Examining Positive and Negative Perceptions of Older Workers: A Meta-Analysis

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Objective. This article presents an updated meta-analysis of field and laboratory studies that examine the influence of age on a number of evaluative workplace outcomes (advancement, selection, general evaluations, interpersonal skills, and reliability).

Method. A random effects meta-analytic procedure was used.

Results. In line with the perspective that perceptions of older workers are multidimensional, the observed meta-analytic correlations indicate that age has medium-sized negative effects on majority of the outcomes investigated ($r_{\text{advancement}} = -.21$, $r_{\text{selection}} = -.30$, $r_{\text{general evaluations}} = -.24$, and $r_{\text{interpersonal skills}} = -.23$), and a medium-sized positive effect on perceptions of reliability ($r_{\text{reliability}} = .31$). Additionally, evidence of moderation by study design for the selection outcome is presented, such that within-subjects designs elicit stronger effects of age than between-subjects designs.

Discussion. The present study demonstrates that it is likely that older workers are not viewed entirely negatively or entirely positively in the workplace; rather, the perceptions of older workers are more are varied, and even positive in some cases.

Key Words: Employment and older workers—Perception—Social cognition.

A increasing number of older individuals are delaying retirement and choosing to remain in the workforce past traditional retirement age (Winston & Barnes, 2007). Indeed, a recent survey suggests that 28% of U.S. workers indicate that the age at which they expect to retire has changed in the past year, with the vast majority of those individuals planning to postpone retirement (Employee Benefits Research Institute, 2009). Additionally, U.S. Census Bureau projections indicate that by the year 2042, one in five Americans will be more than 65 years of age. If only a small percentage of these older adults remain in the workforce, there will soon be a substantial increase in the number of older workers in the labor market (Bernstein & Edwards, 2008).

As workplace demographics shift to include an increasing number of older employees, understanding the way older workers are viewed in the workplace is increasingly important—particularly because an array of research indicates that younger and older employees are treated differently in the workplace (Posthuma & Campion, 2009). This issue is made more important by the illegality of differential treatment based upon age, as specified in the United States by the Age Discrimination in Employment Act (1967). With this in mind, we seek to meta-analytically synthesize the results of the body of research that investigates the impact of age on evaluative workplace outcomes, both to explain trends in this literature and to investigate the existence of potential moderators of this relationship.

BACKGROUND

Cognitive–Perceptual and Multidimensional Components of Ageism

Our investigation focuses specifically on the cognitive–perceptual component of ageism. Although several models exist to define ageism, and conceptual definitions can be traced back to more than 40 years (Butler, 1969), recent scholarship (Finkelstein & Farrell, 2007; Iversen, Larsen, & Solem, 2009; Nelson, 2002; Palmore, Branch, & Harris, 2005) adopts a tripartite model of ageism (in line with tripartite models of attitudes, see Fiske, 2004; Kite & Wagner, 2002). This model (Figure 1) suggests three distinct components of ageism that share a reciprocal relationship. Taken collectively, the tripartite view of ageism suggests that considering affective (positive or negative feelings), behavioral (dispositions or impulses to act in a certain way), and cognitive (perceptual) factors are important for understanding the nature and impact of ageism. With this in mind, we focus here on the cognitive–perceptual component of this model, specifically by investigating how age affects evaluative workplace outcomes to the extent that, all else being equal, older targets are perceived to systematically differ from younger targets. It is important to note here that this definition allows for the possibility for age to serve as both a detriment and benefit for older targets.

Although past meta-analyses have attempted to summarize this body of research, we extend this work here by incorporating more recent research (DeArmond et al., 2006;
Diekmann & Hirnisey, 2007; Erber & Long, 2006; Maurer, Barbeite, Weiss, & Lippstreu, 2008; Rupp, Vodanovich, & Crede, 2006) while maintaining a specific focus on those outcomes that are directly relevant to the workplace. Thus, we consider a larger number and variety of evaluative workplace outcomes than past meta-analyses, including advancement, selection, general evaluations, interpersonal skills, and reliability. Additionally, we have been able to capitalize on more recently published examinations of this phenomenon while maintaining conservative inclusion criteria.

Furthermore, we attempt to account for multidimensionality in perceptions of older workers, which is the theoretically grounded and empirically demonstrated notion that older workers are seen negatively in some respects and positively in others. The body of research investigating age in workplace contexts has produced mixed findings; although some studies have found that older workers are viewed more negatively than younger workers (e.g., Eis dorfer & Altrochi, 1961; Rosencranz & McNevin, 1969; Tipton Acker, 2008; Van Dalen, Henkens, & Schippers, 2010; Wernick & Manaster, 1984), others have yielded results that indicate no differences in attitudes toward these two groups (e.g., DeArmond et al., 2006; Diekmann & Hirnisey, 2007; Drevenstedt, 1981; Puckett, Petty, Cacioppo, & Fischer, 1983; Rothbaum, 1983).

