Appendix B.

As displayed in Figure 4, both companies in the current sample had rather positive company-level aggregates.

Figure 4. Comparison of organizational age climates.



Notes. Sample size varied widely across companies; therefore, the standard deviation should not be taken as an indication of climate strength (cf. Schneider, Salvaggio, & Subirats, 2002).

Demographic Predictors of Older Worker Meta-Stereotypes

We explored whether older worker meta-stereotypes_{WC} varied as a function of employees' age, company tenure, sex, education and physicality of job. Although these analyses were highly exploratory (i.e., we were not testing a-priori hypotheses), we had some reason to believe that certain demographic variables might be related to older worker meta-stereotypes_{WC}. For instance, older employees or employees who have been with the company longer might have different experiences of age-related policies and practices in the company which may in turn affect their older worker meta-stereotypes_{WC}. Self-enhancement may also lead older employees to have more positive older worker meta-stereotypes_{WC}. Dissonance reduction amongst more highly committed employees (e.g., those with longer

tenure) or selection processes could result in a positive relationship between tenure and older worker meta-stereotypes_{WC}. For instance, those who perceive a negative image of older workers in the particular work context might be more inclined to leave the work context. Older worker meta-stereotypes_{WC} might vary as a function of sex due to the 'double standard of aging' whereby stereotypes about older women are thought to be more negative than stereotypes about older men (e.g., Sontag, 1979). Educational level has also been associated with aging-related beliefs (e.g., Compton, Bachman, Brand, & Avet, 2000; Lachman & Weaver, 1998). Furthermore, opportunities for older workers may vary by level of education, possibly leading to different older worker meta-stereotypes_{WC}. Finally, we wondered whether the particularly negative stereotypes with regards to physical capacities might affect older worker meta-stereotypes_{WC} for employees in jobs that demand more physical exertion. Previous research has suggested that organizational age climate may be more positive in organizations that demand a higher level of physical exertion, perhaps due to a selection effect whereby only particularly 'hardy' older employees are able to remain working in the company, leading to halo effects (Noack & Staudinger, 2010).

We analyzed the effects of these demographic variables in a two-level hierarchical regression model (employees nested in working teams) with random intercepts. The data were analyzed with HLM 6.06 software in order to account for the non-independence of the participants within the sample (Raudenbush, Bryk, & Congdon, 2004). To maximize power, missing values were imputed on all variables using the Expectation-Maximization (EM) algorithm. Monte Carlo studies have shown imputing missing values using the EM algorithm produces less biased results than either list-wise deletion (Graham & Donaldson, 1993; Malhotra, 1987; Muthén, Kaplan, & Hollis, 1987) or pair-wise deletion (Muthén et al., 1987). This procedure resulted in a final sample of 337 employees nested in 36 teams. We statistically controlled for aging self-perceptions and positive affect as a control for common method bias (Podaskoff, MacKenzie, Lee, & Podaskoff, 2003) because we were interested in older worker meta-stereotypes_{WC} separate from individual's aging self-perceptions and their general answer tendencies. We also controlled for company differences (dummy) on

the team level because we were interested in the individual-level predictors of older worker meta-stereotypes as opposed to team- or organizational-level predictors, and older worker meta-stereotypes_{WC} have been found to differ between companies (Noack & Staudinger, 2010).

Demographic variables were entered both on the individual as well as the team level as group aggregates to test for any possible contextual effects of the demographic variables (e.g., to compare the effects of individual age as well as team average age) (cf. Chan, 1998). Sex (female) and physicality of job (medium or high) were modeled as dummy variables.

As displayed in Table 4, older worker meta-stereotypes_{WC} were more positive with increasing individual age ($\beta = 0.01$, $p = 0.001$) and less positive with higher level of formal education ($\beta = -0.01$ $p = 0.008$). No other demographic variables reached significance either on the individual or team level (all $ps > 0.10$). Analysis also confirmed that there was no significant team variation with regards to older worker meta-stereotypes_{WC} ($p = 0.34$), in line with the conclusions with regards to work-team age climate previously described.

Table 4. Demographic predictors of older worker meta-stereotypes_{WC}.

Predictor		Beta Coefficients (SD)
Level 1		
	Age ^A	0.01 (0.003) ^{***}
	Tenure ^A	-0.01 (0.00) [†]
	Sex (Female)	-0.01(0.07)
	Education ^A	-0.08 (0.03) ^{**}
	Physicality of Job (Medium or High)	0.04 (0.07)
Controls	Aging Self-Perceptions	0.23 (0.07) ^{***}
	Positive Affect	0.15 (0.05) ^{***}
Level 2		
	Company (dummy)	-0.13 (0.10)
	Team Mean Age ^B	0.00 (0.01)
	Team Mean Tenure ^B	0.01 (0.01)
	Proportion Women on Team	-0.11 (0.13)
	Team Mean Education ^B	-0.00 (0.05)

Notes. ^AVariable has been centered around its group mean. ^B Variable has been centered around its grand mean. [†] $p \leq 0.10$, ^{**} $p \leq 0.01$, ^{***} $p \leq 0.001$.

Discussion

Analysis of the PACS indicated high internal validity and supported previous research regarding the discriminant validity of the older worker meta-stereotypes_{WC} construct. Older worker meta-stereotypes_{WC} were distinct from younger worker meta-stereotypes_{WC}, supporting the contention that the PACS measures specifically the meta-stereotypes about older workers as opposed to general meta-perceptions of the social environment. Furthermore, older worker meta-stereotypes_{WC} were distinct from individuals' aging self-perceptions, indicating that older worker meta-stereotypes_{WC} are more than just individuals' projections of their own aging self-perceptions.

We did not find conclusive evidence of distinct age climates at the work-team level. However, we emphasize the exploratory nature of this analysis and the need for further research with a larger sample of companies and working groups. The overall positive organizational age climates in both of the companies in the current sample may result in underestimations of the 'true' effects of older worker meta-stereotypes_{WC} in the analyses that follow as the range is restricted to overall rather positive older worker meta-stereotypes_{WC} (i.e., there may be a floor or ceiling effect).

There was no evidence that sex, company tenure or the physicality of work were related to older worker meta-stereotypes_{WC}. Furthermore, there was no evidence that older worker meta-stereotypes_{WC} varied as a function of team average age, tenure or education or the proportion of women on the team. However, our results suggested that there was a positive relationship between age and older worker meta-stereotypes_{WC}, as well as a negative relationship between education and older worker meta-stereotypes_{WC}. These relationships warrant future research. To some extent, the positive relationship between age and older worker meta-stereotypes_{WC} stands in contrast to other meta-stereotype research which has found that in-group members (e.g., older workers) tend to overestimate the negativity of how they are perceived (e.g., Sigelman & Tuch, 1997). The contrast between the current results and other meta-stereotype research may be because of a methodological difference, as other meta-stereotype research has typically accessed the in-group's meta-stereotypes of an out-group (e.g., what white people think black people think about them, what older people think younger people think about them), where as the PACS measures how members of the whole organization (of which the employee him or herself is a member) perceive older workers. Alternatively, the contrasting results might be because boundaries between age groups (including 'in' and 'out' age groups) are less clear or because group identification processes play less of a role with regards to images of aging (cf. Hummert et al., 1994).

The age trend may also reflect differential access to the kinds of information that contribute to older worker meta-stereotypes_{WC}. For example, organizational members may

avoid making derogatory comments about older workers when older colleagues are present, but may speak more freely amongst younger workers. More positively, older workers may have greater personal knowledge about company policies and practices with regards to older workers and that the actual experience of being an older worker within a company is more positive than what younger workers expect. Another possibility is that the age trend may reflect a positive selection process, whereby only those older adults who believe that they are appreciated stay with the company. Finally, the positive relationship between age and older worker meta-stereotypes_{WC} may reflect a process of self-concept immunization (Brandstädter & Greve, 1994), whereby older workers reduce the dissonance between their continuing employment and a less than flattering image of older workers in the work context by changing their perceptions of the work context and attributing more appreciative meta-stereotypes to the company.

The negative relationship between education and older worker meta-stereotypes_{WC} is particularly interesting against the backdrop of previous research which has shown that higher education is associated with more *positive* aging-related control beliefs (e.g., Compton et al., 2000) and aging-related expectations (e.g., Lachman & Weaver, 1998). Possibly, the negative relationship between education and older worker meta-stereotypes_{WC} suggests that highly educated employees perceive a disjoint between their own images of aging, including their expectations for their own aging, and the images of aging and opportunities within the work context.

Additional limitations and suggestions for future research

In the current research we were unable to test whether individuals' older worker meta-stereotypes_{WC} were distinct from their perceptions of a more general diversity climate (e.g., Kossek & Zonia, 1993). Future research should address the extent to which it is helpful to measure and investigate older worker meta-stereotypes_{WC} as opposed to individuals' perceptions of how members of the company appreciate diversity in general (including factors such as sex, race, educational background as well as age). In addition, future

research may wish to explore whether individuals' older worker meta-stereotypes_{WC} differ from their age meta-stereotypes in other contexts. For instance, do people distinguish between age meta-stereotypes in their work context and *general* age meta-stereotypes (i.e., what they think most other people think about aging and older workers/old age)?

Finally, there are a few limitations concerning the operationalization of older worker meta-stereotypes_{WC}. The PACS asks individuals to rate how older workers *as a single group* are seen. However, other age stereotype research has revealed that people do not have a single representation for the category "older adult" (Hess, 2006). Rather, people's age representations consist of several subcategories (e.g., Brewer et al., 1981; Brewer & Lui, 1984). It is unknown whether this also applies to older workers, that is, whether people's representations of older workers also consist of several subcategories (e.g., cruising towards retirement, workaholic). The current operationalization of older worker meta-stereotypes_{WC} defined an older worker as above 45 years old. There may also be, for instance, substantial differences between older worker meta-stereotypes_{WC} with regards to workers aged 45 to 55 (e.g., more positive) and over 55 (less positive). Defining older workers in this way may have positively biased reports of older worker meta-stereotypes_{WC}.

This chapter has offered a brief, exploratory glance at the older worker meta-stereotypes_{WC} construct and operationalization. Importantly, this chapter provided evidence of the validity of the PACS measure as well as some interesting insights with regards to predictors of older worker meta-stereotypes_{WC}, including team and company membership as well as demographic variables. In Chapters 9 and 10, we use the PACS measure of older worker meta-stereotypes_{WC} to investigate how older worker meta-stereotypes_{WC} moderate the relationship between age and promotion regulatory focus (Chapter 9) as well as how older worker meta-stereotypes_{WC} are related to employees' turnover intentions (Chapter 10). Thus, we relate images of aging in the work context back to two of the processes by which images of aging translate into developmental trajectories, specifically, by affecting individuals' motivational orientation as well as selection processes to contexts differentially facilitative of positive development.

Chapter 9

Images of Aging Are Related to Working Adults' Promotion Regulatory Focus⁹

Changing requirements in the work context are making it more important than ever for working age adults to have and maintain a motivational focus oriented towards growth and achieving new gains. For instance, working adults are increasingly being called upon to continue to learn new skills as well as master new tasks and jobs over the course of longer careers (Maurer, 2001). The motivation and efforts to attain goals—such as the growth-goals of learning new skills and mastering new tasks—are maximized when there is a match between the goal and the individual's motivational orientation (Higgins, 2000; Spiegel, Grant-Pillow, & Higgins, 2004). *Regulatory Focus Theory* distinguishes between two motivational orientations: promotion focus, the self-regulatory focus concerned with approaching positive outcomes and associated with advancement, aspirations, and accomplishments; and prevention focus, the self-regulatory focus concerned with avoiding negative outcomes and associated with vigilance, safety, and responsibilities (Higgins, 1997, 1998). According to this framework, the achievement of growth-goals within the work-context is dependent in part on the strength of working adults' promotion focus. Indeed, promotion focus is associated with approach (as opposed to avoidance) tendencies (e.g., Higgins, Roney, Crowe, & Hymes, 1994; Higgins, Shah, Friedman, 1997; Higgins & Tykocinski, 1992; Seibt & Förster, 2004). Furthermore, promotion focus is associated with creative performance (e.g., Crowe & Higgins, 1997; Friedman & Förster, 2001), which may be important in certain job contexts. Maintaining a strong promotion focus is also important with regards to adult development. With increasing age, the acquisition of new developmental resources becomes more difficult with the accumulation of age-related losses. Therefore, the amount of resources

⁹ This chapter is a pre-print of an article submitted to a journal of the American Psychological Association for publication.

accumulated at earlier points in the life span (and their management in later life) is crucial for successful aging (Freund, 2008).

In this chapter, we empirically investigate the relationship between images of aging and promotion focus amongst working age adults. Motivational orientation and the kinds of goals people pursue are dependent upon various factors such as time perspective (e.g., Ebner, Freund, & Baltes, 2006; Trope & Liberman, 2000), the expected likelihood of success (e.g., Brandtstädter, 1998; Idson, Liberman, & Higgins, 2000), and the salience of negative or positive outcomes (Seibt & Förster, 2004). As we will elaborate, images of aging—an umbrella term which refers to mental associations with age and the aging process—are related to the aforementioned resources that support promotion focus. Thus, our general hypothesis is that positive images of aging should be associated with higher promotion focus.

Images of Aging as Resources for Promotion Focus

In the current research, we focused on the relationship between working adults' promotion focus and two measures of images of aging: *aging self-perceptions* and *older worker meta-stereotypes*.

Aging self-perceptions and promotion focus

Aging self-perceptions refer to how individuals perceive their own aging process, including already lived experiences and also generalized expectations with regards to aging in the future (Steverink et al., 2001). In other words, aging self-perceptions reflect an individual's perceptions of both the *state of* and *prospects for* personal development. In turn, it can be expected that aging self-perceptions affect processes of self-regulation (Brandtstädter & Rothermund, 2002), such as promotion focus. Why is that? As discussed in Chapter 6, aging self-perceptions are linked with other components of an individual's developmental reserve capacity, including the perceptions of opportunity for gains, time perspective and the expected likelihood of success (see also Wurm et al., 2007) which are all related to promotion focus.

Aging self-perceptions reflect estimations for the *opportunity* for gains in one's own future. The salience of potential positive outcomes introduces a positive anchor point and should thus support promotion focus (cf. Seibt & Förster, 2004). Aging self-perceptions also reflect expectancies for future resource changes and thus likely affect how 'protective' people are of their current resources. Feeling that time and other resources for correcting potential 'mistakes' are slipping away may make decisions feel more consequential, leading to feelings of insecurity and a more risk-averse style of resource investment (Freund & Ritter, 2009). People with negative aging self-perceptions expect that their resources will decrease in the near future, and thus seem less likely to expend resources in what might be perceived as the 'risky' endeavor of investing in possible gains.

Aging self-perceptions can also be considered aging/developmental domain-specific control beliefs, with more positive aging self-perceptions reflecting more control over future strivings (Wurm et al., 2007). People harboring strong self-perceptions of self-efficacy and control are usually more likely to accept demanding and challenging tasks as well as have an optimistic outlook towards future development (Brandstädter & Rothermund, 2002). In turn, actual or anticipated success results in an increase in promotion focus and a decrease in prevention focus, whereas actual or anticipated failure results in an increase in prevention focus and decrease in promotion focus (Idson et al., 2000).

Finally, positive aging self-perceptions are associated with a more extended future time perspective whereas the negative aging self-perceptions may reflect a more limited time perspective (Wurm et al., 2007). Investing in potential gains makes more sense when one expects to have time to 'reap the benefits'. Indeed, promotion focus tends to dominate when time is seen as expansive (Pennington & Roese, 2003). Negative aging self-perceptions may create a situation in which the costs of investing in growth-goals may outweigh the potential benefit of a future gain, given that one perceives time constraints.

In sum, aging self-perceptions are related to the salience of positive or negative outcomes and lend meaning to investing in growth-related endeavors through their associations with feelings of control, optimistic expectations, and time perspective. Positive

outcomes are more salient and investing in growth makes more sense for people with more positive aging self-perceptions. Thus, more positive aging self-perceptions should be associated with higher promotion focus. This should be true for employees of all ages, because aging self-perceptions are not specific to any particular age group.

Older worker meta-stereotypes and promotion focus

In addition to aging self-perceptions, another resource that we think is related to working adults' promotion focus is how they think older workers are perceived within their current work context (i.e., their older worker meta-stereotype specific to their working group). Like aging self-perceptions, older worker meta-stereotypes_{WC} are related to the salience of possible gains within the work context as well as other resources for achieving gains.

Positive older worker meta-stereotypes_{WC} reflect perceptions that the potential for growth irrespective of age is recognized within the current work context. Thus, within a given work context, older worker meta-stereotypes_{WC} should be related to perceptions of current and/or future opportunities for gains and growth (e.g., training, salary increases, promotion, more fulfilling tasks, social status), as well as the likelihood that his or her growth-oriented efforts will be supported by the current work context. The potential for future gains within the work context are thus more salient for people with more positive older worker meta-stereotypes_{WC}, creating a more positive anchor point which should thus support promotion focus (cf. Seibt & Förster, 2004). In addition, positive older worker meta-stereotypes_{WC} are also related to perceptions that one will continue to have access to the resources that support the achievement of growth goals. Subjective expectancies related to accessibility of resources that can be used to influence development contribute to self-regulation (Brandstädter & Rothermund, 2002). More positive older worker meta-stereotypes_{WC} may well be associated with a longer future time perspective with regards to one's current work role. The extent to which one perceives that the organization and/or work group recognizes the assets of older workers is likely related to the feeling that one will be able to continue a

long career in the current context as opposed to being ‘pushed out’ after reaching a certain age.

In sum, it seems likely that older worker meta-stereotypes_{WC} are related to the salience of opportunities for growth in the work context, perceptions of the extent to which the current work context will support growth-related efforts regardless of age, as well as future time perspective with regards to the current work role. Given the importance of the work context for working adults, we expect that salience of opportunities for growth in the work context, perceptions of the extent to which the current work context will support growth-related efforts, as well as future time perspective with regards to the current work role will ‘spill over’ to affect working adults’ general (as opposed to work domain-specific) promotion focus (cf. Hogan & Roberts, 2004; Roberts, Wood, & Smith, 2005; Schooler, Mulatu, & Oates, 2004). Thus, more positive older worker meta-stereotypes_{WC} should be associated with higher promotion focus.

The relationship between older worker meta-stereotypes_{WC} and promotion focus should be stronger with increasing age as one gets closer to the stereotyped group (older workers). With increasing age, older worker meta-stereotypes_{WC} increasingly describe *current* and *near future* opportunities and resources for growth as leaving one’s current job becomes less likely (e.g., Griffeth, Horn, & Gaertner, 2000). We therefore hypothesized that age, as a measure of self-relevance, would moderate the relationship between older worker meta-stereotypes_{WC} and promotion focus. In addition, *exposure* to a particular image of older worker might, over time, moderate the relationship between older worker meta-stereotypes_{WC} and promotion focus, such that the image of older workers in a particular work context is likely to have more of an effect on the people who have spent more time in that context. Therefore we also explored whether tenure, in addition to age, moderated the relationship between older worker meta-stereotypes_{WC} and promotion focus.

Current study

To sum up, we had two hypotheses with regards to the relationship between images of aging and promotion focus¹⁰. First, we expected that more positive aging self-perceptions would be related to higher promotion focus. Because aging self-perceptions are not specific to any particular age, we did not expect age to moderate the relationship between aging self-perceptions and promotion focus. Second, we expected that more positive older worker meta-stereotypes_{WC} would also be associated with higher promotion focus. Because older worker meta-stereotypes become more relevant with increasing age, we expected that age would moderate the relationship between older worker meta-stereotypes and promotion focus. We also explored whether tenure, as a proxy of exposure to a particular image of older workers, moderated the relationship between older worker meta-stereotypes and promotion focus.

Method

The sample, data collection procedure and the images of aging measures (older worker meta-stereotypes_{WC}, aging self-perceptions) were described in Chapter 7. Only those measures not already described will be mentioned here.

Control variables

In line with other research on regulatory focus (e.g., Higgins et al., 2001), we statistically controlled for prevention focus. This allowed us to focus on predictors of promotion focus specifically as opposed to a general strength of self-regulation. We also statistically controlled for gender and education, as promotion focus is thought to be associated with early socialization experiences (Higgins, 1997) which might potentially differ

¹⁰ In the current study we were only interested in promotion focus as a dependent variable. It is specifically the age-related decrease in promotion orientation that is problematic within the work context, whereas an increase in prevention orientation is not (we will address this latter point in the discussion). Furthermore, we would not expect our measure of older worker meta-stereotypes to predict prevention focus, as our measure is uni-dimensionally positive (more or less positive). We would expect, as previous research has shown, that prevention focus would be associated with measures of the *negativity* of older worker meta-stereotypes (Seibt & Förster, 2004).

between men and women and members of different social classes (for which education is a proxy). We also statistically controlled for a measure of positive affect to control for common method bias (Podaskoff et al., 2003)¹¹. Finally, we controlled for younger worker meta-stereotypes_{WC} to increase confidence that any potential relationships between older worker meta-stereotypes_{WC} and promotion focus were specific to older worker meta-stereotypes_{WC} and not just general perceptions of the social environment within the work team.

Measures

Promotion focus. Promotion focus was measured with a German translation of the two-item scale from Cunningham, Raye and Johnson (2005). The original items are: *I focus on opportunities that will enhance my life; I am primarily motivated by seeking potential successes*. Despite using only two items, this measure proved at least as valid as other available measures in a comparative assessment (Farb & Cunningham, 2005; as cited in Cunningham et al., 2005). Respondents indicated their agreement on a four-point Likert scale ranging from 1 'strongly disagree' to 4 'strongly agree'. Responses to the two items were averaged to form a scale of promotion focus (Cronbach's $\alpha = 0.42$).

Prevention orientation. We used a two-item measure of prevention focus as a control variable (Cunningham et al., 2005; same answer format as the promotion scale). The two prevention focus items were: *I focus on ensuring that I will avoid potential mishaps or negative events* and *I am primarily motivated by avoiding failure*. Respondents indicated their agreement on a four-point Likert scale ranging from 1 'strongly disagree' to 4 'strongly agree'. Responses to the two items were averaged to form a scale of prevention orientation (Cronbach's $\alpha = 0.74$).

¹¹Relative to negative affect, positive affect is a more appropriate control for single source bias because the PACS and the promotion orientation scale are both 'positive' measures (positivity of older worker meta-stereotype and orientation towards positive outcomes, respectively). Still, we also checked the possible confounding effects of respondents' negative affect by using an average of the ten negative emotion items of the PANAS. Including negative affect in a separate analysis did not affect the results.

Positive affect. Employees used an adapted PANAS scale to report the frequency with which they had experienced ten positive emotions (e.g. enthusiastic, relaxed; Kessler & Staudinger, 2009) at the workplace over the last few weeks. Answers could range from 1 'never' to 5 'very often'. Answers to the ten positive emotion items were averaged to form a measure of positive affect (Cronbach's $\alpha = 0.83$).

Table 5 displays the correlations between the variables on the employee level.

Table 5. Intervariable correlations (level 1).

