

Older Workers and Poor Performance: Examining the Association of Age Stereotypes with
Expected Work Performance Quality

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Abstract

We investigated how age-based worker stereotypes correspond with attributes of expected work performance. Participants ($N = 220$) rated 86 stereotypical descriptors of older (e.g., “resistant to change”) and younger workers (e.g., “savvy with technology”). Each descriptor was rated on both the extent that it was a common stereotype about younger (versus older) workers, and characteristic of good (versus poor) expected work performance. Ratings revealed stereotypes that were strongly associated with both a worker age group and with work performance quality, offering an explanatory mechanism for how candidates’ ages might influence judgments around personnel selection. A table of the paired age/performance ratings is provided to encourage the development of less age-biased recruitment and selection materials.

Keywords: age stereotypes; older workers, younger workers, work performance, recruitment, selection, age bias

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Older worker stereotypes, which are overgeneralized beliefs and expectations about a worker's qualities and traits based on their age (Toomey & Rudolph, 2015), have persisted for decades. Research has shown that subscribing to persistent negative stereotypes about older workers can result in the withholding of work-associated resources such as employment or promotion opportunities (Truxillo et al., 2017), which then affects the employment outlook and quality of life for this growing segment of the population (Bal et al., 2011). However, more work is needed to uncover mechanisms that explain why age stereotypes lead to age-based discrimination at work (Truxillo et al., 2017). This study provides preliminary evidence that many older worker stereotypes are associated with work performance expectations, revealing a potential explanation for why negative age biased beliefs sometimes harm older workers' employment opportunities. Specifically, our analyses explored the extent to which age-related worker stereotypes were descriptive of older workers and poor (or good) work performance. Insights from this study can be used to combat workplace age discrimination, as well as explore ways to harness positive age-based stereotypes as an organizational tool.

In this study, we posit that many age-based worker stereotypes are associated with work performance expectancies, namely, the anticipated value that an individual worker adds to an organization (Beier & Kanfer, 2013). In other words, stereotypes are used to make dispositional attributions about others, which can then contribute to beliefs about the expected work performance, and hence value, of those others (Cuddy & Fiske, 2004). Support of our theoretical argument can be found in the depreciation model (Yeatts et al., 2000), a prevalent organizational philosophy which asserts that the value of older workers diminishes over time due to expected declines in performance and increases in employment related expenses (e.g., higher salaries and insurance premiums; Rau & Adams, 2013). Furthermore, prior research

has linked stronger negative bias against older workers to lower performance evaluations (Perry et al., 1996). The underlying (and thus far untested) assumption is that negative older workers stereotypes are linked to negative performance attributes. Importantly, however, *positive* stereotypes about older workers also exist (Posthuma & Campion, 2009; Toomey & Rudolph, 2015), and in fact, individuals often hold a mix of both positive and negatives beliefs about older workers (Bal et al., 2011). However, positive older worker stereotypes are relatively understudied, and relationships between positive beliefs and performance expectations and ratings are unknown.

Further, we note that work-related age bias is not unique to older workers, and yet very little research has explored younger worker stereotypes. Younger workers' employment prospects might also be affected by negative age-biased beliefs, such as them being lazy or uncommitted to their jobs (Axelrad et al., 2018; Truxillo et al., 2017). We therefore expected different stereotypes to be associated with younger workers than with older workers, with the valence of the stereotypes corresponding to work performance ratings. Positive stereotypes would be evaluated as indicative of good expected work performance, and negative stereotypes would be judged as symbolic of poor expected work performance.

To examine the link between age stereotypes and work performance, we identified from the literature stereotypes that are commonly attributed to workers of different ages, which we refer to as 'previously-identified age stereotypes'. For example, "resistant to change" is a commonly held belief about older workers (Posthuma & Campion, 2009). We asked participants to assess the extent to which most people (as opposed to the participants themselves) associated each stereotype with workers of different ages (younger or older), and with different levels of expected work performance (poor or good). In this way, we assess whether a previously-identified age stereotype is indeed associated with its presumed age group, *and* whether any such age-related stereotypes is considered characteristic of good or

poor work performance. Thus, the primary goal of this study was to understand how age-related worker stereotypes converge with standards of expected work performance.

Method

Participants

A total of 257 participants were recruited through Amazon's Mechanical Turk platform, using CloudResearch software as a mediator (formerly TurkPrime; Litman et al., 2016). Survey access was restricted to residents of the United States, and those with a minimum approval ratings of 95% who had completed a minimum of 100 MTurk tasks. Further, each MTurk worker accessed the survey using a unique single-use key, thereby reducing the likelihood of completing the survey multiple times. After data collection, thirty-five responses were excluded from analyses using three empirically established careless responding indicators (e.g., instructed response; Cheung et al., 2017; Meade & Craig, 2012).