The notion of multidimensional attitude structures is well documented in several literatures. For example, research on gender roles has suggested that women may be characterized in both positive (e.g., caring) and negative terms (e.g., weak; Bem, 1981). This notion that individuals can simultaneously hold both positive and negative impressions of an attitude object has been explained by cognitive categorization theories specific to perceptions of age (Hummert, 1999; Nelson, 2002). Such theories suggest that different schemas are automatically activated when one comes in contact with an older individual. These activated schemas serve as a basis by which individuals are perceived, and subsequently evaluated (Figure 2 for a summary of this general model).

Age is a salient and highly visible factor that is readily perceptible. Indeed, evidence suggests that the simultaneous association of positive and negative traits with older individuals has an automatic cognitive component (Perdue & Gurtman, 1990). Thus, when coming in contact with an older person, the awareness of age occurs automatically and serves to activate both positive and negative schemas regarding older individuals. These differentially valenced schemas influence the perceptual process, and thus have the potential to carry over and influence judgment outcomes in various ways. Similar models have been described as affecting a number of cognitive–perceptual judgmental processes (Bargh, 1994; Brewer, 1988; Fiske & Neuberg, 1990; Hamilton & Sherman, 1994).

One manifestation of this process is reflected in the workplace age stereotyping literature, which indicates that individuals hold a variety of stereotypes about older individuals in general, some positive and some negative. For example, research has suggested that older individuals tend to be seen as ambitious and more opinionated (Craft, Doctors, Shkop, & Benecki, 1979), but also wiser (Kogan & Shelton, 1960), more experienced (Finkelstein, Higgins, & Clancy, 2000) and more productive (Taylor & Walker, 1998). Generally, research has shown that physical and cognitive perceptions of older individuals are generally more negative than perceptions of interpersonal qualities (Crockett & Hummert, 1987). For a full review of such perceived strengths and weaknesses of older workers, see Shacklock, Brunetto, and Nelson (2009). By investigating a variety of workplace outcomes individually, we can identify and differentiate outcomes that are positively associated with the influence of age and those that are not.

**Previous Research Related to Perceptions of Older Workers**

Research concerning perceptions of older workers can be traced back to the early 1950s, and scholarship specific to the concept of ageism can be traced back to the late 1960s (Butler, 1969). For example, Tuckman and Lorge (1952) found that younger participants agreed more with the statements that described older workers in negative terms than older participants. Such early studies marked the beginning of a line of research examining reactions toward older workers. Over the years, this literature has grown to include a diverse...
variety of topics, including stereotypes (e.g., Diekman & Hirnisey, 2007; Ostroff & Atwater, 2003), ratee differences (e.g., Ostroff & Atwater, 2003; E. L. Perry, Kulik, & Bourhis, 1996), rater differences (e.g., Crew 1984; Finkelstein & Burke, 1998; Rosen & Jerdee, 1976a, 1976b), and amount of information given about the target of the rating (e.g., Finkelstein & Burke, 1998; E. L. Perry et al., 1996).

Given the relatively long history of this research, it is not surprising that several previous meta-analytic investigations regarding ageism in both work and nonwork settings exist (Table 1). For example, in nonwork settings, Kite and Johnson (1988) found a small to moderate (0.39) mean weighted effect size, and surmised that attitudes toward older individuals are generally more negative than attitudes toward younger individuals. Across the studies included in Kite and Johnson, older targets were more negatively evaluated than younger targets, particularly in ratings of competence—a factor important to work performance. This research found small differences for desirable contact and personality traits, such that older targets were evaluated in a more negative manner than were younger targets. Furthermore, support for moderation for a variety of variables (study design, rating type, and the experimental setting) was garnered.

Focusing on workplace outcomes, Finkelstein, Burke, and Raju (1995) sought to identify situational factors (rater characteristics, ratee descriptions, and experimental conditions) that contribute to age discrimination in laboratory contexts. The results presented by this study are consistent with Kite and Johnson (1988), namely that older workers are rated lower on job qualification and potential for development than younger workers. Additionally, this research found that younger raters gave less favorable ratings to older workers than did older raters when there was little information given about the target.

A more recent meta-analysis by Gordon and Arvey (2004) again sought to examine the nature of perceptions of older workers by investigating workplace outcomes (overall evaluations, interpersonal skills, potential for development, and stability) and moderators of this effect (type of stimulus person, type of dependent variable, and type of research design). Older workers were seen as less likely to adapt to new tasks and situations, and resist change, but also as more stable and reliable; this research did not find significant differences for ratings of interpersonal skills. With respect to the moderators of interest, this study found that older workers were given more negative evaluations in within-subjects designs than between-subjects designs. Finally, in what is largely an update of the original Kite and Johnson (1988) study, Kite, Stockdale, Whittley, and Johnson (2005) found that older adults were viewed more negatively than younger adults on a variety of outcomes, and the effect of ageism was strongest for stereotypic beliefs and ratings of attractiveness and weakest for behavioral intentions and affective evaluations.