	1	2	3	4	5	6	7	8	9
1 Age	-								
2 Tenure	.67**	-							
3 Education	-.01	-.16**	-						
4 Sex	-.10	-.12*	-.04	-					
5 Prevention	-.20**	-.20**	-.24**	-0.2	-				
6 Pos. Affect	.13*	.13*	-.00	.00	-.08	-			
7 ASP	.05	.00	.12*	.03	-.08	.20**	-		
8 YWMS _{WC}	-.22**	-.12*	.14**	.00	.01	.13*	.00	-	
9 OWMS _{WC}	.23**	.14**	-.12*	-.04	.03	.24**	.21**	.06	-
10 Promotion	-.16**	-.16**	-.04	.07	.22**	.09	.22**	.10	.08

Notes. Pos. Affect = Positive affect, ASP = Aging self-perceptions, YWMS_{WC} = younger worker meta-stereotypes in the work context, OWMS_{WC} = older worker meta-stereotypes in the work context. * $p \leq 0.05$; ** $p \leq 0.01$.

Data analysis strategy

Missing data. To preserve power, missing values on all items were imputed using the Expectation-Maximization (EM) algorithm. Monte Carlo studies have shown imputing missing values using the EM algorithm produces less biased results than either list-wise deletion

(Graham & Donaldson, 1993; Malhotra, 1987; Muthén et al., 1987) or pair-wise deletion (Muthén et al., 1987). The maximum percentage of missing values across all of the variables was 9.8% (younger worker meta-stereotypes_{WC}) and 7.4% for older worker meta-stereotypes_{WC}. All other variables had 1.8% or fewer missing responses. This procedure resulted in a final sample of 337 employees nested in 36 teams.

Statistical analysis. Given the multi-level data structure with employees nested in working teams and two companies, the data were analyzed with HLM 6.06 software in order to account for the non-independence of the participants within the sample (Raudenbush et al., 2004). Company differences were statistically controlled with a dummy variable on the team level. A two-sided significance level of $p = 0.05$ was used to determine the statistical significance of the coefficients. The empty model with random intercepts was checked for any significant differences between work teams. The random intercept term was not significant ($p > 0.50$), meaning that there were no differences in promotion focus between teams. Thus, all analyses were conducted using fixed intercepts and slopes.

Terms were entered in three sets. First, we entered prevention orientation on the individual level as well as the demographic variables (age, sex, education, tenure) on both the individual and work-team level (e.g., team average age, proportion of women in team) to separate individual from contextual effects (cf. Chan, 1998). To avoid collinearity problems, we added tenure on both levels as an intermediary step without age in the model (Model 1b) and then with age in the model (Model 1c). Since there were no problems with model convergence when both age and tenure were included in the model, we retained both age and tenure in the following steps. Next, we entered the images of aging variables (i.e., older workers meta-stereotypes_{WC}, aging self-perceptions and younger worker meta-stereotypes_{WC} as a control) as well as positive affect to partially control for single-source bias.¹² In order to test the hypothesis that age would moderate the relationship between older worker meta-

¹² Analysis did not support the existence of a meaningful team level age climate for either older or younger workers (see Chapter 8). We therefore did not include the team level aggregates in the current model. Including team level age climate for older and/or younger workers in a separate analysis did not affect the results.

stereotypes_{WC} and promotion focus, we calculated an older worker meta-stereotypes_{WC} by age interaction term as well as age interaction terms for the other image of aging variables (aging self-perceptions, younger work meta-stereotypes_{WC}) as statistical controls to demonstrate that age moderates specifically older worker meta-stereotypes_{WC}, as opposed to images of aging in general. To explore whether tenure, as a proxy for exposure to a particular image of older workers, also moderated the relationship between older worker meta-stereotypes_{WC} and promotion focus, we also calculated a tenure by older worker meta-stereotypes_{WC} interaction. Interaction terms were centered around their grand means (Aiken & West, 1991). The interaction terms were entered in a third step on the individual level. Once again, to avoid collinearity problems, the age by older worker meta-stereotypes_{WC} and the tenure by older worker meta-stereotypes_{WC} interactions were first entered one at a time before including both in the final model.

Results

The complete results of the multi-level regression analysis are available in Table 6. In Model 1a (including prevention focus, age, education and sex), age was negatively related to promotion focus, $\beta = -0.01$, $p = 0.05$. However, this effect disappeared once tenure was entered into the model. In the final model, tenure ($\beta = -0.01$, $p = 0.08$) but not age ($p = 0.35$) was marginally related to promotion focus. None of the other demographic variables on either level were significantly related to promotion focus (all $ps > 0.35$ in the final model). Of the other control variables, prevention focus was significantly related to promotion focus, $\beta = -0.15$, $p = 0.001$ in the final model. Positive affect was not related to promotion focus ($p = 0.23$ in the final model), nor was the measure of younger worker meta-stereotypes_{WC} ($p = 0.30$).

With regards to the two images of aging related variables central to our hypotheses, individuals' aging self-perceptions predicted promotion focus such that more positive aging self-perceptions were associated with higher promotion focus, $\beta = 0.32$, $p < 0.001$. There was no direct relationship between older worker meta-stereotypes_{WC} and promotion focus ($p = 0.46$). However, there was a significant relationship between promotion focus and the age by

older worker meta-stereotypes_{WC} interaction ($\beta = 0.02$, $p = 0.05$). In other words, age moderated the relationship between older worker meta-stereotypes_{WC} and promotion focus. As displayed in Figure 5, with increasing age, more positive older worker meta-stereotypes_{WC} corresponded with higher promotion focus. All else held equal, for a fifty-year old respondent, perceiving a more positive older worker meta-stereotype (top 25%) was associated with promotion focus approximately 1/3 of a standard deviation higher relative to an age-peer who perceived a less positive older worker meta-stereotype (bottom 25%).

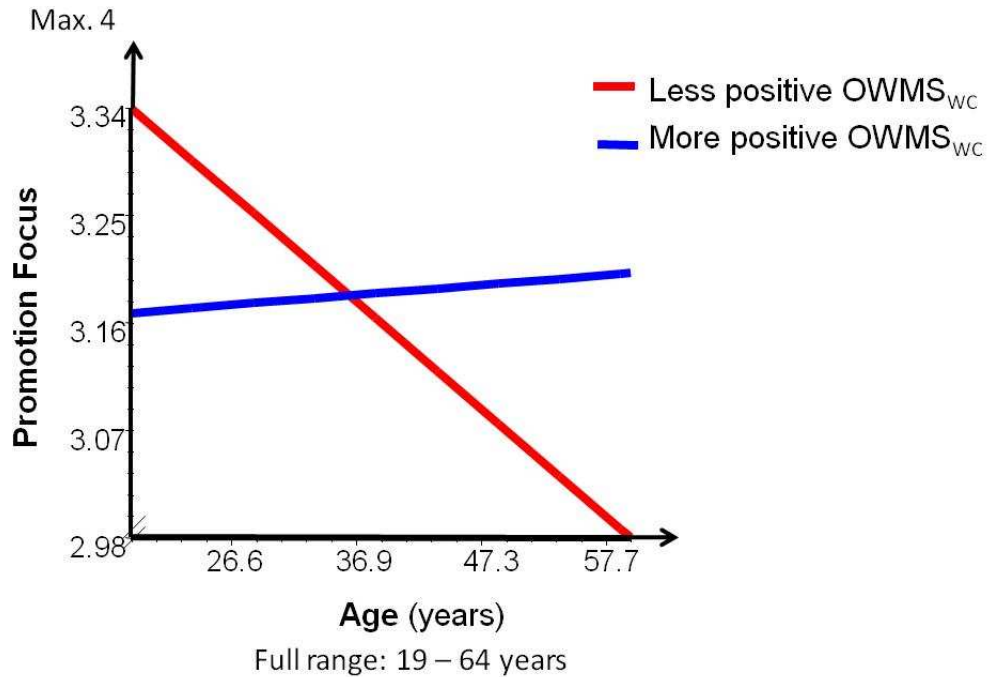
Neither the age by younger worker meta-stereotypes_{WC} nor the age by aging self-perceptions interactions reached significance ($p = 0.65$ and $p = 0.26$, respectively). The age by older worker meta-stereotypes_{WC} interaction remained a significant predictor of promotion focus after the tenure by older worker meta-stereotypes_{WC} interaction was included in the model ($\beta = 0.01$, $p = 0.056$ without tenure by older worker meta-stereotypes_{WC} versus $\beta = 0.02$, $p = 0.05$ with tenure by older worker meta-stereotypes_{WC} interaction). The effect of the tenure by age climate interaction did not reach significance either with or without the age by older worker meta-stereotypes_{WC} interaction ($p = 0.54$ without age by older worker meta-stereotypes_{WC} interaction and $p = 0.51$ with the age by older worker meta-stereotypes_{WC} interaction in the final model).

Table 6. Results of the multi-level regression analysis.

	Control Variables			Images of Aging: Direct Effects	Images of Aging: Direct Effects & Age Interactions
	Model 1a	Model 1b	Model 1c	Model 2	Model 3
Level 1 (Employee)					
Intercept	3.11** (0.06)	3.10** (0.07)	3.09** (0.07)	3.09** (0.07)	3.07** (0.07)
Age ^A	-0.01* (0.00)		0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Sex ^A (female)	0.09 (0.08)	0.08 (0.08)	0.07 (0.08)	0.08 (0.08)	0.06 (0.08)
Education ^A	0.02 (0.04)	0.00 (0.04)	0.00 (0.04)	0.00 (0.04)	0.01 (0.04)
Tenure ^A		-0.01* (0.00)	-0.01 [†] (0.01)	-0.01 [†] (0.01)	-0.01 [†] (0.01)
Prevention ^B	0.15** (0.04)	0.15** (0.04)	0.15** (0.04)	0.15** (0.04)	0.15** (0.04)
Pos. Affect ^B				0.06 (0.05)	0.06 (0.05)
ASP ^B				0.33** (0.08)	0.32** (0.08)
YWMS _{WC} ^B				0.08 (0.06)	0.08 (0.06)
OWMS _{WC} ^B				0.04 (0.06)	0.05 (0.06)
Age x OWMS _{WC}					0.02* (0.01)
Age x YWMS _{WC}					0.00 (0.01)
Age x ASP					0.00 (0.01)
Tenure x OWMS _{WC}					-0.01 (0.01)
Level 2 (Team)					
Company (Dummy)	0.10 (0.08)	0.13 (0.11)	0.12 (0.11)	0.12 (0.10)	0.14 (0.10)
Mean Age ^A	-0.01 (0.01)		-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Prop. Women	-0.01 (0.15)	-0.01 (0.15)	0.00 (0.15)	0.00 (0.14)	0.00 (0.14)
Mean Education ^A	-0.01 (0.04)	-0.03 (0.04)	-0.02 (0.04)	-0.05 (0.04)	-0.04 (0.04)
Mean Tenure ^A		-0.01 (0.00)	0.00 (0.01)	0.00 (0.01)	-0.01 (0.01)

Notes. ^A Variable has been centered around its group mean. ^B Variable has been centered around its grand mean. Pos. Affect = Positive affect; OWMS_{WC} = Older worker meta-stereotypes in the work context; YWMS_{WC} = Younger worker meta-stereotypes in the work context; ASP = Aging self-perceptions, Prop. Women = Proportion of women on team. [†] $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$

Figure 5. The relationship between older worker meta-stereotypes_{WC} and promotion focus increases with age.



Notes. OWMS_{WC} = Older worker meta-stereotypes in the work context. Less positive and more positive OWMS_{WC} represent the bottom and top 25% of the distribution, respectively.

Discussion

In the current research, we were interested in the extent to which aging self-perceptions and older worker meta-stereotypes in the current work context were related to working adults' promotion focus. Specifically, we hypothesized that more positive aging self-perceptions would be associated with higher promotion focus because aging self-perceptions are associated with perceptions of the opportunities for gains as well as resources for making those gains (e.g., control, time perspective, expectations with regards to future personal resources). We also hypothesized that more positive older worker meta-stereotypes_{WC} would be positively associated with higher promotion focus because older worker meta-stereotypes_{WC} represent perceptions of access to opportunities and resources for achieving

gains within the work context, as well as future time perspective in the current work role. We expected that age, as a measure of meta-stereotype self-relevance, would moderate the relationship between older worker meta-stereotypes_{WC} and promotion focus. These hypotheses were in line with previous experimental research which has associated positive self-relevant stereotypes with promotion focus (Seibt & Förster, 2004).

With regards to the images of aging variables, we found that aging self-perceptions were significantly related to promotion focus. People who perceived their aging more positively had higher promotion focus. Furthermore, older worker meta-stereotypes_{WC} were also positively related to promotion focus as age increased. These results are consistent with previous research on the association with the salience of a self-relevant positive stereotype and promotion focus (Seibt & Förster, 2004) and are in line with the self-regulatory function of an individual's images of aging (e.g. Brandtstädter & Greve, 1994; Brandtstädter et al., 1999; Rothermund & Brandtstädter, 2003; Wentura & Rothermund, 2005; Wurm et al., 2007). Only *older* worker meta-stereotypes_{WC} but not *younger* worker meta-stereotypes_{WC} were significantly related to promotion focus, even for younger workers for whom such stereotypes would be self-relevant. Together, these results indicate that there is something unique about images of one's *future* development that is related to promotion focus as opposed to images of, for instance, how the company treats employees in general or meta-perceptions of how one is currently or was in the past perceived as a younger worker.

Age, but not tenure, moderated the relationship between older worker meta-stereotypes_{WC} and promotion focus. This seems to suggest that the effects of older worker meta-stereotypes is more dependent on the meta-stereotype self-relevance (for which age is a proxy) as opposed to the duration of exposure to the older worker stereotype salient in the company (for which tenure is a proxy). Although not a part of our original hypotheses, we found that company tenure, but not age, was marginally negatively associated with promotion focus, at least for the age range within our sample of working adults (19 to 64 years). This result may suggest a selection procedure whereby those individuals with higher promotion focus are more willing to take on new challenges such as a new job. Alternatively, this result

might suggest that taking on new challenges, such as starting a new job, may help to stimulate and maintain a positive focus on opportunities for growth and improvements. Together, our results support a contextual perspective on development (e.g., Baltes et al., 1980) by demonstrating that promotion regulatory focus is related to contextual factors such as aging self-perceptions and older worker meta-stereotypes_{WC}, and possibly company tenure as well.

Older worker meta-stereotypes and age trends in promotion focus

It is a common part of our image of aging that older people are less oriented towards growth and improvement goals than younger people (Ebner, Riediger, & Lindenberger, 2009). Likewise, older workers are often assumed to be less motivated to learn, resistant to change and less creative (e.g., Pitt-Catsoupes, Smyer, Matz-Costa, & Kane, 2007; Postuma & Campion, 2009). These stereotypes seem to be associated with at least a 'kernel of truth' under current circumstances of aging. Relative to younger adults, older adults tend to be less oriented towards approaching possible gains (promotion focus) and more oriented towards avoiding losses (prevention focus) as demonstrated by studies using a wide variety of operationalizations (Ebner, 2005; Ebner et al., 2006; Freund & Ebner, 2005; Heckhausen, 1997; Heckhausen et al., 1989; Heckhausen & Krueger, 1993; Ogilvie, Rose, & Heppen, 2001).

In the current sample, we did not find evidence of a direct relationship between age and promotion focus, consistent with Ebner and colleagues (2006) who likewise did not observe any overall age differences in promotion focus between younger adults (18-26 years) and middle-aged adults (40-59 years). Interestingly, however, there was a negative relationship between age and promotion orientation among working adults who had less positive older worker meta-stereotypes_{WC} (see Figure 5). Our results suggest that age-related decreases in promotion focus may begin even earlier than previous research has suggested for people who have less positive images of aging, including older worker meta-stereotypes_{WC}. Our results may suggest that having more positive older worker meta-stereotypes_{WC} can help

working adults maintain a promotion focus that in turn can support their productivity in the work context (with regards to growth-related tasks and demands) as well as accumulate resources that are crucial for successful aging (Freund, 2008).

Is there a trade-off between promotion and prevention focus?

People can be high in *both* promotion and prevention focus (Higgins, Bond, Klein, & Strauman, 1986; Higgins 1997, 1998). Thus, maintaining promotion focus does not necessarily have to come at the cost of lower prevention focus. This is important because prevention focus can be highly adaptive with regards to development as well as conducive to higher performance in the work context. In fact, the positive stereotypes associated with older workers (e.g., reliable, loyal; Postuma & Campion, 2008) as well as the positive relationships between age and increased attendance and safety performance on the job (Ng & Feldman, 2008) would seem to be associated with the normative age-related increase in prevention focus and the associated increases in vigilance and focus on responsibilities (Ebner, 2005; Ebner et al., 2006; Freund & Ebner, 2005; Heckhausen, 1997; Heckhausen et al., 1989; Heckhausen & Krueger, 1992; Ogilvie et al., 2001). Ideally, individuals should actively strive to conscientiously meet responsibilities and avoid errors (prevention) *as well as* strive to make new gains and approach new accomplishments (promotion). Indeed, successful aging entails maximizing gains *and* minimizing losses across the life span (e.g., Baltes & M. Baltes, 1990; Freund, 2008). Given the different age-trends with regards to these two dimensions of regulatory focus, it seems that working adults' promotion focus might need more support than the contexts of aging (including the work context) currently offer. The current study suggests that fostering positive images of aging may be one way to help support adults' motivation to strive for gains and accomplishments.

Implications for organizations

Recent work suggests that age-related changes in motivational variables, as opposed to chronological age per se, play a key role in determining successful work outcomes for

middle-aged and older workers (Kanfer & Ackerman, 2004). Age-related changes in promotion focus represent a challenge to organizations and society at large who desire that employees continue to strive after new challenges and accomplishments well past young adulthood. Our results suggest that organizations can help support working adults maintain a promotion focus by fostering positive images of aging in the workplace.

Initial research has suggested that employees within a particular company to a certain extent share similar older worker meta-stereotypes. That is, there is enough within-company agreement to speak of an *organizational age climate*, the shared image of older workers amongst members of the company (Noack & Staudinger, 2010). Organizational age climate is operationalized as the company-level aggregate of employees' older worker meta-stereotypes_{WC}. In a case-study analysis, organizational age climate was associated with indicators of the company's age management strategies including knowledge management as well as policies and practices with regards to the hiring, retiring and training of older workers. In other words, it seems that companies can influence employees' older worker meta-stereotypes_{WC} through their policies and practices with regards to older workers (see also Maurer, 2001). Furthermore, because people's perceptions of generalized stereotypes about older adults tend to get incorporated into their own aging self-perceptions (Rothermund, 2005; Rothermund & Brandtstädter, 2003), we suggest that organizational age climate and individuals' older worker meta-stereotypes in the work context might have the potential to influence the aging self-perceptions that employees develop over time, thereby indirectly influencing goal orientation trajectories. This latter contention warrants future research.

Limitations and suggestions for future research

In the current research, we used a *general* as opposed to a work-domain specific measure of promotion focus. Thus, we cannot make claims about the relationship between our images of aging variables and working adults' focus on new accomplishments related to a particular work context. However, we think that the images of aging in the work context

'spill over' into other life domains (cf. Hogan & Roberts, 2004; Roberts et al., 2005; Schooler et al., 2004) and thus affect individuals' general promotion focus. We would expect to find even stronger relationships between older worker meta-stereotypes_{WC} and work domain-specific promotion focus, given that the effects of age stereotypes tend to be strongest when the stereotype content corresponds to the outcome domain (stereotype matching effect; Levy & Leifheit-Limson, 2009).

Although we used a previously validated scale to measure promotion focus, the alpha value was rather low in the current sample (Cronbach's $\alpha = 0.42$). One potential explanation for the low (though still satisfactory for a two-item scale) alpha is that the variability was somewhat restricted in our sample. We do not know if this alpha is unusually low, as Cunningham and colleagues did not report the Cronbach's α for the two items (Cunningham et al., 2005).¹³ Replication of the current results with a different measure of promotion focus would help to confirm our results.

In the theoretical introduction of this chapter, we suggested several possible mediating mechanisms that may potentially underlie the relationship between promotion focus and aging self-perceptions (e.g., control, outcome expectancies, time perspective) as well as older worker meta-stereotypes (e.g., perceptions of resources and opportunities for gains within the work context, time perspective in the work context). However, the current study did not empirically test these claims. Future research with regards to the mediating mechanisms might be helpful in order to better understand how images of aging affect promotion focus as well as offer more specific points of intervention. For instance, it might be easier and/or more effective for organizations to influence employees' time perspective (e.g., by changing retirement policies) than to influence employees' overall image of aging.

¹³ The results of a re-analysis of the final model with each of the single items as the dependent variable suggested that there was a stronger relationship between the images of aging variables and responses to item 1 (*I focus on opportunities that will enhance my life*) than with responses to item 2 (*I am primarily motivated by seeking potential successes*). In retrospect, the second item might be understood as representing a more cautious, risk-averse motivational style in which *only* goals where one explicitly expects success are attempted, as opposed to approaching goals that will result in growth, regardless of whether one expects to succeed or fail.

Of course, our cross-sectional procedure limits our ability to infer causality or directionality in the relationship between aging self-perceptions and older worker meta-stereotypes_{WC} and promotion focus. For instance, even though we controlled for positive affect, we cannot exclude the possibility that individuals with a strong, chronic promotion focus project this goal orientation onto their images of aging, a sort of ‘seeing the world through rose colored glasses’. Nor does our cross-sectional sample allow us to separate possible cohort effects from developmental processes. Cross-sequential longitudinal designs would be needed in order to establish the causality of older worker meta-stereotypes_{WC} or aging self-perceptions on changes in promotion focus over time (Baltes & Nesselroade, 1970).

The specifics of our sample may also present a limiting factor. Our sample of working adults, particularly *older* working adults, is most likely a rather selective sample of relatively robust individuals who have survived a rather old age-unfriendly labor market. Furthermore, it is quite plausible that promotion focus is associated with the selection of adults into the work force. The selectivity of our sample may imply that the ‘true’ effects of images of aging on promotion focus are actually much more dramatic when less-resilient and potentially less promotion-oriented individuals are taken into account. Furthermore, since we only had two companies in the sample, we cannot be sure that our results extend to other companies with other organizational environments. We note however that both of the companies in the current sample have rather positive organizational age climates relative to a pool ($N=12$) of other companies where we have collected age climate data (see Figure 4, Chapter 8). Thus, it is plausible that our results actually underestimate the effect of older worker meta-stereotypes_{WC} as we would expect stronger effects from less positive meta-stereotypes.

Finally, although we have suggested that images of aging are related to promotion focus, we do not mean to suggest that images of aging are the only or even the predominant factor affecting either current or developmental trajectories in promotion focus. Biological factors also certainly play a role. For instance, promotion focus has been associated with distinct areas of the brain (e.g., Cunningham et al., 2005; Eddington, Dolcos, Cabeza,

Krishnan, & Strauman, 2007; Schindler & Staudinger, 2005) which may be differentially subject to biological age-related changes.

Conclusion

Adults are being challenged to continue to pursue growth-related goals well beyond young adulthood, especially within the work context. The current research has demonstrated that working adults' perceptions of their own aging as well as their meta-stereotypes of older workers are related to or, using the vocabulary of the resource model, bundled together with their promotion focus. Our results suggest that positive images of aging can be a developmental resource that supports working adults' pursuit of growth-related goals—and thus potentially reach the upper limits of their developmental plasticity. The work context, as the context where most young and middle-aged adults spend a large proportion of their time and pursue their goals, represents an important arena for fostering the kind of positive images of aging that can help adults maintain a motivation towards approaching possible gains and improvements.

This chapter has empirically demonstrated one way in which images of aging affect the plasticity of development, namely, by being linked with their motivational orientation. In the next chapter, I analyze the relationship between images of aging in the work context and a second mechanism by which images of aging affect, that is, by affecting working adults' intentions to leave (or stay) in their current work context.

Chapter 10

Do I Want to Get Older Here? Images of Aging in the Work Context and Employee Turnover Intentions¹⁴

It is well accepted that individual agency and decision, alongside biology and external contexts, play a crucial role in human development (e.g., Baltes et al., 2006; Brandtstädter, 2006; Brandtstädter & Rothermund, 2002; Heckhausen, Wrosch, & Schulz, 2010). This is especially true for adults, who, relative to children and adolescents, exercise considerable (though of course bounded) freedom to decide in which contexts they develop. Adults engage in various activities of intentional self-development as they attempt to bring themselves and their development in line with their values and images of optimal development (Brandtstädter & Rothermund, 2002).

For working adults, the work context is one of the most important contexts of adult development (e.g., Bowen et al., in press). For instance, the work context may influence the attainment of individuals' goals to continue learning, to have satisfying relationships with their colleagues, to maintain a positive self-concept, to optimize positive affect as well as achieve career goals. Work contexts also vary with regards to physical and/or mental stress and thus, for instance, influence long-term health trajectories. Given the developmental importance of the work context, adults' decisions to leave (or stay in) job contexts characterized by developmental resources (e.g., the ability to take on new roles, further training opportunities, supportive climate for development) as well as developmental risks (e.g., physically straining work, negative climate) play a decisive role in determining their developmental potentials.

Because working adults age and develop in the work context, we think that people's images about their own aging as well as the images of aging in their work context influence their decisions to leave or stay in a particular job. In this chapter, we investigate how working

¹⁴ This chapter is a pre-print of an article submitted to a journal of the American Psychological Association for publication.

adults' *aging self-perceptions*—that is, how adults perceive their own aging process—and two measures of images of aging within the work context, namely working adults' perceptions of how positively older workers are perceived within their working group (i.e., *older worker meta-stereotypes_{WC}*) and their supervisors' aging self-perceptions, each influence working adults' intentions to leave their current job (i.e., their turnover intentions).

Images of Aging and Turnover Intentions

Aging self-perceptions and turnover intentions

Aging self-perceptions refer to how individuals perceive their own aging process, including already lived experiences and generalized expectations with regards to their aging in the future (Steverink et al., 2001). There are several reasons to believe that aging self-perceptions are associated with working adults' turnover intentions. Aging self-perceptions are associated with future time perspective, such that more positive aging self-perceptions are associated with a longer time perspective (Wurm et al., 2007). Therefore, aging self-perceptions might influence turnover intentions because changing jobs makes more sense when one expects to have time to 'reap the benefits' of changing a job. Individuals' aging self-perceptions can also be seen as developmental control beliefs and self-efficacy beliefs (Wurm et al., 2007). People with more negative aging self-perceptions may be less confident that they will be able to live up to the demands of a different work context and may therefore not have a strong desire to leave an organization, even when a situation is undesirable. Finally, it has been suggested that more positive aging self-perceptions may be associated with greater openness to new experience as a result of an orientation towards continuous growth (Steverink et al., 2001). Thus, people with more positive aging self-perceptions may be more open to new experiences such as beginning a new job, and hence have higher turnover intentions. In sum, it seems that more positive aging self-perceptions should be directly associated with higher turnover intentions.

Older worker meta-stereotypes in the work context and turnover intentions

Surveys suggest that working adults have well defined perceptions of stereotypes about older workers (e.g., CIPD, 2001; Marsh & Sahin-Dikmen, 2002). Previous work on organizational age climate suggests that the extent to which older workers are positively perceived varies across different work contexts (e.g., organizations) (Noack & Staudinger, 2010). How might adults' perceptions of the older worker stereotypes in their current work context affect their likelihood that they will intend to leave their job?

Experimental research has demonstrated that believing that someone holds a positive belief about your social group can lead to positive behavior in line with the stereotype (Oldenhuis, 2007). This effect is thought to arise at least in part due to reciprocity motives (Gouldner, 1960) whereby groups that are thought to perceive one's own social group positively are 'rewarded' for their positive beliefs (Oldenhuis, 2007). In line with these findings, working adults' who believe that older workers are perceived more positively in their work context may feel inclined to continue to invest resources in that work context on the basis of reciprocity. This hypothesis is also in line with organizational research which has found that employees feel obliged to repay an organization with extra effort and loyalty when they have then feeling that the organization values their contributions and well-being (e.g., Eisenberger, Armeli, Rexwinkel, Lynch, & Rhoades, 2001). Older worker meta-stereotypes_{WC} would seem to represent employees' perceptions that the company will value their contributions and invest in their well-being over the long run and thus, employees may reward the current work group or organization by intending to stay in his or her job.

In addition to the reciprocity motive, a second reason we think that older worker meta-stereotypes_{WC} are related to turnover intentions is based on people's general desire to be seen positively by others (e.g., Leary, 2007). Working adults' older worker meta-stereotypes_{WC} should be a proxy for the belief that they are currently viewed positively (for older workers), and will be viewed positively in the future. Therefore, we expect that more positive older worker meta-stereotypes_{WC} should be associated with lower turnover intentions. In contrast, we would not generally expect more positive *younger* worker meta-

stereotypes to be related to turnover intentions because only older worker meta-stereotypes_{WC} are related to one's *future* in the company which would seem more relevant to intentions to pursue a *future* in the current job.

The relevance of supervisors' aging self-perceptions for turnover intentions

Supervisors have their own aging self-perceptions which may *indirectly* affect employees' turnover intentions. Supervisors who have more negative aging self-perceptions may be especially vulnerable to believing that their subordinates have similar—or worse—age-related losses. As demonstrated by an eight year cross-sequential study, self-ratings on age-relevant characteristics over time affected general expectations about the “typical old person” (i.e., externalization; Rothermund & Brandtstädter, 2003). Thus, supervisors may expect that their subordinates' aging experiences to be somewhat similar to their own. In particular, adults have the tendency to underestimate the qualities of others, especially in domains in which the respective adult him- or herself has experienced an (age-related) threat or problem (Heckhausen & Brim, 1997). Thus, supervisors with negative aging self-perceptions may thus attribute even *worse* aging-related losses and constraints to their subordinates. Furthermore, Hassell and Perrewé (1995) suggested that supervisors may be particularly likely to use their subordinates' aging and age-related characteristics as the basis for self-enhancing downward social comparisons. The authors argued that supervisors—who themselves tend to be somewhat older—seek to distinguish themselves from the ‘older worker’ group in an attempt to maintain a positive self-image and in doing so may exaggerate negative stereotypes of older workers.

Together, these results suggest that supervisors' aging self-perceptions—and particularly when they are more negative—might color their general age stereotypes and their perceptions of their aging subordinates. This is important because supervisors' age-related beliefs may consequently color their decisions regarding task assignment, appraisal, development potential, promotions or pay raises, and training. For instance, it has been suggested that supervisors' age stereotypes affect their performance attributions (Ferris,

Yates, Gilmore, & Rowland, 1985). In a study of nurses and their supervisors, it was found that supervisors were more likely to attribute low performance to (lack of) ability when evaluating older employees, and high performance to (high) ability when evaluating younger employees. Supervisors' age-related beliefs are also thought to affect their decisions regarding further training and other developmental resources (e.g., Maurer et al., 2003). A questionnaire study demonstrated that the more respondents perceived older workers in general as being adaptable to change, the more favorable were their views with regards to training, promoting, retaining and working with older workers (Chiu, Chan, Snape, & Redman, 2009). Supervisors' aging self-perceptions may also affect their comparison standards against which they evaluate their subordinates (Heckhausen & Brim, 1997; Krueger, Heckhausen, & Hundertmark, 1995). For instance, supervisors with a very positive aging self-perception may expect that employees invest more in developmental activities like training or taking on new tasks and/or have a higher standard of performance for older employees.

We do not expect that all employees will find such high expectations for developmental activities and standards for performance desirable. Employees with more negative aging self-perceptions may perceive the developmental expectations of supervisors as unreasonable or may feel threatened by his or her more positive aging self-perceptions. Employees with more negative aging self-perceptions who see little utility in investing in continuous development, or who see such expectations as unrealistic given their experience of age-related losses, are likely to be annoyed by supervisors' high developmental expectations. Likewise, employees with more positive aging self-perceptions are likely to be irritated by supervisors who perceive their own aging as a process of decline. Thus, we expect that the relationship between supervisors' aging self-perceptions and employee turnover intentions to be *entirely* dependent on the employee's own aging self-perceptions (no direct effect). Specifically, we predicted that the similarity between employee aging self-perceptions and supervisor aging self-perceptions (employee-supervisor ASP similarity) would be related to turnover intentions, such that *greater similarity* would be associated with

lower turnover. This hypothesis is in line with findings that employee-supervisor similarity in “growth need strength” predicted employee trust and loyalty to their supervisor over and above demographic similarities (Huang & Lun, 2006) and is in line with a robust area of organizational research that has demonstrated that employee-supervisor similarity on deep-level characteristics (as opposed to superficial characteristics like demographics) predict positive work-related outcomes (Harrison, Price, Gavin, & Florey, 2002). We think that aging self-perceptions can be considered one such deep-level characteristic.

Why should positive older worker meta-stereotypes_{WC} be directly associated with lower turnover intentions, but not supervisors’ positive aging self-perceptions? Employees can benefit from more positive older worker meta-stereotypes_{WC} in terms of feeling good about the self, one’s working role and/or the work context without having to ‘do’ anything to prove whether they as individuals are worthy of the positive image. In contrast, supervisor’s aging self-perceptions affect the work context in a much more concrete way through task assignment, evaluation, face-to-face communication, expectations and opportunities. Employees have to ‘live up’ to a supervisor’s positive aging self-perception which makes a match in aging self-perceptions more important.

Images of aging and person-environment fit: Asymmetrical effect of positive images of aging

Generally, people tend to prefer environments that help them to sustain existing self-concepts, allow them to express their personality traits and attitudes, and help them to achieve their personal goals (see Ickes et al., 1999 for a review). Person-environment fit is also one of the most prevalent concepts in the organizational literatures, with high “fit” between the employee and various aspects of the organizational context (e.g., role demands, supervisor, colleagues, company values) assumed to optimize organizational outcomes, including turnover decisions (see Kristof-Brown, Zimmerman, & Johnson, 2005 for a review). Substantial misfit between (a) working adults’ values and personal (future) goals, and (b) the existing job context can lead to turnover, even if individuals are generally

(currently) satisfied with their jobs (Mitchell & Lee, 2001). Employees make judgments about whether they can achieve their personal goals while staying with the current organization which can be the basis for judgments about job satisfaction as well as expectations with regards to how long a current level of job satisfaction can be maintained or if it will change in the future (Mitchell & Lee, 2001). Similarly, we think that employees use their aging self-perceptions as a basis for making turnover decisions, that is, in deciding whether they will be able to optimally develop in their current work context given the age-related constraints they experience and/or expect to experience. To a certain extent, we think that individuals seek work contexts that match (or fit) with their aging self-perceptions. We think older worker meta-stereotypes_{WC} and supervisors' aging self-perceptions are indicators of the developmental opportunities within a given work context.

In the case of aging self-perceptions, however, we hypothesized an *asymmetrical* effect of person-environment fit. Namely, we suspect that it is particularly people with more *positive* aging self-perceptions that are more likely to intend to leave a job context that doesn't match their aging self-perceptions. People with more positive aging self-perceptions are more likely to initiate assimilative 'corrective' activities (e.g., changing jobs) when they are dissatisfied with their developmental attainments or prospects because of their higher control beliefs, optimism, and self-efficacy (Brandtstädter & Greve, 1994). Furthermore, people are especially reluctant to accept information that would downgrade their ideas of themselves (Baumeister, 1998), and thus it seems the most likely case that people who perceive their aging positively intend to leave work contexts characterized by more negative images of aging (e.g., older worker meta-stereotypes_{WC}, supervisors' aging self-perceptions). We therefore hypothesized that people with more positive aging self-perceptions would be more likely than people with negative aging self-perceptions to intend to leave a work context they perceive as characterized by less positive stereotypes of older workers, and/or characterized by a supervisors with negative aging self-perceptions.

Does age play a role?

Generally speaking, the more self-relevant an activated stereotype is, the greater will be its effect (Levy, 1996; Marx & Stapel, 2006; Wheeler & Petty, 2001; see also Chapters 5 and 9). This might lead to a hypothesis that the relationship between older worker meta-stereotypes_{WC} and turnover intentions might be dependent on age as a proxy measure of the self-relevance of the older worker meta-stereotype. However, in the case of turnover intentions, we think that images of aging in the work context are also relevant for younger adults because images of aging in the work context represent their *future* developmental possibilities with their current job, which should in turn affect their intentions to pursue a *future* in the current job. Furthermore, the cost-benefit relationship of job turnover changes with age. With increasing tenure (which generally correlates highly with age), leaving a job entails leaving accrued benefits (e.g., time accrued for sabbaticals, office location, knowledge of how the institution works; Mitchell & Lee, 2001). Middle-aged and older workers might face (or think they might face) age discrimination in the outside labor market if they decide to leave their job (Weiss & Maurer, 2004), lowering their turnover intentions due to (perceived) reduced alternatives. Meanwhile, the potential benefit of changing jobs might be higher for younger employees who, generally speaking, have more time left in their careers and thus more time to benefit from the developmental resources potentially offered at a new job (or more time to suffer from an unfavorable current job context if they stay). In the case of a misfit between aging self-perceptions and the work environment, people can change their images of aging (including their aging self-perceptions or how they view the images of aging in the work context) or leave the job (see also Mitchell & Lee, 2001). Older adults have a greater tendency to cope in accommodative (e.g., adjusting expectations, images of development) as opposed to assimilative (e.g., changing jobs) ways (e.g., Brandtstädter & Renner, 1990). Likewise, older workers tend to be more strongly oriented toward maintaining the status quo (Kanfer & Ackerman, 2004). These findings suggest that developmental goals and expectations as embodied in aging self-perceptions might be a more important influence on *younger* people's turnover intentions. Although we did not have

fixed hypotheses for the moderating role of age, we did explore whether age moderated any of the relationships between the images of aging variables and turnover intentions.

Current study

To sum up, the current study explored how individuals' aging self-perceptions, their older worker meta-stereotypes_{WC}, as well as their supervisors' aging self-perceptions were related to turnover intentions. More positive aging self-perceptions are associated with a more extended time perspective, higher internal control beliefs, higher self-efficacy, and more openness to new experience. We therefore expected that more positive aging self-perceptions would be associated with higher turnover intentions (Hypothesis 1). More positive older worker meta-stereotypes might encourage reciprocity towards the company and may satisfy employees' desires to be viewed positively, now and in the future. We therefore expected that that more positive older worker meta-stereotypes_{WC} would be associated with lower turnover intentions (Hypothesis 2a). We expected an asymmetrical moderation effect such that people with more positive aging self-perceptions would be more likely to leave a work context characterized by less positive older worker meta-stereotypes_{WC} relative to people with less positive aging self-perceptions (Hypothesis 2b). Finally, supervisors' aging self-perceptions may color their perceptions of their subordinates and affect their decisions with regards to, for example, task assignment, further training and appraisal. Therefore, in line with previous research on employee-supervisor deep-level similarities, we hypothesized that employee-supervisor ASP similarity would predict employees' turnover intentions such that dissimilarity would lead to higher turnover intentions and similarity to lower turnover intentions (Hypothesis 3a). Once again, we expected an asymmetrical moderation effect such that especially people with more positive aging self-perceptions would be more likely to intend to leave work contexts characterized by supervisors with more negative aging self-perceptions (Hypothesis 3b).

Method

The characteristics of the sample and data collection procedure were detailed in Chapter 5.

Sample

The current study refers to a sub-sample which excluded four teams for which we did not have supervisor data ($n = 298$, $k = 32$). The subsample did not differ from the full sample ($N = 337$, $k = 36$) on any of the relevant demographic variables.

Control variables

We wanted to demonstrate that the images of aging variables had an 'added value' for predicting turnover intentions. Therefore, we controlled for the 'standard' predictors of turnover intentions. A recent meta-analysis has demonstrated robust relationships between turnover intentions and job satisfaction and affective commitment, as well as skill requirements, age, tenure, gender, and education (Griffeth et al., 2000). We therefore statistically controlled for age, tenure, gender, education, job satisfaction and affective commitment on level 1. An aggregate measure of team education on level 2 was used to approximate the skill requirement of the job. We also used a measure of positive affect to control for common method bias (Podaskoff et al., 2003). Finally, in order to capture the unique relationship between meta-stereotype of older workers and turnover intentions as opposed to general perception of the social climate for all workers (regardless of their age), we also statistically controlled for younger worker meta-stereotypes_{WC}.

Measures

The demographic variables and the images of aging measures (aging self-perceptions, older worker meta-stereotypes_{WC}, and younger worker meta-stereotypes_{WC}) were detailed previously. Only those measures not already detailed will be mentioned here.

Turnover intentions. Respondents answered the single-item, “*In the last 12 months, have you thought about changing your job, either within your company or to another company?*” using four ordinal response categories: *No* (49.8%); *Yes, I’ve thought about it* (28.8%); *Yes, and I’ve looked around some* (15.1%); and *Yes, and I’ve looked around intensively* (6.4%). This distribution is in line with representative data on turnover intentions in Germany (Sousa-Poza & Henneberger, 2004).

Job satisfaction. Respondents indicated their satisfaction with seventeen facets of their job (e.g., salary, job content, autonomy) adapted from Warr, Cook and Wall, (1979). The five-point Likert scale ranged from 1 ‘very unsatisfied’ to 5 ‘very satisfied’. Answers to all items were averaged to form a measure of overall job satisfaction (Cronbach’s $\alpha = 0.90$).

Affective commitment. Affective commitment was measured with four items adapted from Allen and Meyer (1990). An example item is, “I don’t feel very emotionally attached to my company” (reverse coded). Answers could range from 1 ‘almost never’ to 5 ‘often’. The four items were averaged (Cronbach’s $\alpha = 0.72$).

Data analysis strategy

Missing data. To preserve power, missing values on all items were imputed using the Expectation-Maximization (EM) algorithm. Monte Carlo studies have shown that imputing missing values using the EM algorithm produces less biased results than either list-wise deletion (Graham & Donaldson, 1993; Malhotra, 1987; Muthén et al., 1987) or pair-wise deletion (Muthén et al., 1987). The maximum percentage of missing values for all of the variables was 9.8% for younger worker meta-stereotypes_{WC} and 7.4% for older worker meta-stereotypes_{WC}. All other variables had 1.8% or fewer missing responses. This procedure resulted in a final sample of 298 employees nested in 32 teams.

Interactions. Employee-supervisor ASP similarity was modeled as a cross-level interaction term (see also Huang & Lun, 2006 and Sacco, Scheu, Ryan, & Schmitt, 2003 for similar methodological approaches). To check for the moderating influence of stereotype self-relevance (age), we calculated three interactions: age by older worker meta-

stereotypes_{WC}, age by aging self-perceptions, and age by younger worker meta-stereotypes_{WC} (control). In each case, interaction terms were centered around their grand means (Aiken & West, 1990).

Statistical analysis. Because we had nested data (employees in teams) and an ordinal dependent variable (turnover intentions; four ordinal categories), we analyzed the data using two-level ordinal logistic hierarchical linear modeling with HLM version 6.06 software (Raudenbush et al., 2004). Company differences were statistically controlled for by using a dummy variable on level 2. Coefficients indicate the likelihood of answering in the baseline category (no intention to leave current job). Therefore, negative coefficients indicate *higher* turnover intentions. Threshold levels indicate the probability of answering in each successive category. Unless otherwise noted, a two-sided significance level of $p = 0.05$ was used to determine the statistical significance of the coefficients. All demographic variables were entered on both the individual and team level (as team aggregates) to separate individual from contextual effects (cf. Chan, 1998).¹⁵

Importantly, the coefficients and significance values of interaction terms in nonlinear models are not directly interpretable because the direction of the interaction effect may change over the full range of the distribution (e.g., Ai & Norton, 2003). Therefore, we plotted the relationship between employees' aging self-perceptions and the probability of having no turnover intentions for positive and negative values (top and bottom 25%) of supervisor aging self-perceptions (cf. Hox, 2002). We used the plotted values to interpret the effects of employee-supervisor ASP similarity (see Figure 6).

Results

Table 7 displays the means and standard deviations of the continuous variables on level-1 as well as the intercorrelations. Table 8 displays the results of the ordinal logistic hierarchical analysis.

¹⁵ Analysis did not support the existence of a meaningful team level age climate for either older or younger workers (see Chapter 8). We therefore did not include these team level aggregates in the current model. However, in a separate analysis, including team level age climate for older and/or younger workers did not change the results.

Table 7. Means, standard deviations and intervariable correlations (Level 1).