With this investigation, we aim to build upon and extend the theoretical groundwork laid by these previous meta-analyses. Specifically, we have narrowed the focus here to workplace outcomes in the vein of Finkelstein and colleagues (1995), but also expanded focus to include studies with workplace outcomes that were conducted in both laboratory and field settings. Following from Gordon and Arvey (2004), we have identified a number of workplace outcomes important to this investigation; however, the list is further expanded to include an additional outcome (selection) not included in past meta-analyses. Furthermore, each outcome has been investigated separately to demonstrate that the effect of age can be associated with both negative and positive outcomes. We distinguish between selection and more general overall evaluations and advancement decisions because of the particular importance of selection as an evaluative workplace outcome (Gatewood, Field, & Barrick, 2008). One advantage of this approach is that evaluative workplace outcomes can be treated separately, allowing a single study to contribute more than one effect size, while allowing these effect sizes to remain independent because they are associated with different outcomes. In comparison with this study, Finkelstein and colleagues extracted 15 independent effect sizes, whereas Gordon and Arvey had 52. The 87 independent effect sizes we extracted are reflective of both the advantage of including laboratory and field studies and considering the additional selection outcome.

Additionally, we seek to capitalize on an additional 12 years of research conducted in this field, which were not included in the most recent meta-analysis of this literature (Gordon & Arvey, 2004) by including studies published since 1998 that investigate perceptions of older workers (Table 1). Furthermore, in line with recent scholarship suggesting that random-effects meta-analytic procedures are a best practice (Kisamore & Brannick, 2008), we ran our analyses following the assumptions of a random-effects model. Thus, we suggest that this study provides a novel contribution to the literature in that the studies included, outcomes considered, and methods employed are all important extensions from previous work. What follows is a summary of the literature related to the specific outcomes and moderators of interest, as well as the identification of hypotheses tested here.

Outcomes of Interest

Before discussing the procedures used to arrive at the meta-analytic results, it makes sense to consider the outcomes of interest, particularly with respect to how they are discussed in the literature concerning perceptions of older workers. This discussion serves to inform the hypotheses tested here.

Advancement.—Advancement outcomes encompass ratings of potential for development, promotion outcomes, and
predicted success of the target. All these variables are performance judgments that represent potential for advancement, as opposed to general performance appraisals, which are typically done to once or twice a year to identify job-relevant strengths and weaknesses (Cascio & Aguinis, 2005). These variables refer to the general potential for or likelihood of advancement. Previous research has found that older adults are less likely to be selected for these opportunities than younger adults (e.g., Cleveland & Shore, 1992; Singer & Sewell, 1989; Weiss & Maurer, 2004), thus:

Hypothesis 1: Age has a main effect on advancement outcomes, such that older employees are perceived significantly lower on advancement outcomes than younger employees.

**Selection.**—Selection outcomes encompass ratings of job qualification, hiring outcomes, and suitability for the job, and refer to the fit of the target to a particular job (Gatewood et al., 2008). Previous research has shown that older workers tend to be given lower ratings of fit to the job than younger workers (e.g., Connor, Walsh, Litzenimer, & Alvarez, 1978; Diekmann & Hirnisey, 2007; E. L. Perry, 1994), therefore:

Hypothesis 2: Age has a main effect on selection outcomes, such that older employees are perceived significantly lower than younger employees in hiring decisions.

**General evaluations.**—General evaluations encompass overall evaluations, which include a theme of general performance or overall performance and performance outcomes. These two variables are general evaluations of an individual’s performance, which can be conceptualized as the total expected value that an individual contributes to an organization through discrete behavioral episodes over a defined period of time (Motowidlo, 2003). Previous research supports the notion of combining overall evaluations with overall performance, suggesting a general factor in performance ratings—-independent of halo—that can explain up to 49% of the total variance in performance ratings (Viswesveran, Schmidt, & Ones, 1996). Previous research has shown that older workers tend to receive lower general evaluative ratings than younger workers (e.g., Cleveland & Landy, 1981; Drehmer, Carlucci, Bordieri, & Pincus, 1992; MacDermott, 2004), thus:

Hypothesis 3: Age has a main effect on general evaluative outcomes, such that older employees are perceived significantly lower than younger employees on general evaluative ratings.

**Interpersonal skills.**—Interpersonal skills encompass one’s evaluation of how skilled individuals are at relating interpersonally. Research has found that on average, older adults tend to be rated lower than younger adults on interpersonal skills (e.g., Cleveland & Landy, 1981; DeArmond et al., 2006; Singer & Sewell, 1989), therefore:

Hypothesis 4: Age has a main effect on perceptions of interpersonal skills, such that older employees are perceived significantly lower than younger employees on interpersonal skill.
Reliability.—Reliability outcomes encompass individuals’ perceptions of how reliable or stable an employee is in the workplace. Reliability has a positive correlation with age, such that older adults are rated higher on average than younger adults (e.g., Diekman & Hirnisey, 2007; Rupp et al., 2006; Shore & Bleckeen, 1991). Furthermore, reliability has been an outcome of interest in previous meta-analyses of age bias (Finkelstein et al., 1995; Gordon & Arvey, 2004), therefore:

Hypothesis 5: Age has a main effect on perceptions of reliability, such that younger employees are perceived significantly lower than older employees on reliability.

Moderators of Interest

In addition to considering each type of evaluative outcome separately, a potential moderator of interest in our investigation was study design. (Initially, a larger number of moderators were coded for, including publication year and status, research setting and design, mean respondent age, participant age range, sample gender composition, participant type [undergraduate, graduate, professional], type of target [applicant or incumbent], target presentation [general—e.g., “older person,” medium—e.g., “older person with age range,” specific—e.g., “65 years old”], amount of job-relevant individuating information provided, method of age manipulation [e.g., fictitious resume with picture or no picture, performance vignette with picture or no picture, video], age of younger target/older target, race/sex of target, job type, job age [younger, age neutral, older]. For brevity’s sake, nonsignificant moderators are not reported. Race of target, sex of target, amount of job-relevant, individuating information, method of age manipulation, and nationality of sample were coded for as well but were not tested due to the small number of studies that included this information. Nonsignificant moderators included research setting, type of stimulus person, mean age of rater, and age range between young and old targets.) Study design refers to whether the study was performed using a between-subjects design or a within-subjects design. This variable was examined as a possible moderator because of the influence it has on the process by which people make comparisons. In a within-subjects design, participants are exposed to both or all of the conditions, which means that participants are exposed to both a younger and an older stimulus person. This direct comparison might influence the ratings of the targets by creating a situation in which, all other characteristics being equal, age becomes especially salient. Previous meta-analyses (Finkelstein et al., 1995; Gordon & Arvey, 2004) have demonstrated results to support this. Therefore, we hypothesize the relationship subsequently:

Hypothesis 6: Study design moderates the relationship between age and all five of the evaluative workplace outcomes, such that the effect size is stronger for the relationship between age and the outcome for studies that utilized a within-subjects design than for studies that utilized a between-subjects design.

Methods

Sample of Studies

Computer-based literature searches were conducted using the following databases: Psych Info (1960 to December 2010), ABI (1992 to December 2010), EconLit (1960 to December 2010), GoogleScholar, ScienceDirect, and Ageline. These searches used the following key terms: older workers, age bias (and variations such as ageism in the workplace, age discrimination, generation bias, and generation stereotypes), younger workers, and workplace outcomes (including selection, potential for development, promotion outcomes, predicted success, advancement, job qualification, hiring outcomes, suitability for the job, general evaluations, reliability, overall evaluations, interpersonal skills, and performance outcomes). Additionally, manual searches were conducted through reference lists of review articles, previous meta-analyses on similar topics, as well as books and book chapters.

Inclusion Criteria for Studies

In order to be included, studies had to have (a) a comparison between an identifiable “older” and “younger” group of target individuals, and (b) at least one outcome of comparison that was identifiable a workplace outcome. Studies that included more than two groups of age comparison (e.g., a “middle aged” group) were included; however, only the comparisons between older and younger groups were included in our meta-analysis. In instances where a study contained multiple older or younger groups (e.g., groups of both 60-year-old and 70-year-old employees), the comparison between the two groups that best fit what the total body of research conceptualized as “older” and “younger” was chosen. Since the average age across the studies included was 56 for the older group and 33 for the younger group, we sought to select the comparisons that best fit these ages. Thus, in the case of a study that included a younger group and two older groups, one with 60-year-olds and another with 70-year-olds, the comparison between the younger group and the 60-year-old group would be chosen because 60 is more reflective of the average age of 56.

Additionally, the inclusion criteria limited us to only include studies containing comparisons in which there was an evaluative workplace outcome, so as to ensure that all effect sizes included in the meta-analysis reflected only those evaluations of older and younger employees in which the outcomes could be directly tied to the workplace. This distinction is important as a large body of research exists examining specific perceptions of older workers compared with younger workers.
with older individuals in general (e.g., Kite & Johnson, 1988; Kite et al., 2005).

The final criterion for inclusion was that all studies must have reported the necessary statistics to calculate an effect size estimate (e.g., means, standard deviations, and sample sizes for both older and younger targets). If a source met all the inclusion criteria necessary but lacked an important piece of statistical information, we attempted to contact the primary authors of the work for information that would allow the study to be used; however, the response as a result of these efforts was low. For researchers who did respond, it was the case that a certain amount of time had passed and the information necessary to conduct the required analyses was no longer retained.

Additionally, in an attempt to mitigate the effects of the commonly cited “file drawer” problem (McDaniel, Rothstein, & Whetzel, 2006), attempts were made to identify unpublished sources for inclusion. Specifically, we contacted other known researchers in this field to identify any unpublished manuscripts for inclusion here. Furthermore, thesis and dissertation abstract searches were conducted.

An initial search employing these methods listed previously yielded a potential pool of 68 studies, 7 of which were unpublished. However, further examination led to a total of 34 published sources and three unpublished sources remaining for analysis that met all of the criteria for inclusion.

In comparison with the most recent similar meta-analysis conducted on this topic, we included a majority of the studies included by Gordon and Arvey (2004) and were able to identify nine additional studies for inclusion. It is worthwhile to note here that the absolute number of studies included herein is lower than that of Gordon and Arvey. This is due to (a) different inclusion criteria and (b) investigating a different range of outcomes. Furthermore, it is worthwhile to note here that the present meta-analysis includes studies since 1998, the year of the last published study included in Gordon and Arvey.