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	9	10	11
1 Age	39.42	10.53										
2 Sex (Female)	-	-	-0.13*									
3 Tenure	9.69	9.78	0.66***	-0.11								
4 Education	3.60	1.17	0.04	-0.04	-0.11							
5 Pos. Affect	2.97	0.57	0.12*	0.01	0.12*	0.02						
6 Satisfaction	3.43	0.61	0.13*	0.04	0.10	0.13*	0.48***					
7 Commitment	3.64	0.81	0.29***	0.01	0.19***	0.13*	0.31***	0.44***				
9 ASP	3.01	0.38	0.05	0.02	0.02	0.13*	0.23***	0.13*	0.11			
10 OWMS _{WC}	2.90	0.49	0.24***	-0.05	0.14*	-0.11	-0.17**	0.29***	0.26***	0.23***		
11 YWMS _{WC}	2.94	0.44	-0.17**	-0.02	-0.06	0.13*	0.11	0.14*	0.03	0.00	0.06	
12 Turnover	-	-	-0.27***	0.05	-0.30***	0.26***	-0.29***	-0.35***	-0.30***	0.04	-0.30***	0.04

Notes. ASP: Aging self-perceptions. OWMS_{WC}: Older worker meta-stereotypes in the work context. YWMS_{WC}: Younger worker meta-stereotypes in the work context. Turnover: Turnover intentions. Two-tailed *p* values: * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Table 8. Results of the ordinal hierarchical logistic analysis

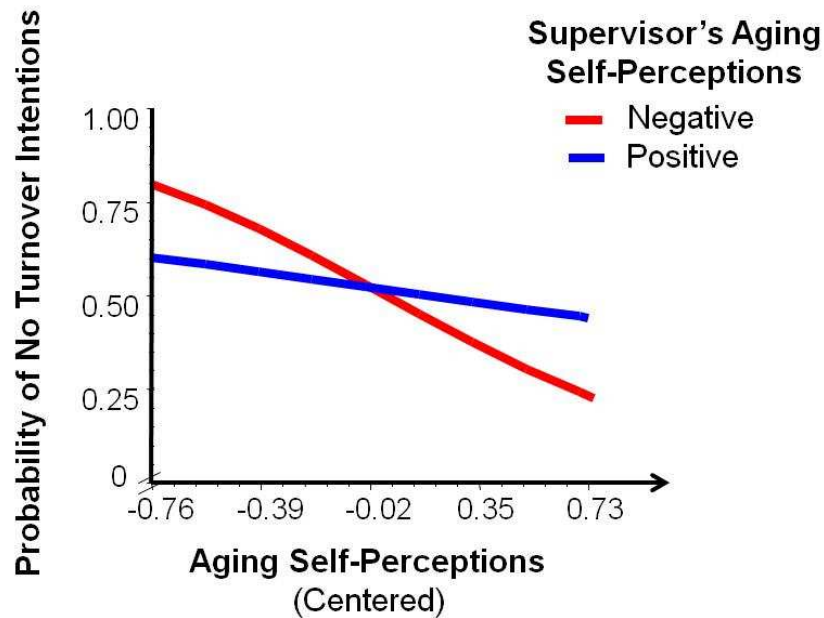
	Variable	Regression Coefficients (SE)	Odds Ratio	95% Confidence Interval
Level 1 (Employee)				
Statistical Controls	Intercept	0.21 (0.34)	1.2	(0.64, 2.39)
	Age ^A	0.05* (0.02)	1.05	(1.01, 1.09)
	Sex (Female)	0.34 (0.34)	1.41	(0.72, 2.76)
	Education ^A	-0.48** (0.16)	0.62	(0.45, 0.85)
	Tenure ^A	0.02 (0.03)	1.02	(0.97, 1.08)
	Positive Affect ^B	0.55* (0.26)	1.74	(1.05, 2.88)
	Satisfaction ^B	1.11*** (0.28)	3.04	(1.75, 5.28)
	Commitment ^B	0.42* (0.17)	1.53	(1.09, 2.16)
	OWMS _{WC} ^B	0.65* (0.30)	1.92	(1.05, 3.49)
	YWMS _{WC} ^B	-0.31 (0.33)	0.73	(0.38, 1.41)
Images of Aging	ASP ^B	-1.00** (0.39)	0.37	(0.17, 0.79)
	OWMS _{WC} x ASP	-1.08 [†] (0.64)	0.34	(0.10, 1.19)
	Age x OWMS _{WC}	0.02 (0.03)	1.02	(0.96, 1.08)
	Age x YWMS _{WC}	-0.07* (0.03)	0.93	(0.87, 0.99)
	Age x ASP	-0.02 (0.04)	0.98	(0.91, 1.07)
Cross-level Interaction				
	ASP x Supervisor ASP	2.75* (1.25)	15.61	(1.13, 216.38)
	Age x ASP x Supervisor ASP	-0.10 (0.13)	0.91	(0.70, 1.17)
Level 2 (Team)				
	Company B	0.25 (0.48)	1.29	(0.50, 3.33)
	Team Age ^B	0.04 (0.05)	1.04	(0.95, 1.14)
	Prop. Women	-1.45* (0.68)	0.23	(0.06, 0.90)
	Team Education ^B	-0.82*** (0.22)	0.44	(0.29, 0.68)
	Team Tenure ^B	0.04 (0.05)	1.05	(0.95, 1.15)
	Supervisor ASP ^B	0.05 (0.48)	1.05	(0.41, 2.72)
	Threshold (δ2)	1.98*** (0.19)	7.23	(4.94, 10.60)
	Threshold (δ3)	3.81*** (0.32)	45.30	(23.24, 84.66)

Notes. OWMS_{WC} = Older worker meta-stereotypes in the work context. YWMS_{WC} = Younger worker meta-stereotypes in the work context. ASP: Aging self-perceptions. Prop. = Proportion. ^A Variable has been centered around the group mean. ^B Variable has been centered around the grand mean. Two-tailed *p* values: [†] *p* ≤ 0.10; * *p* ≤ 0.05; ** *p* ≤ 0.01; *** *p* ≤ 0.001

Control variables. On the team level (level 2), the proportion of women on the team ($\beta = -1.45, p = 0.03$) and team average education ($\beta = -0.82, p < 0.001$) predicted turnover intentions. Teams with more women and lower average education had lower turnover intentions. On the employee level (level 1), age ($\beta = 0.05, p = 0.02$) and education ($\beta = -0.48, p = 0.004$) predicted turnover intentions. Namely, turnover intentions decreased with increasing age and increased with more education. In addition, positive affect ($\beta = 0.55, p = 0.03$), job satisfaction ($\beta = 1.11, p < 0.001$), and affective commitment ($\beta = 0.43, p = 0.02$) were all significantly related to turnover intentions. All of these findings are consistent with the literature on turnover intentions (Griffeth et al., 2000).

Aging self-perceptions. Employees' aging self-perceptions predicted their turnover intentions ($\beta = -1.00, p = 0.01$). Specifically, more positive aging self-perceptions corresponded with higher turnover intentions. Supervisor aging self-perceptions had no direct effect on employee turnover intentions ($p = 0.92$). The hypothesized interaction between employee aging self-perceptions and supervisors' aging self-perceptions was significant ($\beta = 2.75, p = 0.04$). When the supervisor had positive aging self-perceptions, employee turnover intentions were relatively independent of their own aging self-perceptions (see Figure 6). When the supervisor had rather negative aging self-perceptions, employee turnover intentions were higher the more positive their own aging self-perceptions. In other words, employee-supervisor ASP similarity predicted lower turnover intentions, particularly when the supervisor had rather negative aging self-perceptions. Inspecting Figure 6, it can be seen that for an employee with aging self-perceptions one standard deviation more positive than the grand mean, the probability that s/he had no turnover intentions was approximately 50% when s/he or she had a supervisor with similarly positive aging self-perceptions (top 25%) versus approximately 35% when his or her supervisor had rather negative aging self-perceptions (bottom 25%).

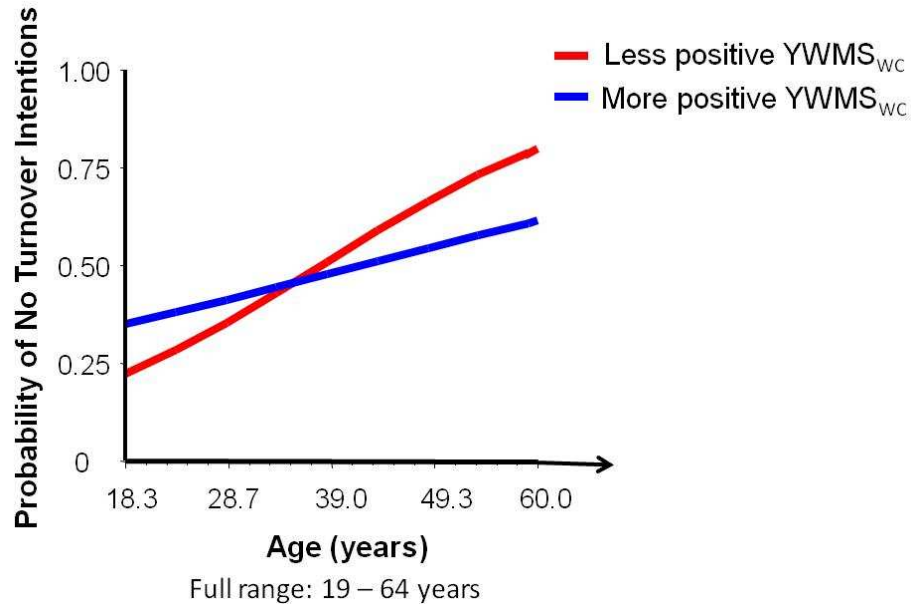
Figure 6. Interaction between supervisor and employee aging self-perceptions on employee turnover intentions.



Notes. Y-axis values represent the probability of having no turnover intentions. Negative and positive values for supervisor's aging self-perceptions represent bottom and top 25% of distribution.

Older worker meta-stereotypes. As expected, older worker meta-stereotypes_{WC} predicted turnover intentions ($\beta = 0.65$, $p = 0.03$). Specifically, more positive older worker meta-stereotypes_{WC} corresponded with *lower* turnover intentions. Neither age ($p = 0.56$) nor aging self-perceptions ($p = 0.09$) moderated the relationship between older worker meta-stereotypes_{WC} and turnover intentions. In other words, the correlation between the older worker meta-stereotype and turnover intentions was the same regardless of the employee's age or aging self-perceptions. In contrast, younger worker meta-stereotypes_{WC} had no significant relationship with employee's turnover intentions ($p = 0.35$). Unexpectedly, there was however a significant age by younger worker meta-stereotypes_{WC} interaction, ($\beta = -0.07$, $p = 0.02$). As displayed in Figure 7, less positive younger worker meta-stereotypes_{WC} were associated with lower turnover intentions at older ages.

Figure 7. Interaction between age and younger worker meta-stereotypes on employee turnover intentions.



Notes. Y-axis values represent the probability of having no turnover intentions. YWMS_{WC} = Younger worker meta-stereotypes. Less positive and more positive values represent bottom and top 25% of the distribution.

Discussion

In the current study, we investigated the relationships between individuals' aging self-perceptions, older worker meta-stereotypes_{WC} and supervisor's aging self-perceptions and working adults' turnover intentions. We expected two direct effects: Namely, we hypothesized that more positive aging self-perceptions would be associated with higher turnover intentions (Hypothesis1) and that more positive older worker meta-stereotypes_{WC} would be associated with lower turnover intentions (Hypothesis 2a). Based on previous research on employee-supervisor similarity, we expected that employee-supervisor ASP similarity would predict employees' turnover intentions such that dissimilarity would be associated with higher turnover intentions and similarity with lower turnover intentions (Hypothesis 3a). Finally, based on an

adapted theory of person-environment fit that specifically focuses on images of aging, we expected that there would be an asymmetrical moderation effect of aging self-perceptions such that people with more positive aging self-perceptions would be more likely to intend to leave a job context characterized by a mismatch with (i.e., more negative images of aging in the work context). Specifically, we expected that people with more positive aging self-perceptions would be more likely to intend to leave a job context characterized by less positive older worker meta-stereotypes_{WC} (Hypothesis 2b) and a job context in which the supervisor had a negative aging self-perception (Hypothesis 3b). We also explored whether age moderated any of these relationships.

The results were largely in line with our hypotheses. First, more positive aging self-perceptions were associated with higher turnover intentions (Hypothesis 1). This result is in line with the association between positive aging self-perceptions and other resources such as future time perspective, self-efficacy, internal control beliefs and openness to new experience which would seem to be related to turnover intentions. Age did not moderate this effect, indicating that aging self-perceptions are as an important a predictor of turnover intentions for younger as well as older employees.

As expected, more positive older worker meta-stereotypes_{WC} were associated with lower turnover intentions (Hypothesis 2a). This result is consistent with research which has consistently found that employees' perceptions of their work environment (i.e., their psychological climate) have important relationships with their attitudes towards that context, as well as their motivation and performance within that context (Parker et al., 2003). Our results are also in line with stereotype research that has found a relationship between negative (as opposed to less positive, as in the current study) stereotypes and tendencies to psychologically withdraw from a context (Aronson et al., 1999; Steele, 1997; Steele & Aronson, 1995).

As with aging self-perceptions, age did not moderate the relationship between older worker meta-stereotypes_{WC} and turnover intentions, indicating that positive older worker meta-stereotypes_{WC} were as important for younger as well as older

employees. In contrast, *younger* worker meta-stereotypes_{WC} were not directly related to turnover intentions. We interpret this results as indicative of the importance of images of aging (and older workers) for younger people, as images of aging characterize the possibilities for one's own *future* development (Brandtstädter & Greve, 1994; Brandtstädter et al., 1999; Rothermund & Brandtstädter, 2003; Wentura & Rothermund, 2005). The absence of an age interaction also introduces a caveat to the argument that stereotype self-relevance (in this case age) increases the effects of stereotype salience (e.g., Levy, 1996; Marx & Stapel, 2006; Wheeler & Petty, 2001). This may be because images of aging are different from other stereotypes in that they eventually apply to everyone. This result may also imply that other lifespan changes (e.g., in coping strategies, changes in job opportunities) might need to be considered in relation to the dependent variable of interest.

Interestingly, the unexpected result with respect to younger worker meta-stereotypes_{WC} are indeed in line with social psychological research and the salience of stereotypes about groups to which one does not belong. Older workers were more inclined to stay in work contexts they perceived as characterized by *less positive* younger worker stereotypes. This seems to indicate a contrast effect or stereotype lift, whereby downward social comparisons with a denigrated out-group can have positive effects (Walton & Cohen, 2003).

Finally, we expected that employee-supervisor ASP similarity would predict turnover intentions such that higher similarity would be related with lower turnover intentions (Hypothesis 3a). To some extent, the analysis confirmed our hypothesis: greater similarity was associated with lower turnover intentions. However, the results were more in line with the asymmetrical moderation hypothesis. Namely, we had expected that people with more positive aging self-perceptions would be more likely to intend to leave work contexts characterized by supervisors with negative aging self-perceptions (Hypothesis 3b). In line with the asymmetrical moderation hypothesis, employees with more positive aging self-perceptions were more likely to intend to

leave work contexts characterized by a supervisor with negative aging self-perceptions (see Figure 6). In comparison, mis-fit between an employee's negative aging self-perceptions and supervisors' positive self-perceptions did not have much of a relationship with turnover intentions.

Our analysis failed to support our hypothesis that people with more positive aging self-perceptions would also be more likely to intend to leave work contexts characterized by less positive older worker meta-stereotypes_{WC} (Hypothesis 3a). If anything, the interaction (which was marginally significant) suggested that more positive older worker meta-stereotypes_{WC} were more attractive for people with negative aging self-perceptions (not pictured). People with negative aging self-perceptions may benefit more from the self-enhancement of a positive meta-stereotype perception, since they do not have to 'prove' that they are worthy of the positive image. This seems to suggest that there could be a fundamental difference between older worker meta-stereotypes_{WC} which is a more global characteristic of the work context, and supervisor aging self-perceptions which are a more proximal characteristic of the work context. Employees do not have to 'do' anything to benefit from a positive image of older workers, whereas they have to 'live up' in concrete ways to a supervisor's aging self-perceptions. Therefore, while positive older worker meta-stereotypes_{WC} would seem to benefit the self-concept of everyone regardless of their own aging self-perceptions, the effect of supervisor's aging self-perceptions is much more dependent on whether individuals feel they can live up to supervisors' expectations. In terms of self-motives, our results may illustrate contextual differences in which *self-enhancement* motives (i.e., the desire to be seen positively by others) or *self-verification* motives (i.e., the desire to confirm self-views, even if they are negative) tend to dominate (see Leary, 2007 for a review of self-motives). Self-enhancement motives may dominate in situations in which an individual does not have to 'prove' that he or she is worthy of the positive image, whereas self-verification

motives may dominate in more dyadic, long-term relationships such as between an employee and his or her supervisor.

Together, our results indicate that images of aging are indeed related to working adults' turnover intentions. It seems that working adults use their aging self-perceptions as a guide for deciding whether to stay or leave a job, and that older worker meta-stereotypes_{WC} and supervisors' aging self-perceptions provide some indication of the (perceived) developmental opportunities in a particular work context. Our results add to the growing body of research regarding the effects of images of aging. For instance, laboratory research has demonstrated that activating an age stereotype by subtly manipulating situational cues (e.g., wording instructions to emphasize the relationship between age and memory) can affect older adults' memory performance (e.g., Chasteen et al., 2005; Hess et al., 2003) and general cognitive performance (Abrams et al., 2006). The current research complements this literature by investigating the effects of images of aging in a highly relevant field setting.

Our research is innovative in that we have considered turnover intentions from a developmental perspective (as opposed to an organizational perspective) in light of the influence of the work context on adult development (see Bowen et al., in press for a review). We suggest that voluntarily leaving one's job can in certain cases be an example of intentional self-development (Brandtstädter & Rothermund, 2002) as individuals try to bring their development in line with their own images of aging.

In addition to the developmental implications of turnover intentions via exposure to the developmental resources and risks offered by different work contexts, our results also have developmental implications specifically with regards to the images of aging that adults develop over time. Our results may well suggest that over time, supervisors' aging self-perceptions might influence how employees' aging self-perceptions develop and change, as the very characteristics that bring (and keep) a person to a certain environment are also likely to be the characteristics that change

over time (Roberts, Caspi, & Moffitt, 2003). For example, whereas people with positive aging self-perceptions intend to leave jobs in which the supervisor has negative aging self-perceptions, people with negative aging self-perceptions are less likely to leave. In this case, it seems likely that the employee's negative aging self-perceptions will thus be reinforced by his or her job context. Young adults would seem especially prone to the socialization effects of the images of aging within a work context, as the work context is generally one of the first contexts in which younger adults engage in a more age-heterogeneous environment as compared with highly-age segregated contexts like schools and universities. We suggest that helping supervisors to develop positive images of aging (including aging self-perceptions) can likewise encourage employees to maintain or strengthen a positive approach to their own aging. Importantly, we do not suggest that one-sidedly positive images of aging that ignore the negative aspects should be the goal. Rather, a balanced view that appreciates both the opportunities for continuous development as well as some of the limitations that may come with age would seem to be the most beneficial.

Implications for organizations

Although we have focused on the developmental implications of turnover intentions, our results have important implications for organizations. Turnover is extremely expensive for firms when the 'good' people leave. Firms face the costs of separation (e.g., knowledge-loss, administrative costs), replacement (e.g., advertising, time spent interviewing new candidates) and training of new employees, as well as indirect costs such as a drop in morale among remaining workers (Tziner & Birati, 1996). Meta-analysis has shown that turnover intentions, along with concrete job search, is the variable most predictive of actual turnover (Griffeth et al., 2000). The current research demonstrates that fostering positive older worker meta-stereotypes_{WC} is important for retaining employees *of all ages*, not just older employees. Furthermore, the current research highlights the importance of

supervisors' and employees' aging self-perceptions. The current research supports the notion that organizations can retain employees by helping employees and supervisors to clarify their own developmental expectations and goals and by fostering positive images of aging and older workers. Research on organizational age climate (see Chapter 1) has indicated that organizational age management strategies such as knowledge management, health and retirement practices as well as further training policies and practices (Noack & Staudinger, 2010) explain a significant proportion of employees' older worker meta-stereotypes_{WC}. Therefore, it seems that companies can help foster positive images of aging through human resource policies and practices.

Employees with more positive aging self-perceptions also had higher turnover intentions. At first glance, this result may seem to indicate a conflict of interest between individuals and societies on the one hand which benefit from positive aging self-perceptions, and organizations on the other hand, which have an interest to reduce turnover. However, the interaction effect between supervisor and employee aging self-perceptions indicates that individuals, society and organizations can all 'win' when employees with positive aging self-perceptions are matched with likeminded supervisors. In this case, turnover is reduced and organizations can then also benefit from employees' positive aging self-perceptions and associated indicators of positive adult development such as better health (Wurm et al., 2007). Furthermore, the low turnover of employees with negative aging self-perceptions may be indicative of a negative selection process whereby the employees less apt to invest in their positive development over the long run are more likely to stay—a pattern which does not necessarily benefit the company.

Limitations and suggestions for future research

The cross-sectional nature of the study limits our ability to draw conclusions about directionality. For instance, employees with higher turnover intentions may also

have less positive older worker meta-stereotypes_{WC} as the result of dissonance reduction (since they plan to leave their job) or a halo effect of negative feelings towards the company or working group. If this were the case, however, it is difficult to explain why such effects would be specific to older worker meta-stereotypes_{WC} and not occur in similar fashion for younger worker meta-stereotypes_{WC}.

The relevance of our results for organizations may be questioned since we used 'turnover intentions' and not actual turnover as our outcome variable. Although self-reported turnover intentions are a good predictor of actual turnover (e.g., Griffeth et al., 2000), a follow-up study that measures actual turnover would be needed to corroborate our findings. Furthermore, actual turnover is strongly influenced by labor market attributes such as unemployment rates (Hom & Kinicki, 2001). Our data does not allow us to analyze the relevance of images of aging for turnover intentions when labor market attributes have been taken into account. Also, we measured turnover intentions with a single item. Therefore, we cannot discern the reliability of this measure. Although meta-analysis has shown that the relationship between predictors (e.g., job satisfaction, affective commitment) and single-item measures of turnover intentions are as strong as with multi-item scales, single-item measures of turnover intentions are less predictive of actual turnover than multi-item scales (Tett & Meyer, 1993). Finally, our measure of turnover intentions confounded turnover within the organization and turnover to another organization. It could be that older worker meta-stereotypes_{WC} and employee-supervisor ASP similarity have different effects on different kinds (internal/external) of turnover. We would predict that older worker meta-stereotypes_{WC} are more predictive of external turnover, but employee-supervisor ASP similarity would be more predictive of internal turnover. This prediction is based on research that older worker meta-stereotypes_{WC} seem to differ between companies, but not necessarily between teams (see Chapter 8) and should therefore be more predictive of external turnover intentions. In contrast, a supervisor is specific to a

particular team context. Unfortunately, our measures do not allow us to test this hypothesis.

We cannot be sure that the current findings generalize to the greater population of companies and adults. For instance, the correlation between older worker meta-stereotypes_{WC} and turnover intentions may be specific to the two manufacturing firms in our sample. There may be other companies that attract (and retain) employees based on their 'young' image. Also, the lack of age interactions on either of our images of aging variables may be due to selection effects whereby older employees have had more time to find a job that fits with their aging self-perceptions or have readjusted their expectations to more closely match what they experience in their current job context (cf. Glickman, 2001, cited in Kail & Cavanugh, 2007). Finally, we caution that our results may not be generalizable to employees in other countries. There may be between-country differences in how people view the work domain which may influence the extent to which employee-supervisor similarity in aging self-perceptions is related to turnover intentions. For instance, images of aging may be less strongly related to turnover intentions in countries where people do not see the work domain as an arena for personal growth and development. Future research would profit from replicating our results with a wider variety of companies and perhaps cultural contexts.

Further research is also needed in order to identify the mediating mechanisms underlying the relationships between images of aging and turnover intentions, especially given that we had no evidence that affective commitment and job satisfaction completely mediated the relationships. 'Harder' relationships such as imbalances in the demand and supply of developmental resources like further training or opportunities to expand one's skill set by way of new task and role assignments may mediate the observed relationships with turnover intentions. We have also suggested that reciprocity motives may at least partially explain the relationship between older worker meta-stereotypes_{WC} and turnover intentions.

This chapter has demonstrated another way in which images of aging are related to the plasticity of adult development: by affecting adults' turnover intentions, and hence, their selection into certain work environments characterized by different developmental resources as well as risks. This general implication of our results, together with the results of the theoretical and other empirical analyses will be discussed in the following chapter.

Chapter 11

Images of Aging Are Related to the Plasticity of Adult Development

In this dissertation I aimed to (a) contribute to building a more complete theoretical framework for how images of aging affect adults' acute functionality and long-term development and (b) empirically investigate images of aging in the work context and their relationship with developmental and work-related outcomes. A broader aim of the dissertation was to demonstrate that images of aging are related to the plasticity of adult development.

Review of the Chapters

Chapter 2 introduced the three types of images of aging which were the main focus of the current dissertation: age stereotypes, age meta-stereotypes, and aging self-perceptions. I also discussed age stereotypes and age meta-stereotypes within the work context. Previous research on these three images of aging was integrated and presented.

In Chapter 3, I reviewed previous theoretical work on how images of aging affect adults. I presented research on the *internalization* of age stereotypes, whereby individuals (beginning at a young age) learn the age stereotypes in their society. Later on, these age stereotypes tend to *contaminate* (i.e., become integrated in) adults' self-concepts and aging self-perceptions as they begin to self-identify as old. However, adults' aging self-perceptions and self-concepts also color their age stereotypes, a process referred to *externalization*. Furthermore, (negative) age stereotypes can sometimes be used as the basis for self-enhancing downward social comparisons (*comparison processes*).

While the four processes described in Chapter 3 provide some clues about how images of aging affect adults, they fall short of providing a complete theoretical framework for how images of aging affect acute functionality as well as developmental outcomes. I argued that the lifespan psychology framework of development could be used to provide a

more complete meta-theoretical framework. In Chapter 4, I discussed key concepts from the lifespan psychology framework of development in order to build such a theoretical framework. The concept of *plasticity*, that is, the range and limits of development, plays a central role in the lifespan psychology framework and in this dissertation. Plasticity is determined by an individual's *reserve capacity*, that is, the sum total of "resources" available to the individual at any given time (Staudinger et al., 1995). I have argued that images of aging are components of as well as determinants of individuals' *baseline* as well as *developmental* reserve capacity, that is, the resources available at any single moment in time, which determine immediate functionality and the resources available for further development and growth, respectively. Images of aging are linked to several other resources important for baseline functioning as well as the accumulation (or disintegration) of developmental resource capacity over time.

In Chapter 5, I discussed in greater detail how images of aging are components as well as determinants of individuals' baseline reserve capacity. In this chapter, I focused on the relationship between contextual reminders of an age stereotype and acute functionality. I presented an integrated model for how contextual reminders of an age stereotype affect functionality. Specifically, I have argued that (a) age stereotype activation can stimulate automatic processes through spreading activation, (b) age stereotype activation can tax cognitive resources via arousal and (c) age stereotype activation can affect motivational resources. I have also argued that the extent to which age stereotype activation affects an adult depends upon three kinds of personal factors, namely (a) factors that moderate the extent to which the age stereotype cue represents a threat (or resource); (b) factors that moderate reactions to a 'threat' and (c) individual differences in how people cope with the age stereotype reminder. Importantly, many of these individual factors change over ontogenetic time. In sum, I argued that it is important that age stereotypes be considered relative to individuals' own psychological and physiological contexts.

In Chapter 6, I discussed images of aging as components as well as determinants of individuals' developmental reserve capacity. I drew on lifespan work on resilience and

reserve capacity (e.g., Staudinger et al., 1995) and discussed how images of aging affect individuals' developmental reserve capacity: (a) by affecting the meaningfulness of actions, (b) by affecting motivational orientation, (c) by affecting comparison standards and preferences, (d) as sources of stress and well-being as well as (f) by affecting selection to external contexts that differentially facilitate accumulation (or disintegration) of developmental resources. In sum, images of aging are linked to a number of developmental resources as well as being a source of stress which can directly affect developmental reserve capacity and hence, the plasticity of adult development. This chapter provided the theoretical backdrop for the empirical investigations covered in Chapters 7 through 10.

The empirical investigations covered in Chapters 7 through 10 demonstrated how images of aging within the work context can affect developing adults. The sample, data collection procedure and images of aging measures used in the empirical analyses were described in Chapter 7.

In Chapter 8 I described the statistical properties of the PACS which was designed to measure individuals' older worker meta-stereotypes in their work context. Age stereotypes about older workers are widespread (e.g., Postuma & Campion, 2009), and working adults are well aware of these stereotypes (e.g., CIPD, 2001). To date, however, there has been little research about the effects of older worker meta-stereotypes, particularly from a developmental perspective. The analysis in this chapter demonstrated that the PACS is a reliable measure of older worker meta-stereotypes. On the basis of this analysis, together with an analysis of the demographic predictors of older worker meta-stereotypes, I have made suggestions for future research with regards to the operationalization as well as predictors of older worker meta-stereotypes.

In Chapter 9, I investigated the relationship between images of aging (aging self-perceptions and older worker meta-stereotypes) and promotion orientation. The results of this analysis suggest that more positive aging self-perceptions and more positive older worker meta-stereotypes are associated with higher promotion orientation. This result empirically demonstrates one way in which images of aging are related to the plasticity of

adult development: By affecting adults' *motivational* orientation towards striving after gains, images of aging affect the extent to which adults push the limits of their developmental plasticity. In other words, images of aging can affect whether adults even attempt to reach the upper limits of their potential. Perhaps the most intriguing result discussed in Chapter 9 is the finding that there was a negative relationship between age and promotion orientation, but only for people who had less positive older worker meta-stereotypes. Age differences (declines) in promotion orientation were not observed in another study which considered a similar age range as the working adult sample analyzed in this dissertation (Ebner et al., 2006). This result may suggest that age declines in promotion orientation occur much earlier for people who have less positive images of aging.

Finally, in Chapter 10, I investigated the relationship between images of aging (aging self-perceptions, older worker meta-stereotypes, supervisors' aging self-perceptions) and working adults' intentions to leave their current job (i.e., their turnover intentions). The results of this analysis indicated that people with more positive aging self-perceptions were more likely to intend to leave their current job. People with more positive older worker meta-stereotypes were less likely to intend to leave their job. Finally, the similarity between supervisors' and employees' aging self-perceptions was also related to turnover intentions. In particular, employees with more positive aging self-perceptions were more likely to intend to leave a supervisor with more negative aging self-perceptions. These results demonstrate another way in which images of aging are related to the plasticity of adult development: by affecting adults' selection into work environments characterized by different developmental resources as well as risks.

Main Conclusions

In sum, this dissertation has met the two objectives laid out in the general introduction. I have drawn on aspects of the lifespan psychology framework of development to lay out a more complete meta-theoretical model that addresses both acute as well as developmental affects of images of aging. I have also provided empirical evidence of the

important relationships between images of aging within the work context developmental (as well as organizational) and the plasticity of adult development. In particular, I have demonstrated the usefulness of the older worker meta-stereotype construct as well as the PACS as a valid way to measure it.

The main, concluding results of the dissertation can be summed up in three important points:

Images of aging are related to the plasticity of adult development. Images of aging seem to act as “general purpose” resource (or risk) that constitute part of as well as affect baseline as well as developmental resources (or risks) across domains of functioning. Negative images of aging subtract from individuals’ reserve capacity, and as such, tend to promote further resource loss and act as a central source of stress (cf. Hobfoll, 1989). Images of aging shape developmental goals and the resources (e.g., self-efficacy, time perspective outcome expectancies) used to achieve those goals. Furthermore, images of aging affect individuals’ access as well as attraction to external contexts differentially supportive of positive development (e.g., work contexts via the relationship between images of aging and turnover intentions).

The effects of images of aging (acute as well as developmental) need to be considered as a person-context interaction. Throughout the dissertation, I have emphasized the importance of considering how images of aging affect acute outcomes as well as development from a person by context perspective. For example, the analysis in Chapter 10 demonstrated that supervisors’ ‘positive’ images of aging are not necessarily motivating: Whether or not other people’s (e.g., supervisors’) positive age stereotypes have positive effects depends in part on the individuals’ own aging self-perceptions. Chapter 5 identified several individual factors that moderate how contextual reminders of an age stereotype affect immediate functioning.

Images of aging in the work context have important implications for individual development as well as for organizations. The dissertation underlines the importance for not only individuals, but also organizations to pay attention to images of aging within the work

context. Pervasive negative perceptions of older workers' performance, capabilities and motivation (e.g., Posthuma & Campion, 2009) and working adults' perceptions of these older worker stereotypes are related to the plasticity of working adults' development (e.g., by being related to promotion orientation, selection to work contexts) which in turn affects adults' ability and motivation to contribute to the work context. Images of aging in the work context are also related to the achievement of organizational goals (e.g., reducing turnover). This dissertation has provided concrete, empirical examples and a theoretical backbone for the claim that negative older worker stereotypes hinder the achievement of societal and organizational goals to increase older adults' productivity within the work context (cf. Eurolink Age, 2000).

Can We Change Images of Aging?

Given the important influences of images of aging on adult development such as those suggested by the two empirical studies, one would like to know if and how active intervention can change contextual and individual images of aging in a more positive (though still realistic) direction. It has long been recognized that images of aging are not fixed. Aging and old age are cultural categories, which are subject to the possibility of re-construction (e.g., Hockey & James, 2003). Indeed, cultural differences as well as historical shifts in images of aging have been well documented within the literature (e.g., Ehmer & Höffe, 2009). It will be interesting to observe whether and how demographic changes and the policy changes that accompany the aging of the population (e.g., policies to extend working lives) will affect societal images of aging. In fact, the general public expects the image of aging to change in the next years: According to a recent German study, more than half of a sample of the general German population expects the image of aging to change either somewhat (39%) or extremely (15%) within the next 5 to 10 years (Robert Bosch Stiftung, 2009).

Are images of aging a product of changing times, or can they be purposefully changed? Some government policies have already begun attempts to purposefully change images of aging. For instance, government-funded programs in Denmark and Victoria,

Australia have begun explicit campaigns to change current (negative) images of aging. The United Nations Programme on Aging also targets images of aging (e.g., stereotypes, media images) as one of four critical aspects of the Madrid International Plan of Action on Aging (2002). In Victoria, Australia the government provided \$50,000 to promote positive images of older men and women that celebrated their continuing contribution to social life as opposed to their maintained youthful external appearance (cited in Featherstone & Hepworth, 2005). Still, the effectiveness of such measures in terms of changing people's images of aging is unknown. Likewise, images of aging in the media are often cited as a source of the images of aging in society. However, there is little empirical research that has demonstrated a causal link between media consumption and images of aging, and the relationship between media images of aging and individuals' own images of aging is most certainly complex and bi-directional (Kessler, 2009).

There can be no doubt that images of aging at least in part stem from the objective resources and opportunities available across the life course and especially for older people. Reflective of this claim is the relationship between income and education with aging self-perceptions: People with higher income and more education tend to experience the process of aging less in terms of physical decline and social losses and more in terms of continuous growth (Steverink et al., 2001). The relationship between socioeconomic status and aging self-perceptions suggest that 'hard' factors like economic resources and opportunities (e.g., in the work context) play an important role in shaping people's images of aging. In a related vein, Matilda Riley and colleagues have argued that society is characterized by a *structural lag*, such that the dynamism of aging has been outrunning the dynamism of structural change. Hence, she argues that there is currently a lack of opportunity for older adults to engage in meaningful roles that allow them to express their full potential (Riley & Riley, 1994). Likewise, people's images of aging may be affected by this lack of opportunity to meaningfully engage in society.

Age-integrated contexts can also have an effect on images of aging through intergenerational contact. Images of aging are less negative among individuals who have

high levels of knowledge about aging, frequent exposure and interactions with older adults and are able to assume the perspective of an older adult (Hess, 2006). The relationship between general and personal knowledge of aging and images of aging suggest that interventions to increase knowledge of aging and/or contact with older people may affect individuals' images of aging. Applied educational research has investigated the effect of intergenerational contact between young and old as a possible means to change participants' images of aging (see Meshel & McGlynn, 2004 for a review). These interventions are built upon the logic of the contact hypothesis, such that contact between people from stereotyped groups with equal status and a common goal can reduce prejudices (e.g., Allport, 1954). Indeed, experimental studies suggest that prior intergenerational contact can shield older adults from the negative effects of an activated negative age stereotype (Abrams et al., 2006; Abrams et al., 2008). Prior intergenerational contact appears to make confrontation with a negative age stereotype less threatening. However, intergenerational intervention research has generally lacked methodological rigor (e.g., small samples sizes, invalidated instruments) as well as a theoretical backbone (Kessler & Staudinger, 2007). It is thus unsurprising that results of intergenerational contact programs have been somewhat mixed with regards to changing participants' images of aging, as many intervention programs failed to ensure that the appropriate boundary conditions (e.g., equal status, common goal) were part of the contact intervention. In order for intergenerational contact to change people's images of aging, interaction partners need to be exposed to evidence that disconfirms their stereotypes. This may not necessarily happen when younger and older interaction partners are compared along the same dimensions (e.g., speed). Contexts in which older people can take on an expert role that exemplifies some of the positive sides of aging should be more effective in changing people's images of aging. An experimental study (with dependent variables other than images of aging) showed that the positive effects of intergenerational exchange were limited to intergenerational pairs in which the older person had an expert role (Kessler & Staudinger, 2007). Providing interaction partners with mastery training with regards to how to profit from an (intergenerational)

context might also increase the effectiveness of any interventions (cf. Mühlig-Versen & Staudinger, 2010). In particular, such training might help people to better take advantage of work place diversity, in which intergenerational exchanges (albeit generally between members of adjacent generations, as opposed to grandparent-grandchild intergenerational exchanges which have generally been the focal point in past research) can take place.

This dissertation has suggested that organizations can also play a role in shaping the images of aging in the work context. As previously mentioned, preliminary associations between organizational age climate and organizational policies and practices with regards to further education, hiring of older workers and health management among other domains (Noack & Staudinger, 2010) suggest that the image of aging within organizations can be manipulated by implementing certain human resource policies. In addition, interventions targeting supervisors' and other key organizational leaders that improve their knowledge of aging may help not only to improve their images of aging (in terms of making them more positive), but also their understanding of the limitations some people may experience with aging. Still, at least older worker meta-stereotypes seem to be mostly an individual-level variable. This seems to suggest that company-level variables like training or health care policies are not enough on their own. Direct communication, feedback and encouragement that directly target *individuals* and their subjective perceptions are needed. Perhaps most importantly, such communication about age- and development-related topics might help to stimulate discussion on aging and images of aging among colleagues who are aging together. Talking about aging and development might have positive effects in of itself as long-term perspectives, expectations and goals are clarified, especially for younger adults who rarely think about old age or aging. A recent survey found that 74% of German 16 to 29 year olds think 'seldom' or 'never' about old age and getting older (compared with 47% of 30 to 44 year olds and 65% of 45 to 59 year olds; Robert Bosch Stiftung, 2009). Thinking and talking about aging, especially at a relatively young age, can help individuals to clarify their long-term goals, develop a more expansive future time perspective as well as develop proactive coping strategies. Furthermore, talking openly about aging and development may

help younger people approach older adults in such way as to be able to gain from their experience and for older adults to act in generative ways and be integrated in intergenerational networks. This is true within the work context as well as outside of the work context. In sum, developing positive images of aging within the work context is not something just for older workers, or something for companies with an older workforce to consider. Fostering images of aging is an important part of setting up even young adults for positive developmental trajectories. Organizations thus need to focus on creating “development friendly” work environments across the life span, as opposed to interventions (e.g., to change employees’ images of aging) that target employees only once they have reached a certain (advanced) age (Staudinger, 2007; Staudinger, Roßnagel, & Voelpel, 2008).

In sum, it seems that images of aging can be changed by providing real opportunities for continual growth—and the resources that individuals need to profit from such opportunities. Intergenerational exchange, under certain conditions, also seems to foster more positive images of aging. Finally, it seems that organizations can also take specific actions to foster positive images of aging in the work context. Importantly, I suggest that greater recognition and communication with regards to the plasticity and *individual* nature of the aging process and images of aging might do more to change people’s images of aging than anything else.

As a final note, I would once again like to emphasize the importance of fostering *balanced* images of aging. The positive effects of positive images of aging that I have discussed in this dissertation should not be misunderstood as a plea to foster overly positive images of aging that ignore the limitations and losses associated with the aging process. One-sidedly positive images of aging may leave people unprepared to flexibly adapt to missed opportunities, failed goals and the losses that accompany aging (and life in general). Furthermore, unrealistically positive images of aging can evoke disgust when someone fails to live up to this ideal picture, which in turn may result in social exclusion and blame.

Suggestions for Future Research

As is usually the case, the dissertation has opened up a slew of new questions and research ideas that could not be answered by the current work. Three ideas for future research are presented here.

Possible moderators of older worker meta-stereotypes: Saliency and self-relevance.

As mentioned in Chapter 2, the current operationalization of older worker meta-stereotypes is a measure of the overall *positivity* of individuals' older worker meta-stereotypes as opposed to a measure of either the content or saliency of the meta-stereotype. In line with the argumentation in Chapter 5, it is likely that personal characteristics, including the extent to which age and age meta-stereotypes are salient within in the work context as well as the perceived self-relevance of older worker meta-stereotypes likely moderate any effects of older worker meta-stereotypes. Unfortunately, we did not have measures of either saliency or self-relevance in the current empirical work. Future research may profit from including such measures along with measures of older worker meta-stereotypes.

The saliency of the meta-stereotype, or a meta-stereotype positivity (current operationalization) by saliency interaction, may have stronger effects on employees' behavior and attitudes than the positivity of the meta-stereotype alone. The saliency of the age meta-stereotypes could be measured with a complete-the-word task. For instance, employees could be instructed to imagine a situation in which their work or their potential was being evaluated either by colleagues or their supervisor (meta-stereotypes are most likely to be activated in evaluative situations, Vorauer, Hunter, Main, & Roy, 2000). Employees would then be presented with a list of letter combinations and asked to fill in letters in such a way as to form a word. The letter combinations would be designed in such a way such that they could either be completed as words associated with age and age stereotypes or non-age related words (e.g., O_D could be completed as ODD or OLD, SL__ could be completed as SLOW or SLEEP). The number of age or age stereotype-related completions could then be used as a measure of saliency of an age meta-stereotype. It would be interesting to both compare the current older worker meta-stereotype measure with

such a measure as well as to investigate the effects of the interaction between positivity and saliency measures on employees' attitudes and behavior.

The current work did not include a measure of self-relevance such as subjective identity as an older worker, which may be an important moderator of the effects of older worker meta-stereotypes or supervisor aging self-perceptions (see Chapter 5). An alternative approach would be to measure *stigma consciousness* (Pinel, 1999) that is, the extent to which people feel that they are targeted by (negative) stereotypes (in this case, as an older worker). It is likely that inclusion of such a measure of older worker stereotypes self-relevance would be helpful to pinpoint who and how images of aging in the work context affect working adults.

Formation of images of aging in adulthood. As already mentioned, our cross-sectional study limits our ability to observe the interplay between and the development of people's images of aging. This is a promising area for future research. To date, little research has been devoted to how people form their generalized age stereotypes past childhood. Images of aging in the work context, as one of the central contexts of adult life, are a likely source of influence on how adults' images of aging change and develop. Longitudinal studies (Levy, 2008; Rothermund, 2005; Rothermund & Brandtstädter, 2003) convincingly suggest that endorsement of (negative) age stereotypes has a causal effect on later self-views of aging as one starts to self-define as old. The images of aging in the work context might particularly contaminate the aging self-perceptions of younger adults as they begin to form ideas about what working life is like and career goals take on a more concrete form. Furthermore, the dynamic interplay between individuals' images of aging and features of their work context (e.g., stress, physical strain, promotion opportunities, satisfaction, older worker meta-stereotypes and age climate) would be an interesting avenue for future research.

Another open question is how older worker meta-stereotypes specific to the work team or organization are formed. What 'harder' factors (e.g., policies, practices, behaviors) within the work context influence individuals' older worker meta-stereotypes_{WC}? The PACS could

be compared with a second scale with items on the perception of age-related policies, practices, and behaviors (e.g., 'In my company, older employees' (a) '...are often offered trainings', (b) '...are often recruited', (c) '...are often promoted') (Noack, 2009). Alternatively, open-ended questions that ask people to describe the image of aging within their work and their reasons for thinking that way might be useful for helping companies to identify the causes of negative (or positive) older worker meta-stereotypes in the work context, as well as identify concrete points for intervention. However, people may not be consciously aware of how they form their older worker meta-stereotypes_{WC}. This may be particularly true for younger adults, given indications that the majority of young adults rarely think of old age or the aging process (Robert Bosch Stiftung, 2009). Younger adults may therefore process signals of the age climate less consciously than older adults (cf. Levy, 2009).

Older worker meta-stereotypes and age diversity. The potential benefits, as well as potential disadvantages, of age diverse organizations and work teams have received considerable attention in the work and aging literature. Age diverse workplaces and teams are thought to create contexts in which the strengths of older employees (e.g., greater experience) can complement the strengths of younger employees (e.g., faster fluid abilities) to yield higher productivity. Age diversity in the work place can also create a context in which older employees can act on their motivation to integrate existing knowledge and share their experience with younger employees with psychological benefits for both mentor as well as mentee (cf. Kessler & Staudinger, 2007), not to mention increased work motivation and organizational commitment. In practice, age diversity does not always (or only) have positive effects. A literature review found that groups with higher variation in their age composition (independent of tenure diversity) have slightly lower levels of group efficiency (i.e., takes longer to make decisions) than more age-homogenous groups, but an overall advantage in performance (Williams & O'Reilly, 1998). However, the literature review also suggested that age diversity is associated with increased turnover and withdrawal, especially of those individuals who are the most different. In sum, there is no clear cut relationship between diversity and either performance or more emotionally-based work outcomes (e.g.,

organizational commitment). Many factors seem to moderate these relationships. It seems reasonable to argue that older worker meta-stereotypes, as a measure of individuals' perceptions of the kind of respectful, age-friendly environment on which intergenerational interactions can take place equal footing, may be one moderator of the effects of age diversity on work-related outcomes. Given the potential benefits of intergenerational interactions, both within the work context and more generally, this would seem to be another promising area for future research.

Contributions of the Dissertation

This dissertation extends previous theoretical considerations of the effects of images of aging by (a) offering a theoretical backbone for how images of aging affect acute functionality and developmental trajectories that draws on both the developmental and social psychological literatures and (b) considering the effects of images of aging from both organizational as well as developmental perspectives. Furthermore, the dissertation extends empirical work on images of aging by (c) simultaneously testing the effect of multiple images of aging, including supervisors' aging self-perceptions, individual aging self-perceptions, as well as age meta-stereotypes and (d) testing the effects of age stereotypes in a (highly relevant) field (i.e., the work context) as opposed to a laboratory setting. While the survey, cross-sectional nature of the data set limits our ability to draw conclusions about causality, there are certain advantages of our empirical approach that make an important contribution to the literature. In real life, people can to certain extents exercise choice about the kind of contexts they enter and exit. Experimental paradigms generally deny participants the opportunity to select the contextual influences (i.e., condition) to which they will be exposed. Such experiments are not well equipped to investigate how images of aging affect selection processes by which people are exposed to certain contexts, which in turn are a major determinant of developmental outcomes. Finally, this dissertation (e) adds to the growing body of research which implicates the important role of features of the work context (i.e., older worker meta-stereotypes, supervisors' aging self-perceptions) in adult development,

and more specifically, (f) extends previous work on the older worker meta-stereotype construct and operationalization, by demonstrating further evidence of the construct validity and meaningfulness of the construct.