Of the total number of sources used for analysis, we were able to extract 87 independent effect sizes. This number is substantially larger than the number of published sources in part due to the multiple outcomes of interest. Some of the sources contained more than one study or reported more than one outcome from which multiple effect sizes could be derived. Cooper’s (1998) shifting unit of analysis strategy was used, whereby each relevant outcome was coded as an independent event, allowing a study with a single sample of participants to be coded as multiple separate effect sizes. Furthermore, independence was assured because the effect sizes extracted were not collapsed across outcomes.

Variables coded from each study.—As suggested previously, the final list included the following five outcomes: (a) advancement (which included ratings of potential for development, promotion outcomes, and predicted success); (b) selection (which included ratings of job qualification, hiring outcomes, and suitability for the job); (c) general evaluations (such as overall evaluations or performance evaluations); (d) interpersonal skills; and (e) reliability. (A number of evaluative workplace outcomes were coded for, including: job qualification, potential for development, reliability, overall evaluation, interpersonal skills, hiring outcome, performance outcome, promotion outcome, predicted success, and suitability for the job. These outcomes were included because of inclusion in past studies of age discrimination in employment settings [e.g., Finkelstein et al., 1995], previous meta-analyses of age bias [e.g., Gordon & Arvey, 2004], or previous meta-analyses on bias that included evaluative workplace outcomes [e.g., Rudolph, Wells, Weller, & Baltes, 2008; Hosoda, Stone-Romero, & Coats, 2006]. However, due to a small number of effect sizes for some outcomes, several categories of outcomes were collapsed or recoded to reflect a broader common theme. Two independent subject matter experts coded the outcomes into the final five categories. There were very few instances of disagreement (intraclass correlations for agreement ranged from \( r_{icc} = .91 \) to \( .95 \), and those that did occur were discussed until consensus was reached.) In studies where only one effect size fell under the broader common category, the effect size was simply coded in light of these categories. However, in studies where there was more than one effect size (e.g., an effect size for both job qualification and suitability for the job, both of which fit under advancement), the effect sizes were averaged to create one single effect size (similar to methods in previous meta-analyses, e.g., Parker et al., 2003). This decision was made after an examination of the data revealed that a portion of the effect sizes under the broader categories would suffer from dependency issues otherwise. Furthermore, the direction and magnitude of effect sizes were similar in many of the instances in which collapsing was necessary.

Although the researchers coded for many other variables initially (race of target, sex of target, amount of job-relevant individuating information, method of age manipulation, nationality of sample, etc.), the small number of studies that provided this information excluded many moderator categories from inclusion in analyses. In addition to categorical information, continuous information such as mean participant age and age difference between young and old target was included in the coding. The vast majority of studies included information about the mean participant age. Ten studies were missing the information necessary to compute an age difference between the young and old target; thus, approximately two-third of the studies also included this information. Two subject matter experts (A. C. Bal and A. E. B. Reiss, the first and second authors) coded each study, and Intraclass correlation coefficients (Shrout & Fleiss, 1979) were calculated for the moderator tested here \( (r_{icc} = .96 \) for study design). The third (C. W. Rudolph) and fourth (B. B. Baltes) authors helped to discuss and resolve any disagreements.
Meta-analytic Procedures

Computation of effect sizes and outlier analysis.—First, the researchers converted all the effect sizes from the primary studies into a common statistic, $r$, reflecting the effect of age on the various evaluative workplace outcomes. This was done using an Excel macro program entitled “Effect Size Determination Program” (Wilson, 2001), which utilizes formulae from Lipsey and Wilson (2000). A list of the effect sizes, both $r$ and $d$, are calculated for each of the outcomes in each of the studies and included in Table 2. The computation of $r$ was based on (a) 55% means and standard deviations, (b) 22% $F$ or $t$ tests, (c) 20% existing $r$ values, and (d) 3% chi-square values or proportions. To determine the relative stability of the effect size estimates, the researchers ran outlier analyses for each of the five outcomes. Effect sizes were transformed to $z$ scores. An effect size with a $z$ score more extreme than the ± 3.29 value associated with an alpha value of .05 (two-tailed) would have been considered an outlier; however, the results revealed no apparent outliers for any of the effect sizes in any of the categories of outcomes. An effect size was coded as positive if it favored the older target group and negative if it favored the younger target group.

Statistical methods.—The meta-analytic strategy employed here was based on that of Hedges and Olkin (1985), with modified analytic procedures to allow for the assumptions of a random-effects model. Although other meta-analytic strategies exist (e.g., Hunter & Schmidt, 1990), we chose this analysis strategy because among the studies included in the current analysis, there were few potential issues associated with predictor (age) unreliability. However, issues associated with criterion unreliability (in the measurement of evaluative workplace outcomes) could present an issue, though few studies included in our meta-analysis reported reliability information for the evaluative workplace outcomes measured, and many studies relied on single-item measures to assess such outcomes. Thus, applying corrections for criterion unreliability was not feasible. Furthermore, there was no evidence that range restriction was attenuating any of the relationships that were coded for in this meta-analysis. Thus, applying corrections for statistical artifacts was not possible for a majority of cases, and indeed not theoretically relevant for the current meta-analysis. It should also be reiterated here that the overall progression of analyses was based on the assumptions of a random-effects meta-analytic model. A random-effects approach rather than a fixed-effects approach was used because of the assumption that the true effect size varied among the included studies and should be weighted accordingly.

Because we considered a number of outcomes, the first step was to run analyses that looked for main effects in each category of outcome. Thus, we ran five of these subanalyses. A $Q$-statistic was obtained for each subanalysis, and where there was significant heterogeneity of variance to warrant analyses for moderators, we investigated potential categorical moderator relationships for outcomes where particular moderators could be theoretically justified.

The homogeneity of within-class effect sizes, as well as the significance of between-class effects was assessed using a general $Q$-statistic and confidence intervals derived from the random-effects approach. In order to interpret the results, effect sizes were converted into $d$ statistics, and interpreted based on the suggestions of Cohen (1988), such that effect sizes of .20 or less are considered small, those around .50 are considered medium, and .80 or higher are considered large effect sizes. These values ($d$) correspond to weighted uncorrected $r$ values of .10, .25, and .40, respectively.

RESULTS

Main Effect Analyses

As suggested, the focus here was not on obtaining an overall effect size across the outcomes identified. One important reason for our decision to consider the outcomes of interest separately is evidence for the multidimensionality of perceptions of older workers, which suggests that older workers are perceived both positively and negatively in the workplace, and as a result experience both positive and negative outcomes at work. Thus, it seems inappropriate to interpret an overall effect here, given the inability of an overall effect to capture this complex relationship. (As some readers might be curious about the overall effect, we present it here. Consistent with findings in previous meta-analyses, we find an overall effect size ($r = −.17, d = −.34$) that was negative and small.) All the results with respect to the subanalyses for each outcome are presented in Table 3. All the hypotheses regarding the main effect of age on the five evaluative workplace outcomes garnered support, indicated by effect sizes whose 95% confidence interval did not include zero. These results are summarized subsequently, and in Table 3.

The meta-analytically derived effect size estimates for advancement ($r = −.21, d = −.43$), selection ($r = −.30, d = −.63$), general evaluations ($r = −.24, d = −.49$), and interpersonal skills ($r = −.23, d = −.47$) were medium-sized and negative, consistent with the hypotheses that these outcomes would be more negative for older workers. Additionally, the effect size for perceptions of reliability ($r = .31, d = .65$) was medium sized, and in a positive direction, consistent with the hypothesis that this outcome would be more positive for older workers. Ultimately, the effect sizes obtained for the outcomes investigated indicate medium-sized negative effects of age on selection, advancement, and general evaluations and perceptions of interpersonal skills. However, not all the outcomes were negative, as demonstrated by the medium-sized positive effect of age on perceptions of reliability. Furthermore, information from the $Q$ statistic, which is a test of heterogeneity, indicates that two
of the outcomes are significantly heterogeneous. Thus, although the hypotheses generally included all possible outcomes for which a moderator would make theoretical sense, such analyses proceeded for only the selection and general evaluation outcomes.

**Moderator Analysis**

Although we hypothesized that study design would moderate the relationship between age and both selection and general evaluations, the analyses revealed evidence of moderation for the relationship between age and the selection outcome only. When study design is considered, the 95% confidence interval for studies that used a between-subjects design (−0.28 to 0.01) exhibits no overlap between the confidence interval for studies that used a within-subjects design (−0.54 to −0.30). In fact, it would appear that between-subjects studies do not result in a significant effect, as the 95% confidence interval includes zero (r = −.13, d = −0.26). However, the within-subjects studies result in a large effect (r = −.40, d = −0.87). These results are in line with the notion that when individuals are asked to make a comparison between an older and a younger employee, the salience of age is enhanced, and this salience leads to an enhanced effect on the relationship between age and the outcomes of interest.

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**Table 2. Summary of Effect Sizes Included in the Meta-Analysis**