Concluding Remarks

Through theoretical and empirical analysis, this dissertation has demonstrated that images of aging are related to the plasticity of adult development. Our ideas about what is possible (and desirable) across the life span, but also our resources (biological, cultural, psychological) for getting there to a great extent determine the range of possibilities for how we actually function and develop. Our own and other peoples' images of aging, as pictures of what is possible, probable and desirable with increasing age play an influential role in determining who we actually become. Images of aging are therefore deserving of a bigger research focus across social psychological, sociological, developmental, and also organizational domains. More generally, while aging is a topic that most people do their best to ignore, this dissertation suggests that images of aging deserve more thought and discussion in our daily lives than seems to be currently the case. It is my hope that this dissertation has and will stimulate such discussion, both scientifically and socially.

References

- Abrams, D., Crisp, R. J., Marques, S., Fagg, E., Bedford, L., & Provias, D. (2008). Threat inoculation: Experienced and imagined intergenerational contact prevents stereotype threat effects on older people's math performance. *Psychology and Aging, 23*(4), 934-939.
- Abrams, D., Eilola, T., & Swift, H. (2009). Attitudes to age in Britain 2004-08. *Report for the Centre for the Study of Group Processes*. Department of Psychology, University of Kent. Norwich, UK: Crown. Retrieved from <http://research.dwp.gov.uk/asd/asd5/rports2009-2010/rrep599.pdf>.
- Abrams, D., Eller, A., & Bryant, J. (2006). An age apart: The effects of intergenerational contact and stereotype threat on performance and intergroup bias. *Psychology and Aging, 21*(4), 691-702.
- Adorno, T. W., Frenkel-Brunswik, E., Levinson, D. J., & Sanford, R. N. (1950). *The authoritarian personality*. New York: Harper and Row.
- Ai, C., & Norton, E. C. (2003) Interaction terms in logit and probit models. *Economics Letters, 80*(1), 123-129.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of Occupational Psychology, 63*, 1-8.
- Allport, G. (1954). *The nature of prejudice*, Reading, MA: Addison-Wesley
- Anderson, N. R., & West, M. A. (1998). Measuring climate for work group innovation: Development and validation of the team climate inventory. *Journal of Organizational Behavior, 19*, 235-258.

- Andreoletti, C., & Lachman, M. E. (2004). Susceptibility and resilience to memory aging stereotypes: Education matters more than age. *Experimental Aging Research, 30*, 129-148.
- Andreoletti, C., Veratti, B. W., & Lachman, M. E. (2006). Age differences in the relationship between anxiety and recall. *Aging and Mental Health, 10*(3), 265-271.
- Aronson, J., Lustina, M., Good, C., Keough, K., Steele, C., & Brown, J. (1999). When white men can't do math: Necessary and sufficient factors in stereotype threat. *Journal of Experimental Social Psychology, 35*, 29-46.
- Aronson, J., Quinn, D. M., & Spencer, S. J. (1998). Stereotype threat and the academic underperformance of minorities and women. In C. Stangor & J. Swim (Eds.), *Prejudice: The target's perspective* (pp. 83-103). Orlando, FL: Academic.
- Auman, C., Bosworth, H. B., & Hess, T. M. (2005). Effect of health-related stereotypes on physiological responses of hypertensive middle-aged and older men. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 60*, 3-10.
- Avramova, Y., & Stapel, D. (2008). Moods as spotlights: The influence of mood on accessibility effects. *Journal of Personality and Social Psychology, 95*(3), 542-554.
- Baltes, M. M., & Wahl, H.-W. (1992). The dependency-support script in institutions: Generalization to community settings. *Psychology and Aging, 7*, 409-418.
- Baltes, P. B. (1987). Theoretical propositions of lifespan developmental psychology: On the dynamics between growth and decline. *Developmental Psychology, 23*, 611-626.
- Baltes, P. B., & Baltes, M. M. (1990). Psychological perspectives on successful aging: The model of selective optimization with compensation. In P. B. Baltes & M. M. Baltes (Eds.), *Successful aging: Perspectives from the behavioral sciences* (pp. 1-34). Cambridge, England: Cambridge University Press.
- Baltes, P. B., & Nesselroade, J. R. (1970). Multivariate longitudinal and cross-sectional sequences for analyzing ontogenetic and generational change: A methodological note. *Developmental Psychology, 2*, 163-168.

- Baltes, P. B., Lindenberger, U., & Staudinger, U. M. (2006). Life-span theory in Developmental Psychology. In R. M. Lerner (Ed.), *Handbook of child psychology: Vol. 1. Theoretical models of Human Development* (6th ed., pp. 569-664). New York: Wiley.
- Baltes, P. B., Reese, H. W., & Lipsitt, L. P. (1980). Life-span Developmental Psychology. *Annual Review of Psychology*, 31, 65-110.
- Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology*, 71, 230-244.
- Bargh, J.A. (1996). Automaticity in social psychology. In E.T. Higgins and A.W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 169 – 183). New York: Guilford Press.
- Bartko, J. J. (1966). The intraclass correlation coefficient as a measure of reliability. *Psychological Reports*, 19, 3-11.
- Bartko, J. J. (1976). On various intraclass correlation reliability coefficients. *Psychological Bulletin*, 83, 762-765.
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, 5, 323-370.
- Baumeister, R. F. (1998). The self. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology* (Vol. 1, pp. 680-740). Boston, MA: McGraw-Hill.
- Bellmann, L. (2002). Das IAB Betriebspanel: Konzeption und Anwendungsbereiche [Institute for Employment Research Establishment Panel: Conception and Application]. *Allgemeines Statistisches Archiv*, 86, 177-188.
- Biemann, T., & Heidemeier, H. (2010). On the usefulness of the ICC(1) and r_{WG} index to justify aggregation decisions. Best Paper Proceedings of the Academy of Management Annual Meeting, August 6-10, Montreal, Canada.
- Blasovich, J., Spencer, S. J., Quinn, D., & Steele, C. (2001). African Americans and high blood pressure: The role of stereotype threat. *Psychological Science*, 12, 225-229.

- Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 349-381). San Francisco, CA: Jossey.
- Bodenhausen, G. V., Kramer, G. P., & Süsser, K. (1994). Happiness and stereotypic thinking in social judgment. *Journal of Personality and Social Psychology*, 66, 621-632.
- Bosson, J. K., Haymovitz, E. L., & Pinel, E. C. (2004). When saying and doing diverge: The effects of stereotype threat on self-reported versus non-verbal anxiety. *Journal of Experimental Social Psychology*, 40, 247-255.
- Bowen, C. E., Noack, C. M. G., & Staudinger, U. M. (in press). Aging in the work context. In K.W Schaie & S. Willis (Eds.), *Handbook of the Psychology of Aging* (7th ed.). San Diego, CA: Elsevier Academic Press.
- Brandtstädter, J. (1998). Action perspectives on human development. In W. Damon (Editor-in-Chief) & R. M. Lerner (Vol. Ed.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (5th ed., pp. 807–866). New York: Wiley.
- Brandtstädter, J. (1999). The self in action and development: Cultural, biosocial, and ontogenetic bases of intentional self-development. In J. Brandtstädter & R.M. Lerner (Eds.), *Action and self-development: Theory and research through the life span* (pp. 37-65). Thousand Oaks, CA: Sage.
- Brandtstädter, J. (2006). Action perspectives on human development. In R.M. Lerner (Ed.), *Handbook of child psychology: Vol. 1. Theoretical models of Human Development* (6th ed., pp. 516-568). New York: Wiley.
- Brandtstädter, J., & Greve, W. (1994). The aging self: Stabilizing and protective processes. *Developmental Review*, 14, 52-80.
- Brandtstädter, J., & Renner, G. (1990). Tenacious goal pursuit and flexible goal adjustment: Explication and age-related analysis of assimilative and accommodative strategies of coping. *Psychology and Aging*, 5, 58-67.

- Brandtstädter, J., & Renner, G. (1992). Coping with discrepancies between aspirations and achievement in adult development: A dual-process model. In L. Montada, S. –H. Filipp, & M. Lerner (Eds.), *Life crises and experiences of loss in adulthood* (pp. 301-319). Hillsdale, NJ: Erlbaum.
- Brandtstädter, J., & Rothermund, K. (2002). Intentional self-development: Exploring the interfaces between development, intentionality, and the self. In L. J. Crockett (Ed.), *Agency, motivation, and the life course* (Nebraska Symposium on Motivation, Vol. 48, pp. 31-75). Lincoln, NE: University of Nebraska Press.
- Brandtstädter, J., & Rothermund, K. (2003). Intentionality and time in human development and aging: Compensation and goal adjustment in changing developmental contexts. In U.M. Staudinger & U. Lindenberger (Eds.), *Understanding human development: Dialogues with lifespan psychology* (pp. 105-124). Boston: Kluwer Academic Publishers.
- Brandtstädter, J., Wentura, D., & Rothermund, K. (1999). Intentional self-development through adulthood and later life: Tenacious pursuit and flexible adjustment of goals. In J. Brandtstädter & R. M. Lerner (Eds.), *Action and self-development: Theory and research through the life span* (pp. 373- 400). Thousand Oaks, CA: Sage.
- Brewer, M. B., & Lui, L. (1984). Categorization of the elderly by the elderly: Effects of the perceiver's category membership. *Personality and Social Psychology Bulletin*, 10(4), 585-595.
- Brewer, M. B., Dull, V., & Lui, L. (1981). Perceptions of the elderly: Stereotypes as prototypes. *Journal of Personality and Social Psychology*, 41, 656-670.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.
- Burke, M. J., & Dunlap, W. P. (2002). Estimating interrater agreement with the average deviation index: A user's guide. *Organizational Research Methods*, 5, 159-172.
- Burke, M. J., Finkelstein, L. M., & Dusig, M. S. (1999). On average deviation indices for estimating interrater agreement. *Organizational Research Methods*, 2, 49-68.

- Butler, R. (1980). Ageism: A foreword. *Journal of Social Issues*, 36, 8-11.
- Byrne, B. (1998). *Structural Equation Modeling with LISREL, PRELIS, and SIMPLIS: Basic applications and programs*. Lawrence Erlbaum, New Jersey.
- Calder, A. J., Keane, J., Manly, T., Sprengelmeyer, R., Scott, S., Nimmo-Smith, I., & Young, A. W. (2003). Facial expression recognition across the adult life span. *Neuropsychologia*, 41, 195-202.
- Canneto, S. S., Kaminski, P. L., & Felicio, D. M. (1995). Typical and optimal aging in women and men: Is there a double standard? *International Journal of Aging and Human Development*, 40(3), 187-207.
- Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist*, 54(3), 165-181.
- Carstensen, L. L., Pasupathi, M., Mayr, U., & Nesselroade, J. R. (2000). Emotional experience in everyday life across the adult life span. *Journal of Personality and Social Psychology*, 79(4), 644-655.
- Carstensen, L. L., & Mikels, J. A. (2005). At the intersection of emotion and cognition: Aging and the positivity effect. *Current Directions in Psychological Science*, 14(3), 117-121.
- Casper, C., Rothermund, K., & Wentura, D. (in press). Automatic stereotype activation is context dependent. *Social Psychology (Special Issue: Malleability of Intergroup Stereotypes and Attitudes: Context, Time, and Culture)*, edited by J. Bosak and A. Diekmann).
- Chan, D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: A typology of composition models. *Journal of Applied Psychology*, 83(2), 234-246.
- Charles, S. T., Mather, M., & Carstensen, L. L. (2003). Aging and emotional memory: The forgettable nature of negative images for older adults. *Journal of Experimental Psychology*, 132(2), 310-324.

- Chasteen, A. L., Bhattacharyya, S., Horhota, M., Tam, R., & Hasher, L. (2005). How feelings of stereotype threat influence older adults' memory performance. *Experimental Aging Research, 31*, 235-260.
- Cheng, S.-T. (2009). Generativity in later life: Perceived respect from younger generations as a determinant of goal disengagement and psychological well-being. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 64*, 45-54.
- Chiu, W., Chan, A., Snape, E., & Redman, T. (2001). Age stereotypes and discriminatory attitudes towards older workers: An East-West comparison. *Human Relations, 54*(5), 101-133.
- CIPD. (February, 2001). *Age discrimination at work: Survey report*. London: CIPD. Retrieved from <http://www.cipd.co.uk/subjects/dvsequ/agedisc/agedisc.htm?lsSrchRes=1>
- Clement, R. W., & Krueger, J. (2002). Social categorization moderates social projection. *Journal of Experimental Social Psychology, 38*, 219-231.
- Compton, D. M., Bachman, L. D., Brand, D., & Avet, T. L. (2000). Age-associated changes in cognitive function in highly educated adults: Emerging myths and realities. *International Journal of Geriatric Psychiatry, 15*, 75-85.
- Cross, S. & Markus, H. (1991). Possible selves across the life span. *Human Development, 34*, 230-255.
- Crowe, E., & Higgins, E. T. (1997). Regulatory focus and strategic inclinations: Promotion and prevention in decision-making. *Organizational Behavior and Human Decision Processes, 69*, 117-132.
- Cunningham, W. A., Raye, C. L., & Johnson, M. K. (2005). Neural correlates of evaluation associated with promotion and prevention regulatory focus. *Cognitive, Affective & Behavioral Neuroscience, 5*(2), 202-211.
- DeLamater, J., & Moorman, S. M., (2007). Sexual behavior in later life. *Journal of Aging and Health, 19*(6), 921-945.

- Desrichard, O., & Kopetz, C. (2005). A threat in the elder: The impact of task instructions, self-efficacy and performance expectations on memory performance in the elderly. *European Journal of Social Psychology, 35*, 537-552.
- Diehl, M., & Wahl, H.-W. (2010). Awareness of age-related change: Examination of a (mostly) unexplored concept. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 65B*, 340-350.
- Dijksterhuis, A., Aarts, H., Bargh, J. A., & van Knippenberg, A. (2000). On the relation between associative strength and automatic behavior. *Journal of Experimental Social Psychology, 36*, 531-544.
- Dijksterhuis, A., Spears, R., & Lépinasse, V. (2001). Reflecting and deflecting stereotypes: Assimilation and contrast in impression formation and automatic behavior. *Journal of Experimental Social Psychology, 37*, 286-299.
- Donlon, M., Ashman, O., & Levy, B. R. (2005). Re-vision of older television characters: A stereotype-awareness intervention. *Journal of Social Issues, 61*, 307–319.
- Ebner, N. C. (2005). Striving for gains and preventing losses: Multi-method evidence on the differences in personal goal orientation in early and late adulthood. Doctoral Dissertation, Free University of Berlin. Retrieved from http://ebnertec.de/natalie.ebner/Dissertation_Ebner_2005.pdf
- Ebner, N. C., Freund, A. M., & Baltes, P. B. (2006). Developmental changes in personal goal orientation from young to late adulthood: From striving for gains to maintenance and prevention of losses. *Psychology and Aging, 21*, 664–678.
- Ebner, N. C., Riediger, M., & Lindenberger, U. (2009). Schema reliance for developmental goals increases from early to late adulthood: Improvement for the young, loss-prevention for the old. *Psychology and Aging, 24*, 310-323.
- Eddington, K. M., Dolcos, F., Cabeza, R., Krishnan, K. R. R., & Strauman, T. J. (2007). Neural correlates of promotion and prevention goal activation: An fMRI study using an idiographic approach. *Journal of Cognitive Neuroscience, 19*, 1152-1162.

- Ehmer, J., & Höffe, O. (Eds.) (2009). Bilder des Alters im Wandel [Changing Images of Aging]. (Vol. 1; J. Kocka & U. M. Staudinger (Eds.), *Altern in Deutschland [Aging in Germany]*. Stuttgart: Wissenschaftliche Verlagsgesellschaft.
- Eisenberger, R., Armeli, S., Rexwinkel, B., Lynch, P. D., & Rhoades, L. (2001). Reciprocation of perceived organizational support. *Journal of Applied Psychology*, 86, 42-51.
- Esler, M., Hasting, J., Lambert, G., Kaye, D., Jennings, G., & Seals, D. R. (2002). The influence of aging on the human sympathetic nervous system and brain norepinephrine turnover. *The American Journal of Physiology - Regulatory, Integrative and Comparative Physiology*, 282, 909–916.
- EuroLink Age. (2000). Ageing in employment: A proposal for a European code of good practice. London: EuroLink Age. Retrieved from <http://www.ec-network.net/equal/usufull%20links/code.pdf>
- Fazio, R. H., Jackson, J. R., Dunton, B. C., & Williams, C. J. (1995). Variability in automatic activation as an unobtrusive measure of racial attitudes: A bona fide pipeline? *Journal of Personality and Social Psychology*, 69, 1013-1027.
- Featherstone, M., & Hepworth, M. (2005). Images of ageing: Cultural representations of later life. In M. Johnson (Ed.), *The Cambridge Handbook of Age and Ageing* (pp. 354-362). Cambridge: Cambridge University Press.
- Ferris, G. R., Yates, V. L., Gilmore, D. C., & Rowland, K. M. (1985). The influences of subordinate age on performance ratings and causal attributions. *Personnel Psychology*, 38, 545-557.
- Filipp, S. H., & Mayer, A. K. (1999). *Bilder des alters-alterstereotype und die beziehungen zwischen den generationen [Images of aging: Age stereotypes and the relationships between generations]*. Stuttgart: Kohlhammer.
- Fiske, S. T. (1998). Stereotyping, prejudice, and discrimination. In D.T. Gilbert, S.T. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology* (4th ed., Vol. 2, pp. 357–411). New York: McGraw-Hill.

- Fiske, S. T., Cuddy, A. J. C., Glick, P. & Xu, J. (2002). A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology*, 82(6), 878-902.
- Freund, A. M. (2008). Successful aging as management of resources: The role of selection, optimization, and compensation. *Research on Human Development*, 5, 94–106.
- Freund, A. M., & Ebner, N. C. (2005). The aging self: Shifting from promoting gains to balancing losses. In W. Greve, K. Rothermund, & D. Wentura (Eds.), *The adaptive self: Personal continuity and intentional self-development* (pp. 185–202). New York: Hogrefe.
- Freund, A. M., & Ritter, J. O. (2009). Midlife crisis: A debate. *Gerontologist*, 55, 582–591.
- Friedman, R. S., & Förster, J. (2001). The effects of promotion and prevention cues on creativity. *Journal of Personality and Social Psychology*, 81, 1001–1013.
- George, J. M. (1990). Personality, affect, and behavior in groups. *Journal of Applied Psychology*, 75, 107-116.
- Gilbert, D. T., & Hixon, J. G. (1991). The trouble of thinking: Activation and application of stereotypic beliefs. *Journal of Personality and Social Psychology*, 60, 509-517.
- Gilleard, P., & Higgs, P. (2000). *Cultures of ageing: Self, citizen, and the body*. Harlow, England: Pearson Education Limited.
- Glick, W. H. (1985). Conceptualizing and measuring organizational and psychological climate: Pitfalls in multilevel research. *Academy of Management Review*, 10, 601-616.
- Gordon, R.A., & Arvey, R. D. (2004). Age bias in laboratory and field settings: A meta-analytic investigation. *Journal of Applied Social Psychology*, 34(3), 468–492.
- Gouldner, A. W. (1960). The norm of reciprocity: A preliminary statement. *American Sociological Review*, 25, 165-170.
- Graham, J. W., & Donaldson, S. W. (1993). Evaluating interventions with differential attrition: The importance of nonresponse mechanisms and use of follow-up data. *Journal of Applied Psychology*, 78, 119-128.

- Greve, W., & Staudinger, U. M. (2006). Resilience in later adulthood and old age: Resources and potentials for successful aging. In D. Cicchetti & A. Cohen (Eds.), *Developmental psychopathology* (2nd ed., pp. 796-840). New York: Wiley.
- Griffeth, R.W., Horn, P.W., Gaertner, S. (2000). A meta-analysis of antecedents and correlates of employee turnover: Update, moderator tests, and research implications for the next millennium. *Journal of Management*, 26(3), 463 – 488.
- Griffin, P., Mroczek, D. K., & Spiro, A. (2006). Variability in affective change among aging men: Findings from the VA Normative Aging Study. *Journal of Research in Personality*, 40, 942-965.
- Gross, J. J., Carstensen, L. L., Pasupathi, M., Tsai, J., Gotestam Skorpen, C., & Hsu, A. Y. (1997). Emotion and aging: Experience, expression, and control. *Psychology and Aging*, 12(4), 590-599.
- Hagestad, G. O., & Uhlenberg, P. (2005). The social separation of old and young: A root of ageism. *Journal of Social Issues*, 61, 343-360.
- Hamilton, D. L., & Sherman, J. W. (1994). Stereotypes. In J. R. S. Wyer and T. K. Srull (Eds.), *Handbook of social cognition* (2nd ed., pp. 1-68). Hillsdale, NJ: Erlbaum.
- Harper, S., Khan, H. T. A., Saxena, A., & Leeson, G. (2006). Attitudes and practices of employers towards ageing workers: Evidence from a global survey on the future of retirement. *Ageing Horizons*, 5, 31-41.
- Harrison, D. A., Price, K. H., Gavin, J. H., & Florey, A. T. (2002). Time, teams, and task performance: Changing effects of diversity on group functioning. *Academy of Management Journal*, 45, 1029-1045.
- Hassell, B. L., & Perrewe, P. L. (1993). An examination of the relationship between older workers' perceptions of age discrimination and employee psychological states. *Journal of Managerial Issues*, 5, 109 –120.
- Hassell, B. L., & Perrewe, P. L. (1995). An examination of beliefs about older workers: Do stereotypes still exist? *Journal of Organizational Behavior*, 16(5), 457-468.

- Hausdorff, J. M., Levy, B. R., & Wei, J. Y. (1999). The power of ageism on physical function of older persons: Reversibility of age-related gait changes. *Journal of the American Geriatrics Society*, 47, 1346-1349.
- Hays, W. L. (1981). *Statistics*. New York: Rinehart and Winston.
- Heckhausen, J. (1997). Developmental regulation across adulthood: Primary and secondary control of age-related changes. *Developmental Psychology*, 33, 176–187.
- Heckhausen, J., & Brim, O. G. (1997). Perceived problems for self and others: Self-protection by social downgrading throughout adulthood. *Psychology and Aging*, 12, 610-619.
- Heckhausen, J., Dixon, R. A., & Baltes, P. B. (1989). Gains and losses in development throughout adulthood as perceived by different adult age groups. *Developmental Psychology*, 25(1), 109-121.
- Heckhausen, J., & Krueger, J. (1993). Developmental expectations for the self and most other people: Age grading in three functions of social comparison. *Developmental Psychology*, 29, 539-548.
- Heckhausen, J., Wrosch, C., & Schulz, R. (2010). A motivational theory of lifespan development. *Psychological Review*, 117, 32-60.
- Heidrich, S. M., & Ryff, C. D. (1993). The role of social comparison processes in the psychological adaptation of elderly adults. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 48, 127-136.
- Hess, T. M. (2005). Memory and aging in context. *Psychological Bulletin*, 131, 383-406.
- Hess, T. M. (2006). Attitudes toward aging and their effects on behavior. In J.E. Birren and K. W. Schaie (Eds.), *Handbook of the psychology of aging* (pp. 379-406). Amsterdam, Boston: Elsevier Academic Press.
- Hess, T. M., & Hinson, J. T. (2006). Age-related variation in the influences of aging stereotypes on memory in adulthood. *Psychology and Aging*, 21(3), 621-625.