<table>
<thead>
<tr>
<th>Study</th>
<th>Advancement</th>
<th>Selection</th>
<th>General evaluations</th>
<th>Interpersonal skills</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleveland and Landy (1981)</td>
<td>−.20 (−0.40)</td>
<td>−.04 (−0.08)</td>
<td>−.11 (−0.22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleveland and Shore (1992)</td>
<td>−.35 (−0.75)</td>
<td>−.18 (−0.37)</td>
<td>−.17 (−0.35)</td>
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<td></td>
</tr>
<tr>
<td>Connor and colleagues (1978)</td>
<td>−.36 (−0.77)</td>
<td>−.08 (−0.16)</td>
<td>−.12 (−0.24)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cox (2010)</td>
<td>−.08 (−0.17)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Craft and colleagues (1979)</td>
<td>−.25 (−0.52)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crew (1984)</td>
<td>−.83 (−2.99)</td>
<td>−.78 (−2.53)</td>
<td>−.22 (−0.45)</td>
<td></td>
<td>.52 (1.22)</td>
</tr>
<tr>
<td>DeArmond and colleagues (2006)</td>
<td>−.98 (−11.06)</td>
<td>−.99 (−13.95)</td>
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<td>Diekmann and Hirnisey (2007)</td>
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<td>−.24 (−0.49)</td>
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<td>Ferris, Yates, Gilmore, and Rowland (1985)</td>
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<td>Finkelfstein and Burke (1998)</td>
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<td>MacDermott (2004)</td>
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<tr>
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<tr>
<td>E. L. Perry and Bourhis (1998)</td>
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<td>−.91 (−4.36)</td>
<td>−.33 (−0.71)</td>
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<tr>
<td>Rosen and Jerdee (1976a)</td>
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<td>−.91 (−4.36)</td>
<td>.00 (0.00)</td>
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<td>Rosen and Jerdee (1976b)</td>
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<td>Sharit, Czaja, Hernández, and Nair (2009)</td>
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<td>.10 (0.20)</td>
</tr>
<tr>
<td>Shore, Cleveland, and Goldberg (2003)</td>
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<td>−.03 (−0.06)</td>
<td>−.41 (−0.91)</td>
<td>.33 (0.70)</td>
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<tr>
<td>Singer (1986)</td>
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<td>Singer and Sewell (1989)</td>
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<td>.09 (0.19)</td>
<td>−.01 (−0.02)</td>
<td>.04 (0.07)</td>
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<tr>
<td>Tipton Acker (2008)</td>
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<td>.03 (0.05)</td>
<td>−.07 (−.14)</td>
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<tr>
<td>Van Dalen and colleagues (2010)</td>
<td>−.03 (−0.06)</td>
<td></td>
<td>−.03 (−0.06)</td>
<td>−.01 (−0.02)</td>
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</tr>
<tr>
<td>Weiss and Maurer (2004)</td>
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<td>−.02 (−0.03)</td>
<td>.23 (0.46)</td>
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Table 3. Effects of Age on Evaluative Workplace Outcomes With Between- and Within-Homogeneity Tests Across Study Characteristics

<table>
<thead>
<tr>
<th>Outcome and moderators</th>
<th>$k$</th>
<th>$N$</th>
<th>Mean weighted ($r$)</th>
<th>95% CI for $r$</th>
<th>Weighted effect size ($d$)</th>
<th>$Q$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advancement</td>
<td>18</td>
<td>3,239</td>
<td>−0.21</td>
<td>−0.29 to −0.13</td>
<td>−0.43</td>
<td>7.66</td>
</tr>
<tr>
<td>Selection</td>
<td>18</td>
<td>3,661</td>
<td>−0.30</td>
<td>−0.42 to −0.18</td>
<td>−0.63</td>
<td>58.07**</td>
</tr>
<tr>
<td>(M) Study design*</td>
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<tr>
<td>Between subjects</td>
<td>8</td>
<td>1,297</td>
<td>−0.13</td>
<td>−0.28 to 0.01</td>
<td>−0.26</td>
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<tr>
<td>Within subjects</td>
<td>9</td>
<td>2,011</td>
<td>−0.40</td>
<td>−0.54 to −0.30</td>
<td>−0.87</td>
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<tr>
<td>General evaluations</td>
<td>17</td>
<td>2,564</td>
<td>−0.24</td>
<td>−0.36 to −0.12</td>
<td>−0.49</td>
<td>36.79**</td>
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<td>(M) Study design</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Between subjects</td>
<td>7</td>
<td>928</td>
<td>−0.21</td>
<td>−0.32 to −0.10</td>
<td>−0.43</td>
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</tr>
<tr>
<td>Within subjects</td>
<td>10</td>
<td>1,352</td>
<td>−0.28</td>
<td>−0.48 to −0.08</td>
<td>−0.58</td>
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<tr>
<td>Interpersonal skills</td>
<td>15</td>
<td>1,541</td>
<td>−0.23</td>
<td>−0.34 to −0.13</td>
<td>−0.47</td>
<td>23.16</td>
</tr>
<tr>
<td>Reliability</td>
<td>13</td>
<td>2,584</td>
<td>0.31</td>
<td>0.17 to 0.44</td>
<td>0.65</td>
<td>16.91</td>
</tr>
</tbody>
</table>

Notes: Significant effect sizes are indicated by confidence intervals that do not include 0. Negative effect sizes indicate a more negative outcome for older workers, whereas positive effect sizes indicate the opposite. CI = confidence interval; $k =$ number of effect size; (M) = moderator.

*Confidence intervals do not overlap, thereby indicating significant moderation.

**$p < .01$.

**DISCUSSION**

This investigation serves to update existing meta-analytic examinations of the effects of age in the workplace by taking the unique approach of considering evaluative workplace outcomes separately rather than aggregating outcomes for an overall effect. By taking this approach, we demonstrate the likelihood that older workers are not viewed entirely negatively or entirely positively in the workplace. Rather, the effects of age are more aptly described as varied.

The first set of hypotheses (Hypotheses 1–4) were supported, in that main effects of age on all five of the identified outcomes were observed. Such effects suggest such a significant negative impact of age on the outcomes of advancement, selection, general evaluations, and interpersonal skills. In addition, Hypothesis 5, which specified a significant positive effect for ratings of reliability was supported. Indeed, the overall mean weighted effect sizes found here for each outcome support their respective hypotheses. The strongest negative effect for older workers was observed for the selection outcome, and the size of the effect is moderate. Overall mean weighted effect sizes for advancement, general evaluative, and interpersonal skills outcomes were also moderate, similar to the findings of past meta-analyses that included similar outcomes (Finkelstein et al., 1995; Gordon & Arvey, 2004). The only positive effect for older workers was observed in the reliability outcome, which exhibited a moderate effect size. This finding is also similar to the finding of the Finkelstein and colleagues (1995) meta-analysis, which included a reliability outcome. It is interesting to note here that the strongest absolute effect observed was for the reliability outcome, suggesting that certain positive perceptions of older workers may indeed be as strong as negative perceptions.

Of the five evaluative workplace outcomes, general evaluations and selection demonstrated sufficient heterogeneity to warrant the investigation for potential moderators. With regard to the selection outcome, study design (within- or between-subjects design) was a significant moderator; the effect of age on selection is significantly stronger (and more negative) for older workers in the case of studies that utilized a within-subjects design.

One finding of particular interest was the effect of age on selection outcomes. This outcome has not been considered in previous meta-analyses, and yet it exhibited an effect with a level of magnitude that is similar to other previously studied outcomes. Additionally, the results obtained here contribute to our understanding of this body of research by suggesting that when evaluative workplace outcomes are considered separately, a unique and more complex picture of the relationship between age and workplace outcomes emerges than if simply an overall effect of age is considered. Specifically, we suggest that the effect is not universally negative. Rather, older workers tend to be evaluated more favorably than younger workers in terms of their reliability.

**Limitations and Areas for Future Research**

No study is without limitations. We could not completely examine some potential moderators of interest because of the small number of effect sizes that included the necessary information. For example, although we coded “sex of the target” as a potential moderator, an insufficient number of studies that included female targets made it impossible to ascertain if sex of the target plays a role in the relationships we investigated. Although previous investigators have also encountered the issue of small $k$s, the problem is perhaps exacerbated by our goal of considering each workplace outcome separately. However, we had a strong theoretical reason for not collapsing across outcomes for an overall effect. Therefore, it is likely that information about potentially interesting moderators cannot be attained until more single study examinations are conducted.

Additionally, the majority of data included in our meta-analysis, as well as this field of research in general, were cross-sectional. Future efforts should be made to employ use of longitudinal designs to track the same employees over time. This may be a useful tool to address any potential confounds due to cohort effects. Consideration of even more
outcomes may reveal additional information about the complex effects of perceptions of older workers in the workplace. For example, more intangible outcomes such as the effect of age on colleagues’ willingness to work together with older individuals on projects and teams, and the mentoring relationship between mentors and older protégés should be examined, as some of these intangible outcomes may contribute the climate for aging in the workplace, and as such contribute to the overall workplace experience of older workers.

Future researchers should also focus on practices to create workplaces that are more conducive to eliminating the potential for perceptual difference between older and younger workers to influence interactions and judgment-based outcomes. To this end, managerial practices and employee evaluations that reduce the negative effects presented here should be investigated. Although interventions exist which can mitigate the effects of other types of bias in evaluative workplace outcomes (e.g., Structured Free Recall, Baltes, Bauer, & Frensch, 2007; Bauer & Baltes, 2002), research has yet to determine whether these interventions can be applied successfully to situations in which older workers are being evaluated, and what—if any—modifications are necessary to make such interventions work in these settings. It may also be interesting to investigate how perceptions of older workers interact with other forms of bias, as evidence suggests that when employees are made more sensitive to policies about hiring women and minorities, older employees may also receive better treatment (Rosen, Jerde, & Huonker, 1982).

Looking toward a future workplace that promises to include an increasing proportion of older workers, a number of important implications for the workplace and intriguing directions for aging researchers emerge. In the present, we can only speculate about how the changing global workplace will affect outcomes like advancement and selection for employees in general, and for older employees specifically. However, as global populations age, and skill gaps emerge in key areas, older workers are likely to be an integral part of the future workforce (Avery, 2007). Indeed, it is possible that trends such as reducing hierarchies to flatten organizations (Daft, 2003), increasing global expansion (Ghosh, 2010), and relying on contract work may serve to exacerbate the effects of perceived age differences on workplace outcomes.

With the flattening of organizations and fewer opportunities for advancement, organizations will need to consider a variety of factors when making employment decisions. For instance, there may be a need for organizational development models that invest in employee expertise rather than mobility, and to emphasize the creation of value propositions that rely on incentives other than hierarchical advancement. Furthermore, it is likely that organizations will become increasingly reliant on contract work, which is particularly relevant to the results of our study when one considers that limited interpersonal contact can decrease the ability for people to individuate among targets when making decisions (Allport, 1954; Pettigrew & Tropp, 2006).

Managers will need to acknowledge the prevalence of variation in the perceptions of older workers, and take steps to ensure its impact does not affect employment decisions and expose employers to legal liability. Furthermore, training future managers to work with older employees should emphasize the greater variation within age groups than between age groups and recognize that variables such as employee skill are more important than age in predicting job performance (Posthuma & Campion, 2009). Human resource practices that are based upon valid, thoughtfully applied methods, along with further research investigating the complex relationships associated with perceptions of older workers, will remain necessary as the workforce ages.

*Indicates references that were included in the meta-analysis.

Acknowledgments

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References