- Hess, T. M., Auman, C., Colcombe, S. J., & Rahhal, T. A. (2003). The impact of stereotype threat on age differences in memory performance. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 58, 3-11.
- Hess, T. M., Hinson, J. T., & Statham, J. A. (2004). Implicit and explicit stereotype activation effects on memory: Do age and awareness moderate the impact of priming? *Psychology and Aging*, 19, 495-505.
- Hess, T. M., Hinson, J. T., & Hodges, E. A. (2009). Moderators of and mechanisms underlying stereotype threat effects on older adults' memory performance. *Experimental Aging Research*, 35, 153-177.
- Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist*, 52(12), 1280-1300.
- Higgins, E. T. (1998). Promotion and prevention: Regulatory focus as a motivational principle. *Advances in Experimental Social Psychology*, 30, 1-46.
- Higgins, E. T. (2000). Making a good decision: Value from fit. *American Psychologist*, 55, 1217-1230.
- Higgins, E. T., Bond, R. N., Klein, R., & Strauman, T. (1986). Self-discrepancies and emotional vulnerability: How magnitude, accessibility, and type of discrepancy influence affect. *Journal of Personality and Social Psychology*, 51, 5-15.
- Higgins, E. T., Friedman, R. S., Harlow, R. E., Idson, L. C., Adyuk, O. N., & Taylor, A. (2001). Achievement orientations from subjective histories of success: Promotion vs. prevention pride. *European Journal of Social Psychology*, 31, 3-23.
- Higgins, E. T., Roney, C. J. R., Crowe, E., & Hymes, C. (1994). Ideal vs. ought predilections for approach and avoidance distinct self-regulatory systems. *Journal of Personality and Social Psychology*, 66, 276-286.
- Higgins, E. T., Shah, J. Y., & Friedman, R. (1997). Emotional responses to goal attainment: Strength of regulatory focus as moderator. *Journal of Personality and Social Psychology*, 72, 515-525.

- Higgins, E. T., & Tykocinski, O. (1992). Self-discrepancies and biographical memory: Personality and cognition at the level of psychological situation. *Personality & Social Psychology Bulletin*, 18, 527-535.
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44, 513-524.
- Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing conservation of resources theory. *Applied Psychology: An International Review*, 50, 337-421.
- Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Review of General Psychology*, 6, 307-324.
- Hockey, J., & James, A. (2003). *Social identities across the life course*. Basingstoke: Palgrave Macmillan.
- Hofmann, W., Gschwendner, T., Wiers, R., Friese, M., & Schmitt, M. (2008). Working memory capacity and self-regulation: Towards an individual differences perspective on behavior determination by automatic versus controlled processes. *Journal of Personality and Social Psychology*, 95, 962-977.
- Hogan, M. J. (2003). Divided attention in older but not younger adults is impaired by anxiety. *Experimental Aging Research*, 29, 111-136.
- Hogan, R., & Roberts, B. W. (2004). A socioanalytic model of maturity. *Journal of Career Assessment*, 12, 207-217.
- Hom, P., & Kinicki, A. (2001). Towards a greater understanding of how dissatisfaction drives employee turnover. *Academy of Management Journal*, 44, 975-987.
- Horton, S., Baker, J., Pearce, G. W., & Deakin, J. M. (2008). On the malleability of performance: Implications for seniors. *Journal of Applied Gerontology*, 27, 446-465.
- Hox, J. J. (2002). *Multilevel Analysis: Techniques and applications*. Mahwah, NJ: Lawrence Erlbaum Associates.

- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55.
- Huang, X., & Lun, J. (2006). The impact of subordinate-supervisor similarity in growth-need strength on work outcomes: The mediating role of perceived similarity. *Journal of Organizational Behavior*, 27, 1121-1148.
- Hummert, M. L. (1990). Multiple stereotypes of the elderly and young adults: A comparison of structure and evaluations. *Psychology and Aging*, 5(2), 182-193.
- Hummert, M. L., Garstka, T. A., Shaner, J. L., & Strahm, S. (1994). Stereotypes of the elderly held by young, middle-aged, and elderly adults. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 49, 240-249.
- Hummert, M. L., Gartska, T. A., O'Brien, L. T., Greenwald, A. G., & Mellott, D. S. (2002). Using the Implicit Association Test to measure age differences in implicit social cognitions. *Psychology and Aging*, 17(3), 482-495.
- Ickes, W., Snyder, M., & Garcia, S. (1997). Personality influences on the choice of situations. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 165-195). San Diego, CA: Academic Press.
- Idson, L. C., Liberman, N., & Higgins, E. T. (2000). Distinguishing gains from nonlosses and losses from nongains: A regulatory focus perspective on hedonic intensity. *Journal of Experimental Social Psychology*, 36, 252-274.
- James, L. R. (1982). Aggregation bias in estimates of perceptual agreement. *Journal of Applied Psychology*, 67, 219–229.
- James, L. R., Demaree, R. G., & Wolf, G. (1993). r_{wg} : An assessment of within-group interrater agreement. *Journal of Applied Psychology*, 78, 306-309.
- James, W. (1890/1948). *Psychology: Briefer Course*. New York: Henry Holt & Company.
- Johns, M.J., Inzlicht, M., & Schmader, T. (2008). Stereotype threat and executive resource depletion: Examining the influence of emotion regulation. *Journal of Experimental Psychology: General*, 137(4), 691-705.

- Jones, A. P., & James, L. R. (1979). Psychological climate: Dimensions and relationships of individual and aggregated work environment perceptions. *Organizational Behavior & Human Performance*, 23(2), 201-250.
- Jopp, D., & Rott, C. (2006). Adaptation in very old age: Exploring the role of resources, beliefs, and attitudes for centenarians' happiness. *Psychology and Aging*, 21(2), 266-280.
- Jöreskog, K.G., & Sörbom, D. (2006). *LISREL 8.80 for Windows [Computer software]*. Lincolnwood, IL: Scientific Software International, Inc.
- Judd, C. M., Park, B., Yzerbyt, V., Gordijn, E., & Muller, D. (2005). Attributions of intergroup bias and outgroup homogeneity to ingroup and outgroup others. *European Journal of Social Psychology*, 35, 677-704.
- Jussim, L., & Harber, K.D. (2005). Teacher expectations and self-fulfilling prophecies: Knowns and unknowns, resolved and unresolved controversies. *Personality and Social Psychology Review*, 9, 131–155.
- Kail, R. V., & Cavanaugh, J. C. (2007). *Human development: A life-span view* (4th ed.). Belmont, CA: Wadsworth.
- Kanfer, R., & Ackerman, P. L. (2004). Aging, adult development and work motivation. *Academy of Management Review*, 29(3), 440-458.
- Kensinger, E. A. (2008). Age differences in memory for arousing and nonarousing emotional words. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences*, 63, 13–18.
- Kessler, E.-M. (2009). Altersbilder in den Medien: Wirklichkeit oder Illusion? [Images of aging in the media: Reality or illusion?] In B. Schorb, A. Hartung, W. Reißmann (Eds.), *Medien im höheren Lebensalter. Herausforderungen für Medienwissenschaft und Medienpädagogik [Media in advanced age: Challenges for Media Studies.]*. Wiesbaden: VS Verlag für Sozialwissenschaften.

- Kessler, E.-M., Rakoczy, K., & Staudinger, U. M. (2004). The portrayal of older people in prime time television series: The match with gerontological evidence. *Ageing & Society*, 24(4), 531-552.
- Kessler, E.-M., Schwender, C., & Bowen, C. (2010). The portrayal of older people's social participation on German prime-time TV advertisements. *Journals of Gerontology: Social Sciences*, 65B(1), 97 - 106.
- Kessler, E.-M., & Staudinger, U. M. (2006). Plasticity in old age: Micro and macro perspectives on social contexts. In H. W. Wahl, C. Tesch-Römer & A. Hoff (Eds.), *Emergence of new person-environment dynamics in old age: A multidisciplinary exploration* (pp. 263-283). Amityville, NY: Baywood.
- Kessler, E.-M., & Staudinger, U. M. (2007). Intergenerational potential: Effects of social interaction between older adults and adolescents. *Psychology and Aging*, 22, 690-704.
- Kessler, E.-M., & Staudinger, U. M. (2009). Affective experience in adulthood and old age: The role of affective arousal and perceived affect regulation. *Psychology and Aging*, 24, 349-362.
- Kiecolt-Glaser, J. K., McGuire, L., Robles, T., & Glaser, R. (2002). Emotions, morbidity, and mortality: New perspectives from psychoneuroimmunology. *Annual Review of Psychology*, 53, 83-107.
- Kinnevy, S., & Morrow-Howell, N. (1999). Perceived benefits of intergenerational tutoring. *Journals of Gerontology and Geriatrics Education*, 20(2), 3-18.
- Kirkwood, T. B. L. (2003). Age differences in evolutionary selection benefits. In U.M. Staudinger & U. Lindenberger (Eds.), *Understanding human development: Dialogues with lifespan psychology* (pp. 45-57). Boston: Kluwer Academic Publishers.
- Kite, M. E., Deaux, K., & Miele, M. (1991). Stereotypes of old and young: Does age outweigh gender? *Psychology and Aging*, 6, 19-27.
- Kite, M. E., & Johnson, B.T. (1988). Attitudes towards younger and older adults: A meta-analysis. *Psychology and Aging*, 3(3), 233-244.

- Kite, M. E., Stockdale, G. D., Whitley, B. E., & Johnson, B. T. (2005). Attitudes toward younger and older adults: An updated meta-analytic review. *Journal of Social Issues*, 61(2), 241 – 266.
- Kossek, E. E., & Zonia, S. (1993). Assessing diversity climate: A field study of reactions to employer efforts to promote diversity. *Journal of Organizational Behavior*, 14, 61-81.
- Kotter-Grühn, D., Kleinspehn-Ammerlahn, A., Gerstorf, D., & Smith, J. (2009). Self-perceptions of aging predict mortality and change with approaching death: 16-year longitudinal results from the Berlin Aging Study. *Psychology and Aging*, 24, 654-667.
- Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individuals' fit at work: A meta-analysis of person–job, person–organization, person–group, and person–supervisor fit. *Personnel Psychology*, 58, 281-342.
- Krueger, J. (2000). The projective perception of the social world: A building block of social comparison processes. In J. Suls & L. Wheeler (Eds.), *Handbook of social comparison: Theory and research* (pp. 323–351). New York: Plenum/Kluwer.
- Krueger, J., Heckhausen, J., & Hundertmark, J. (1995). Perceiving middle-aged adults: Effects of stereotype-congruent and incongruent information. *Journals of Gerontology: Psychological Sciences*, 50, 82-93.
- Kunda, Z. (1999). *Social cognition: Making sense of people*. Cambridge, MA: MIT Press.
- Kunzmann, U., Kupperbusch, C. S., & Levenson, R. W. (2005). Behavioral inhibition and amplification during emotional arousal: A comparison of two age groups. *Psychology and Aging*, 20, 144-158.
- Kunzmann, U., Little, T. D., & Smith, J. (2000). Is age-related stability of subjective well-being a paradox? Cross-sectional and longitudinal evidence from the Berlin aging study. *Psychology and Aging*, 15, 511-526.
- Kwan, C. M. L., Love, G. D., Ryff, C. D., & Essex, M. J. (2003). The role of self-enhancing evaluations in a successful life transition. *Psychology and Aging*, 18, 3-12.
- Labouvie-Vief, G., & Medler, M. (2002). Affect optimization and affect complexity: Modes and styles of regulation in adulthood. *Psychology and Aging*, 17(4), 571-588.

- Lachman, M. E. (2004). Development in midlife. *Annual Review of Psychology*, 55, 305-331.
- Lachman, M.E., & Prenda Firth, K.M. (2004). The adaptive value of feeling in control during midlife. In O. G. Brim, C. D. Ryff, & R. Kessler (Eds.), *How healthy are we?: A national study of well-being at midlife* (pp. 320-349). Chicago: University of Chicago Press.
- Lachman, M. E., & Weaver, S. L. (1998). The sense of control as a moderator of social class differences in health and well-being. *Journal of Personality and Social Psychology*, 74, 763-773.
- Lawton, M. P. (1975). The Philadelphia Geriatric Center Morale Scale: A revision. *Gerontology*, 30, 85-89.
- Lawton, M. P., Kleban, M. H., & Dean, J. (1993). Affect and age: Cross-sectional comparisons of structure and prevalence. *Psychology and Aging*, 8, 165-175.
- Leary, M. R., (2007). Motivational and emotional aspects of the self. *Annual Review of Psychology*, 58, 317-344.
- Leary, M. R., & Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 32, pp. 1-62). San Diego, CA: Academic Press.
- Lerner, R. M. (1984). *On the nature of human plasticity*. New York: Cambridge University Press.
- Leventhal, E., A., & Prohaska, T. R. (1986). Age, symptom interpretation and health behavior. *Journal of American Geriatrics Society*, 34, 185-191.
- Levy, B. (1996). Improving memory in old age through implicit self-stereotyping. *Journal of Personality and Social Psychology*, 71, 1092-1107.
- Levy, B. (2000). Handwriting as a reflection of aging stereotypes. *Journal of Geriatric Psychiatry*, 33, 81-94.
- Levy, B. R. (2003). Mind matters: Cognitive and physical effects of aging self-stereotypes. *Journals of Gerontology: Psychological Sciences*, 58B(4), 203-211.

- Levy, B. R. (2008). Rigidity as a predictor of older persons' aging stereotypes and aging self-perceptions. *Social Behavior and Personality*, 36(4), 559-570.
- Levy, B. R. (2009). Stereotype Embodiment: A psychosocial approach to aging. *Current Directions in Psychological Science*, 18, 332-336.
- Levy, B. R., Ashman, O., & Dror, I. (1999-2000). To be or not to be: The effects of aging stereotypes on the will to live. *Omega*, 40, 409-420.
- Levy, B., & Langer, E. (1994). Aging free from negative stereotypes: Successful memory in China and among the American deaf. *Journal of Personality and Social Psychology*, 66, 989-997.
- Levy, B. R., & Leifheit-Limson, E. (2009). The stereotype-matching effect: Greater influence on functioning when age stereotypes correspond to outcomes. *Psychology and Aging*, 24, 230-233.
- Levy, B. R., Hausdorff, J. M., Hencke, R., & Wei, J. Y. (2000). Reducing cardiovascular stress with positive self-stereotypes of aging. *Journals of Gerontology: Psychological Sciences*, 55B, 205-213.
- Levy, B. R., & Myers, L. M. (2004). Preventive health behaviors influenced by self-perceptions of aging. *Preventive Medicine*, 39(3), 625-629.
- Levy, B. R., Ryall, A. L., Pilver, C. E., Sheridan, P. L., Wei, J. Y., & Hausdorff, J. M. (2008). Influence of African American elders' age stereotypes on their cardiovascular response to stress. *Anxiety, Stress & Coping*, 21(1), 85-93.
- Levy, B. R., Slade, M. D., & Gill, T. M. (2006). Hearing decline predicted by elders' stereotypes. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 61, 82-87.
- Levy, B. R., Slade, M. D., Kunkel, S. R., & Kasl, S. V. (2002a). Longevity increased by positive self-perceptions of aging. *Journal of Personality and Social Psychology*, 83, 261-270.

- Levy, B. R., Slade, M., Kunkel, S. & Kasl, S. (2002b). Longitudinal benefit of positive self-perceptions of aging on functioning health. *Journals of Gerontology: Psychological Sciences*, 57B, 409-417.
- Levy, B. R., Slade, M. D., May, J., & Caracciolo E. A. (2006). Physical recovery after acute myocardial infarction: Positive age self-stereotypes as a resource. *International Journal of Aging and Human Development*, 62, 285–301.
- Levy, B. R., Zonderman, A., Slade, M. D., & Ferrucci L. (2009). Negative age stereotypes held earlier in life predict cardiovascular events in later life. *Psychological Science*, 20, 296–298.
- Linden, M., & Kurtz, G. (2009). A randomised controlled experimental study on the influence of patient age on medical decisions in respect to the diagnosis and treatment of depression in the elderly. *Current Gerontology and Geriatrics Research*, 2009, 1-4.
- Löckenhoff, C. E., De Fruyt, F., Terracciano, A., McCrae, R. R., De Bolle, M., & Costa, P. T. Jr. et al. (2009). Perceptions of aging across 26 cultures and their culture-level associates. *Psychology and Aging*, 24, 941-954.
- Lüdtke, O., Trautwein, U., Kunter, M., & Baumert, J. (2006). Reliability and agreement of student ratings of the classroom environment – A reanalysis of TIMSS data. *Learning Environments Research*, 9, 215-230.
- Luethi, M., Meier, B., & Sandi, C. (2009). Stress effects on working memory, explicit memory, and implicit memory for neutral and emotional stimuli in healthy men. *Frontiers of Behavioral Neuroscience*, 2, 1–9.
- Maier, H., & Smith, J. (1999). Psychological predictors of mortality in old age. *Journals of Gerontology: Psychological Sciences*, 54B, 44-54.
- Malhotra, N. K. (1987). Analyzing marketing research data with incomplete information on the dependent variable. *Journal of Marketing Research*, 24, 74-84.
- Markus, H. R., & Nurius, P. (1987). Possible selves: The interface between motivation and the self-concept. In K. Yardley & T. Honess (Eds.), *Self and identity: Psychosocial perspectives* (pp. 157–171). Chichester, UK: Wiley.

- Marsh, A., & Sahin-Dikmen, M. (2002). Discrimination in Europe. London: Policy Studies Institute. Retrieved from http://ec.europa.eu/public_opinion/archives/ebs/ebs_168_Breport_en.pdf
- Marx, D. M., & Stapel, D. A. (2006). It depends on your perspective: The role of self-relevance in stereotype-based underperformance. *Journal of Experimental Social Psychology, 42*, 768-775.
- Mather, M., & Carstensen, L. L. (2003). Aging and attentional biases for emotional faces. *Psychological Science, 14*(5), 409-415.
- Mather, M., & Knight, M. R. (2006). Angry faces get noticed quickly: Threat detection is not impaired among older adults. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 61B*(1), 54-57.
- Maurer, T. J. (2001). Career-relevant learning and development, worker age, and beliefs about self-efficacy for development. *Journal of Management, 27*, 123-140.
- Maurer, T., Andrews, K., & Weiss, E. (2003). Toward understanding and managing stereotypical beliefs about older workers' ability and desire for learning and development. *Research in Personnel and Human Resources Management, 22*, 253-285.
- Maxfield, M. Pyszczynski, T., Kluck, B., Cox, C. R., Greenberg, J., Solomon, S., & Weise, D. (2007). Age-related differences in responses to thoughts of one's own death: Mortality salience and judgments of moral transgressions. *Psychology and Aging, 22*(2), 342-353.
- McAdams, D. P., de St. Aubin, E., & Logan, R. L. (1993). Generativity among young, midlife, and older adults. *Psychology and Aging, 8*(2), 221-230.
- McCann, R. M., Dailey, R. M., Giles, H., & Ota, H. (2005). Beliefs about intergenerational communication across the life span: Middle age and the roles of age stereotyping and respect norms. *Communication Studies, 56*(4), 293-311.
- Mclver, J. P., & Carmines, E. G. (1981). *Unidimensional scaling*. Beverly Hills, CA: Sage.

- McKown, C., & Weinstein, R.S. (2003). The development and consequences of stereotype consciousness in middle childhood. *Child Development, 74*, 498–515.
- Mergler, N. L., & Goldstein, M. D. (1983). Why are there old people? *Human Development, 35*, 172-177.
- Meshel, D. S., & McGlynn, R. P. (2004). Intergenerational contact, attitudes, and stereotypes of adolescents and other people. *Educational Gerontology, 30*, 457-479.
- Mitchell, T. R., & Lee, T. W. (2001). The Unfolding Model of Voluntary Turnover and Job Embeddedness: Foundations for a comprehensive theory of attachment. *Research in Organizational Behavior, 23*, 189-246.
- Montepare, J. M. (2009). Subjective age: Toward a guiding lifespan framework. *International Journal of Behavioral Development, 33*(1), 42-46.
- Moor, C., Zimprich, D., Schmitt, M., & Kliegel, M. (2006). Neuroticism, aging self-perceptions, and subjective health: A mediation model. *International Journal of Aging and Human Development, 63*, 241-257.
- Mroczek, D. K., & Kolarz, C. M. (1998). The effect of age on positive and negative affect: A developmental perspective on happiness. *Journal of Personality and Social Psychology, 75*(5), 1333-1349.
- Mühlig-Versen, A., & Staudinger, U. M. (2010). Can openness to experience be promoted in older adulthood? The importance of personal characteristics and stimulating contextual factors. Manuscript submitted for publication.
- Mussweiler, T. (2003). Comparison processes in social judgment: Mechanisms and consequences. *Psychological Review, 100*, 472-489.
- Muthén, B., Kaplan, D., & Hollis, M. (1987). On structural equation modeling with data that are not missing completely at random. *Psychometrika, 52*, 431-462.
- Neely, J.H., & Keefe, D. E. (1989). Semantic context effects on visual word processing: a hybrid prospective/retrospective processing theory. In: G.H. Bower, (Ed.), *The psychology of learning and motivation: Advances in research and theory* (pp. 207–248). New York: Academic Press.

- Neikrug, S.M. (2003). Worrying about a frightening old age. *Aging and Mental Health*, 7, 326–333.
- Neuberg, S. L., & Newsom, J. T. (1993). Personal Need for Structure: Individual differences in the desire for simple structure. *Journal of Personality and Social Psychology*, 65, 113-131.
- Ng, T. W. H., & Feldman, D. C. (2008). The relationship of age to ten dimensions of job performance. *Journal of Applied Psychology*, 93(2), 392-423.
- Noack, C. M. G. (2009). *Age Climate: Age stereotypes in organizations and older workers*. Doctoral dissertation. Bremen, Germany: Jacobs University Bremen.
- Noack, C. M. G., Baltes, B. & Staudinger, U. M. (2010). Psychological Age Climate and successful aging in the workplace: Adaptiveness of Selection, Optimization, and Compensation strategy use under constrained external resources. Manuscript in preparation.
- Noack, C. M. G., & Staudinger, U. M. (2010). *Assessing successful aging workforce management: Organizational Age Climate*. Manuscript submitted for publication.
- Noack, C. M. G., Bowen, C. E., & Staudinger, U. M. (2009). *Age climate scale PACS-10*. Bremen, Germany: Jacobs Center on Lifelong Learning and Institutional Development, Jacobs University Bremen.
- Noack, C. M. G., Bowen, C.E. & Staudinger, U. M. (2010). *Psychological Age Climate in organizations: Associations with work-related outcomes*. Manuscript in preparation.
- Nosek, B.A., Banaji, M.R., & Greenwald, A.G. (2002). Harvesting implicit group attitudes and beliefs from a demonstration website. *Group Dynamics [Special Issue: Groups and Internet]*, 6, 101-115.
- Nusselder, W. J., Franco, O. H., Peeters, A., & Mackenbach, J. P. (2009). Living healthier for longer: Comparative effects of three heart-healthy behaviors on life expectancy with and without cardiovascular disease. *BMC Public Health*, 9, 487-496. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2813239/pdf/1471-2458-9-487.pdf>

- O'Brien, L. T., & Hummert, M. L. (2006). Memory performance of late middle-aged adults: Contrasting self-stereotyping and stereotype threat accounts of assimilation to age stereotypes. *Social Cognition, 24*(3), 338-358.
- OECD. (2006). Live longer, work longer. Paris: OECD. Retrieved from http://www.oecd.org/document/42/0,3343,en_2649_34747_36104426_1_1_1_1,00.html
- Ogilvie, D. M., Rose, K. M., & Heppen, J. B. (2001). A comparison of personal project motives in three age groups. *Basic and Applied Social Psychology, 23*, 207–215.
- Oldenhuis, H. K. E. (2007). *I know what they think about us: Metaperceptions and intergroup relations*. Doctoral dissertation. Groningen: Rijksuniversiteit Groningen. Retrieved from <http://dissertations.ub.rug.nl/faculties/ppsw/2007/h.k.e.oldenhuis/>
- Orpen, C. (1995). The effects of perceived age discrimination on employee job satisfaction, organizational commitment and job involvement. *Psychology: A Journal of Human Behavior, 32*(3-4), 55-56.
- Otte, C., Hart, S., Neylan, T. C., Marmar, C. R., Yaffe, K., & Mohr, D.C. (2005). A meta-analysis of cortisol response to challenge in human aging: Importance of gender. *Psychoneuroendocrinology, 30*, 80–91.
- Oyserman, D., & Fryberg, S. A. (2006). The possible selves of diverse adolescents: Content and function across gender, race and national origin. In C. Dunkel & J. Kerpelman (Eds.), *Possible selves: Theory, research, and applications* (pp. 17-39). Huntington, NY: Nova.
- Parker, C. P., Baltes, B. B., Young, S. A., Hugg, J. W., Altmann, R. A., Lacost, H. A., & Roberts, J. E. (2003). Relationships between psychological climate perceptions and work outcomes: A meta-analytic review. *Journal of Organizational Behavior, 24*, 389-416.
- Pennington, G. L., & Roese, N. J. (2003). Regulatory focus and temporal perspective. *Journal of Experimental Social Psychology, 39*, 563–576.

- Perdue, C. W., & Gurtman, M. B. (1990). Evidence for the automaticity of ageism. *Journal of Experimental Social Psychology, 26*, 199-216.
- Person, J., Lustig, C., Nelson, J. K., & Reuter-Lorenz, P. A. (2007). Age differences in deactivation: A link to cognitive control? *Journal of Cognitive Neuroscience, 19*(6), 1021-1032.
- Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. *Journal of Personality and Social Psychology, 90*, 751-783.
- Pinel, E. C. (1999). Stigma consciousness: The psychological legacy of social stereotypes. *Journal of Personality and Social Psychology, 76*, 114-128.
- Pinquart, M. (2001). Age differences in positive affect, negative affect, and affect balance in middle and old age. *Journal of Happiness Studies, 2*, 345-405.
- Pinquart, M. (2002). Good news about the effects of bad old-age stereotypes. *Experimental Aging Research, 28*, 317-336.
- Pitt-Catsoupes, M., Smyer, M. A., Matz-Costa, C., & Kane, K. (2007). National Study of Business Strategy and Workforce Development. Chestnut Hill, MA: Center on Aging and Work at Boston College. Retrieved from http://agingandwork.bc.edu/documents/RH04_NationalStudy_03-07_002.pdf
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., & Podsakoff, N.P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*, 879-903.
- Posthuma, R. A., & Campion, M. A. (2009). Age stereotypes in the workplace: Common stereotypes, moderators, and future research directions. *Journal of Management, 35*, 158-188.
- Price, J. L., & Mueller, C. W. (1986). *Handbook of organizational measurement*. Marshfield, MA: Pitman.
- Rahhal, T.A., Hasher, L., & Colcombe, S.J. (2001). Instructional manipulations and age differences in memory: Now you see them, now you don't. *Psychology and Aging, 22*, 533-558.

- Raudenbush, S. W., Bryk, A., & Congdon, R. (2004). *HLM 6: Hierarchical linear and nonlinear modeling [Computer software]*. Chicago: Scientific Software International.
- Reuter-Lorenz, P. A., & Sylvester, C.-Y. C. (2005). The cognitive neuroscience of working memory and aging. In R. Cabeza, L. Nyberg, & D. C. Park (Eds.), *Cognitive neuroscience of aging: Linking cognitive and cerebral aging* (pp. 186–217). London: Oxford University Press.
- Rickabaugh, C. A., & Tomlinson-Keasey, C. (1997). Social and temporal comparisons in adjust to aging. *Basic and Applied Social Psychology*, 19, 307-328.
- Riley, M. W., & Riley, J. Jr. (1994). Age integration and the lives of older people. *The Gerontologist*, 34, 110-115.
- Robert Bosch Stiftung (2009). Altersbild von Journalisten [*Journalists' Images of Aging*]. Stuttgart: Author. Retrieved from <http://www.bosch-stiftung.de/content/language1/html/24772.asp>
- Roberts, B. W., Caspi, A., & Moffitt, T. (2003). Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology*, 84, 582-593.
- Roberts, B. W., Wood, D., & Smith, J. L. (2005). Examining Five-Factor Theory and social investment perspectives on personality trait development. *Journal of Research in Personality*, 39, 166-184.
- Robinson-Whelen, S., & Kiecolt-Glaser, J. (1997). The importance of social versus temporal comparison appraisals among older adults. *Journal of Applied Social Psychology*, 27, 959-966.
- Rosencranz, H. A., & McNevin, T. E. (1969). A factor analysis of attitudes toward the aged. *The Gerontologist*, 9(1), 55-59.
- Rothermund, K. (2005). Effects of age stereotypes on self-views and adaptation. In W. Greve, K. Rothermund & D. Wentura (Eds.), *The adaptive self: Personal continuity and intentional self-development*. Göttingen, Germany: Hogrefe & Huber.

- Rothermund, K., & Brandtstädter, J. (2003). Age stereotypes and self-views in later life: Evaluating rival assumptions. *International Journal of Behavioral Development, 27*, 549-554.
- Rousseau, D. M. (1988). The construction of climate in organizational research. In C. L. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology* (pp. 139-158). Oxford: John Wiley.
- Ryff, C. D., & Essex, M. J. (1992). The interpretation of life experience and well-being: the sample case of relocation. *Psychology and Aging, 7*(4), 507-517.
- Sacco, J. M., Scheu, C. R., Ryan, A. M., & Schmitt, N. (2003). An investigation of race and sex similarity effects in interviews: A multilevel approach to relationship demography. *Journal of Applied Psychology, 88*, 852-865.
- Salthouse, T. A., & Babcock, R. L. (1991). Decomposing adult age differences in working memory. *Developmental Psychology, 27*, 763-776.
- Sarkisian, C. A., Hays, R. D., & Mangione, C. M. (2002). Do older adults expect to age successfully? The association between expectations regarding aging and beliefs regarding healthcare seeking among older adults. *Journal of American Geriatric Society, 50*, 1837– 1843.
- Saucier, M. G. (2004). Midlife and beyond: Issues for aging women. *Journal of Counseling & Development, 82*(4), 420-425.
- Scheibe, S., & Blanchard-Fields, F. (2009). Effects of regulating emotions on cognitive performance: What is costly for young adults is not so costly for older adults. *Psychology and Aging, 24*, 217-223.
- Scheibe, S., & Carstensen, L. L. (2010). Emotional aging: Recent and future trends. *Journals of Gerontology: Psychological Sciences, 65*(B), 135-144.
- Scheier, M. F., & Carver, C. S. (1992). Effects of optimism on psychological and physical well-being: Theoretical overview and empirical update. *Cognitive Therapy and Research, 16*, 201-228.

- Schein, E.H. (2004). *Organizational culture and leadership* (3rd ed.). San Francisco: Jossey-Bass.
- Schelling, H. R., & Martin, M. (2008). Einstellungen zum eigenen Altern: Eine Alters- oder eine Ressourcenfrage? [Attitudes towards own aging: A question of age or resources?]. *Zeitschrift für Gerontologie und Geriatrie*, 41(1), 38-50.
- Schindler, I., & Staudinger, U. M. (2005). Lifespan perspectives on self and personality: The dynamics between the mechanics and pragmatics. In W. Greve, K. Rothermund & D. Wentura (Eds.), *The adaptive self: Personal continuity and intentional self-development*. Göttingen, Germany: Hogrefe/Huber.
- Schmader, T., Forbes, C. E., Zhang, S., & Mendes, W. B. (2009). A meta-cognitive perspective on cognitive deficits experienced in intellectually threatening environments. *Personality and Social Psychology Bulletin*, 35, 584–596.
- Schmader, T., Johns, M., & Forbes, C. (2008). An integrated process model of stereotype threat effects on performance. *Psychological Review*, 115(2), 236-256.
- Schmidt, D. F., & Boland, S. M. (1986). The structure of impressions of older adults: Evidence for multiple stereotypes. *Psychology and Aging*, 1, 255-260.
- Schneider, B. (1975). Organizational climates: An essay. *Personnel Psychology*, 28, 447-479.
- Schneider, B., Salvaggio, A. N., & Subirats, M. (2002). Climate strength: A new direction for climate research. *Journal of Applied Psychology*, 77, 705-716.
- Schooler, C., Mulatu, M. S., & Oates, G. (2004). Occupational self-direction, intellectual functioning, and self-directed orientation in older workers: Findings and implications for individuals and societies. *American Journal of Sociology*, 110(1), 161-197.
- Seibt, B., & Förster, J. (2004). Stereotype threat and performance: How self-stereotypes influence processing by inducing regulatory foci. *Journal of Personality and Social Psychology*, 87(1), 38-56.

- Sheldon, K. M., & Kasser, T. (2001). Getting older, getting better? Personal strivings and personality development across the life-course. *Developmental Psychology*, 37, 491-501.
- Sherman, J. W., Gawronski, B., Gonsalkorale, K., Hugenberg, K., Allen, T. J., & Groom, C. J. (2008). The self-regulation of automatic associations and behavioral impulses. *Psychological Review*, 115(2), 314-335.
- Shiota, M. N., & Levenson, R. W. (2009). Effects of aging on experimentally instructed detached reappraisal, positive reappraisal, and emotional behavior suppression. *Psychology and Aging*, 24(4), 890-900.
- Sigelman, L., & Tuch, S. A. (1997). Meta-stereotypes: Blacks' perceptions of Whites' stereotypes of Blacks. *Public Opinion Quarterly*, 61, 87-101.
- Sontag, S. (1979). The Double Standard of Aging. In Juanita H. Williams (Ed.), *Psychology of Women: Selected Readings* (pp. 462-478). New York: Norton.
- Sousa-Poza, A., & Henneberger, F. (2004). Analyzing job mobility with job turnover intentions: An international comparative study. *Journal of Economic Issues*, 38(1), 113-137.
- Spiegel, S., Grant-Pillow, H., & Higgins, E. T. (2004). How regulatory fit enhances motivational strength during goal pursuit. *European Journal of Social Psychology*, 34, 39-54.
- Staudinger, U. M. (1999). Social cognition and a psychological approach to an art of life. In F. Blanchard-Fields & T. Hess (Eds.), *Social cognition and aging* (pp. 343-375). New York: Academic Press.
- Staudinger, U. M. (2007). Dynamisches Personalmanagement als eine Antwort auf den demographischen Wandel [Dynamic personnel management as an answer to demographic change]. In *Demographischer Wandel als unternehmerische Herausforderung [Demographic change as an organizational challenge]*. Report from the 60th German Conference on Business Administration (pp. 35-48). Stuttgart: Schäffer-Poeschel.

- Staudinger, U. M. (2008). Produktives Leben im Alter [Productive living in advanced age]. In F. Petermann & W. Schneider (Eds.), *Enzyklopädie der Psychologie [Encyclopedia of Psychology]*, Vol. 7 (pp. 885-915). Göttingen, Germany: Hogrefe.
- Staudinger, U.M., & Lindenberger, U. (2003). Why read another book on human development? Understanding human development takes a meta-theory and multiple disciplines. In U. M. Staudinger & U. Lindenberger (Eds.), *Understanding human development: Dialogues with lifespan psychology (1-13)*. Boston: Kluwer Academic Publishers.
- Staudinger, U. M., Marsiske, M., & Baltes, P. B. (1995). Resilience and reserve capacity in later adulthood: Potential and limits of development across the life span. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology, Vol. 2: Risk, disorder, and adaptation* (pp. 801-947). New York: Wiley.
- Staudinger, U. M., Roßnagel, C., & Voelpel, S. (2008). Strategische Personalentwicklung und demographischer Wandel: eine interdisziplinäre Perspektive [Strategic personnel development and demographic development: An interdisciplinary perspective]. In K. Schwuchow & J. Gutmann (Eds.), *Jahrbuch Personalentwicklung 2008 - Ausbildung, Weiterbildung, Management Development [Yearbook of Personnel Development 2008: Education, Further training and Management Development]* (pp. 295-304). München: Luchterhand.
- Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist*, 52, 613-629.
- Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, 69, 797-811.
- Steele, C. M., Spencer, S. J., & Aronson, J. (2002). Contending with group image: The psychology of stereotype and social identity threat. In M. Zanna, (Ed.), *Advances in experimental social psychology* (Vol. 34, pp. 379–440). New York: Academic Press.

- Stein, R., Blanchard-Fields, F., & Herzog, C. (2002). The effects of age-stereotype priming on the memory performance of older adults. *Experimental Aging Research*, 28, 169-181.
- Steverink, N., Westerhof, G. J., Bode, C., & Dittmann-Kohli, F. (2001). The personal experience of aging, individual resources, and subjective well-being. *Journals of Gerontology: Psychological Sciences*, 56B, 364-373.
- Strack, F., & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review*, 8, 220-247.
- Taylor, S. E., Kemeny, M. E., Reed, G. M., Bower, J. E., & Gruenewald, T. L. (2000). Psychological resources, positive illusions, and health. *American Psychologist*, 55, 99-109.
- Tesch-Römer, C., Wurm, S., Hoff, A., & Engstler, H. (2002). Die zweite Welle des Alterssurveys: Erhebungsdesign und Instrumente [The second wave of the German Aging Study: Data collection procedure and instruments]. Berlin: Deutsches Zentrum für Altersfragen.
- Tett, R. P., & Meyer, J. P. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: Path analysis based on meta-analytic findings. *Personnel Psychology*, 46, 259-293.
- Teuscher, U. (2009). Subjective age bias: A motivational and information processing approach. *International Journal for Behavioral Development*, 33(1), 18-27.
- Trope, Y., & Liberman, N. (2000). Time-dependent changes in preferences. *Journal of Personality and Social Psychology*, 79, 876-889.
- Tziner, A., & Birati, A. (1996). Assessing employee turnover costs: A revised approach. *Human Resource Management Review*, 6(2), 113-121.
- Vorauer, J. D., Hunter, A. J., Main, K. J., & Roy, S. (2000). Meta-stereotype activation: Evidence from indirect measures for specific evaluative concerns experienced by members of dominant groups in intergroup interaction. *Journal of Personality and Social Psychology*, 78, 690-707.

- Vorauer, J. D., Main, K. J., & O'Connell, G. B. (1998). How do individuals expect to be viewed by members of lower status groups? Content and implications of meta-stereotypes. *Journal of Personality and Social Psychology*, 75, 917-937.
- Walton, G. M., & Cohen, G. L. (2003). Stereotype lift. *Journal of Experimental Social Psychology*, 39, 456-467.
- Ward, R. A. (1977). The impact of subjective age and stigma on older persons. *Journals of Gerontology*, 32, 227-232.
- Warr, P., Cook, J., & Wall, T. (1979). Scales for the measurement of some work attitudes and aspects of psychological well-being. *Journal of Occupational Psychology*, 52, 129-148.
- Watts, R.J., & Carter, R.T. (1991). Psychological aspects of racism in organizations. *Group & Organization Studies*, 16, 328-344.
- Weiss, E. M., & Maurer, T. J. (2004). Age discrimination in personnel decisions: A Reexamination. *Journal of Applied Social Psychology*, 34(8), 1559-1816.
- Wentura, D., & Brandtstädter, J. (2003). Age stereotypes in younger and older women: Analyses of accommodative shifts with a sentence priming task. *Experimental Psychology*, 50, 16-26.
- Wentura, D., & Rothermund, K. (2005). Altersstereotype und Altersbilder [Age stereotypes and images of old age]. In S. –H. Filipp & U. M. Staudinger (Eds.), *Entwicklungspsychologie des mittleren und höheren Erwachsenenalters [Developmental psychology of middle and later adulthood]* (pp. 616-654). Göttingen, Germany: Hogrefe.
- Wheeler, S.C., & Petty, R.E. (2001). The effects of stereotype activation on behavior: A review of possible mechanisms. *Psychological Bulletin*, 127(6), 797-826.
- Whitbourne, S. K., & Connolly, L. A. (1999). The developing self in midlife. In S. L. Willis & J. D. Reid (Eds.), *Life in the middle* (pp. 25–45). New York: Academic Press.
- Whitbourne, S. K., & Sneed, J. R. (2002). The paradox of well-being, identity processes, and stereotype threat: Ageism and its potential relationships to the self in later life. In T.

- D. Nelson (Ed.), *Ageism: Stereotyping and prejudice against older persons* (pp. 247 – 273). Boston: MIT Press.
- Williams, K. Y., & O'Reilly, C.A., III. (1998). Demography and diversity in organizations: A review of 40 years of research. *Research in Organizational Behavior*, 20, 77-140.
- Williams, L. M., Brown, K. J., Palmer, D., Liddell, B. J., Kemp, A. H., Olivieri, G., et al. (2006). The mellow years? Neural basis of improving emotional stability over age. *The Journal of Neuroscience*, 26(24), 6422-6430.
- Wolf, O. T., & Kudielka, B. M. (2008). Stress, health and aging: A focus on postmenopausal women. *Menopause International*, 14, 129-133.
- Wrenn, E. M., & Maurer, T. (2004). Age discrimination in personnel decisions: A re-examination. *Journal of Applied Social Psychology*, 34, 1555-1562.
- Wrenn, K. A., & Maurer, T. J. (2004). Beliefs about older workers' learning and development behaviour in relation to beliefs about malleability of skills, age-related decline, and control. *Journal of Applied Social Psychology*, 34(2), 223-242.
- Wrosch, C., Heckhausen, J., & Lachman, M. E. (2000). Primary and secondary control strategies for managing health and financial stress across adulthood. *Psychology and Aging*, 15(3), 387-399.
- Wurm, S., Tesch-Römer, C., & Tomasik, M. J. (2007). Longitudinal findings on aging-related cognitions, control beliefs, and health in later life. *Journals of Gerontology: Psychological Sciences*, 62B(3), 156-164.
- Zebrowitz, L. (2003). Aging stereotypes: Internalization or inoculation? A commentary. *Journals of Gerontology: Psychological Sciences*, 58B(4), 214-215.
- Zohar, D. (2000). A group-level model of safety climate: Testing the effect of group climate on microaccidents in manufacturing jobs. *Journal of Applied Psychology*, 85, 587-596.
- Zohar, D., & Luria, G. (2005). A multilevel model of safety climate: Cross-level relationships between organization and group-level climates. *Journal of Applied Psychology*, 90(4), 616-628.

Appendix A

Images of Aging Measures

Older Worker Meta-Stereotypes

Source: Noack et al., 2009. English translation in brackets.

In meiner Arbeitsgruppe gelten <u>ältere</u> (> 45 Jahre) Arbeitnehmer als...				
[In my work group older workers (> 45 years) are seen as...]	stimmt nicht	stimmt kaum	stimmt eher	stimmt genau
...kooperativ [cooperative]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...zuverlässig [reliable]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...loyal [loyal]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...lernbereit [prepared to learn]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...produktiv [productive]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...kreativ [creative]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...risikofreudig [willing to take risks]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...sicherheitsorientiert [safety/security oriented] ^a	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...competent [competent]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...flexible [flexible]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...zielstrebig [goal-oriented]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

Notes. ^aItem removed from final scale.

The scale for younger worker meta-stereotypes was the same with the single exception that the instructions read, "In meiner Arbeitsgruppe gelten jüngere (< 30 J.) Arbeitnehmer als ... [In my working group, younger employees (<30) are seen as...]."

Aging Self-Perceptions

Source: Wurm et al., 2007 and Tesch-Römer et al, 2002. English translation in brackets.

Wir werden alle älter. Was jedoch das Älterwerden für den Einzelnen bedeutet, kann sehr unterschiedlich sein. Bitte geben Sie an, inwieweit die folgenden Aussagen auf Sie persönlich zutreffen.

[We all age. However, what getting older means can be very different for different people. Please indicate the extent to which you agree with the following statements.]

Älterwerden bedeutet für mich, ... [Aging means to me...]	stimmt nicht	stimmt kaum	stimmt eher	stimmt genau
...weniger vital und fit zu sein. [...that I am less energetic and fit.]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...dass sich meine Fähigkeiten erweitern. [...that my capabilities are increasing.]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...dass mein Gesundheitszustand schlechter wird. [...that I am less healthy.]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...dass ich weniger respektiert werde. [...that I am less respected.]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...dass ich vielen Dingen gegenüber gelassener werde. [...that I am more relaxed about many things.]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...dass ich weiterhin viele Pläne mache. [...that I continue to make plans.]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...dass ich körperliche Einbußen schlechter ausgleichen kann. [...that I cannot make up for my physical losses.]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
...dass ich weiterhin in der Lage bin, neue Dinge zu lernen [...that I can still learn new things.]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

In addition, the following item was also included in the scale. This item was assessed separately due to format differences.

	stimmt nicht	stimmt kaum	stimmt eher	stimmt genau
Wie unternehmungslustig ich bin, hat nichts mit meinem Alter zu tun. [How engaged I am has nothing to do with my age.]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

Appendix B

Within-team Agreement Analysis: Work-Team Age Climate for Younger Workers

Indicator	Criteria	Work-Team Age Climate (Younger Workers) ($k = 36$)	
		Company A ($k = 14$)	Company B ($k = 22$)
ANOVA	Significant between-group differences, $F > 1$	$F(35, 268) = 1.32$, $p = 0.12$ $F(13, 134) = 1.54$, $p = 0.11$ $F(21, 134) = 1.17$, $p = 0.29$	
r_{wg}	> 0.70	0.86	0.93
AD_M	< 0.67 (4 answer categories)	0.45	
	< 0.50 (3 answer categories)	0.43	0.47
Eta-squared	~ 0.12	0.15	
		0.13	0.15
ICC(1)	Between 0.05 and 0.20	0.04	
		0.05	0.02
ICC(2)	0.60	0.24	
		0.35	0.15

Notes. k = number of teams.

Summary of results: The PACS for younger workers meets the r_{wg} , AD_M , and Eta-squared criteria for aggregation to the team level, but not the ANOVA, ICC(1) or ICC(2) criteria.

Overall, the PACS for younger workers failed to meet the criteria for aggregation to the team level.