Among the final sample of 222 participants, the mean age was 36.4 years ($SD = 10.14$; range 18 to 72). The majority of participants reported that they were male (59.9%) and white (75.7%), and of varying highest levels of education (44.6% with a Bachelor's degree; 24.3% with a high school diploma; and with 20.3% technical degrees). Over half (55.4%) reported annual earnings between US\$15,600 and US\$51,999. Nearly half were in managerial or professional roles (48.2%); about a third (31.5%) were employed in community/personal services, clerical, or sales roles; and the remaining (20.3%) were in technical/trade, machinery, or laborer roles. Participants' job type did not appear to systematically or meaningfully affect their ratings of the survey items (see Appendix A)¹.

¹ We conducted one-way ANOVAs to explore whether the participants' job type affected item ratings in either the age or performance criteria. For parsimony, we clustered substantively similar occupations into three categories: (1) managers and professionals; (2) technicians, tradespeople, machinery operators, and laborers; and (3) community/personal services, clerical, and sales. Significantly different ratings were found for five-items in the age criterion and one in the work performance criterion, and mainly involved differences in ratings between the technicians et al. and the community/personal services et al. groups. Of note, managers and professionals rated only two items significantly different, in both cases lower than technicians et al.: $YW3_{age}$ ($M = 0.39$ vs. 1.14) and $OW7_{performance}$ ($M = -2.20$ vs. -1.58). Details of these analyses are reported in supplemental materials available at https://osf.io/dvjwp/?view_only=7540905ae3e3443aa8a1c8297f14883b (see Appendix A and output from these analyses).

Measures

To source age-related worker stereotypes, we initially consulted review manuscripts (Bal et al., 2011; Ng & Feldman, 2012; Postuma & Campion, 2009; Toomey & Rudolph, 2015). However, the bulk of this literature concerns older (and negative) worker stereotypes (Toomey & Rudolph, 2015; Truxillo et al., 2017) and thus the search was supplemented by exploratory research identifying younger and older worker stereotypes (Finkelstein et al., 2013). We labeled each stereotype as older worker (OW) or younger worker (YW), based on how each was described in the cited literature. Altogether, we compiled 124 age-related worker stereotypes, drafted descriptive statements from these, and then reviewed the statements to (a) remove obvious age cues, (b) improve clarity, (c) remove highly similar or duplicate statements, and (d) remove statements that were irrelevant to work. The resulting list of 86 common age-related worker stereotypes is presented in Table 1 (a complete list of stereotypes, including those that were modified, appears in Appendix B).

Procedure

Participants were asked to rate how common (i.e., what most people believe is true, not what the individual personally believes to be true) each potential stereotype was with respect to worker age and then, separately, with respect to expected work performance. Each rating was made on a 7-point scale from -3 to +3. For age, the scale was -3 (*strongly about younger workers*), 0 (*equally about younger and older workers*), +3 (*strongly about older workers*). For expected work performance, the scale was -3 (*strongly about poor performance*), 0 (*equally about poor and good performance*), and +3 (*strongly about good performance*). Participants could also indicate that a statement was not a stereotype commonly associated with age (or expected work performance). Order of criteria (age or performance) presentation was randomized, and statements within each criterion were presented in a pseudo-random order (i.e., item order randomized in each condition, then the

number of items evenly split between survey pages, with the order of the pages randomized; see Appendix C).² Complete instructions are reproduced in the project's online supplement (see Appendix D).

Results

Descriptive statistics for responses in each criterion (i.e., age and work performance) are shown in Table 1. For the age criterion, there was less agreement (i.e., mean ratings close to zero and large standard deviations) than expected for how the previously-identified age stereotypes mapped onto age groups. As an example, 'lacking drive' (item OW23) had previously been described as an older worker stereotype, but among our participants, the mean rating was -0.80 ($SD = 1.68$), with 55% associating 'lacking drive' with *younger* workers, and only 17.6% associating it with *older* workers. That is, this item was weakly regarded a *younger* worker stereotype, with considerable variability in the *age* criterion ratings. Further, there was also greater agreement (i.e., high absolute mean ratings and smaller standard deviations) about how the previously-identified age stereotypes mapped onto the performance criterion than onto the age criterion. To continue with our example of 'lacking drive', the mean rating on the performance criterion was ($M = -2.36$, $SD = 1.18$), with 91.9% of the participants indicating that 'lacking drive' is characteristic of poor performance. Overall, these results suggest that the previous-identified age stereotypes tended to be more strongly and clearly associated with work performance expectancies than they were with age.

To examine the relations of the previously-identified age stereotypes with both age and work performance, we plotted the mean age rating against the mean work performance rating for each item. These paired values, illustrated in Figure 1, largely cluster into four

² Immediately after providing the age criterion ratings, participants were asked to define the age someone (a) becomes an older worker, and (b) stops being a younger worker. The median age of older workers was 50 years, and 30 years for younger workers. We identified 25 outlier responses in the younger worker end age using the median absolute deviation (MAD) approach (Leys et al., 2013), which identified extreme values using the median rather than mean value, and selected the recommended moderately conservative criterion of $MAD + 2.5$ (i.e., > 40). Correlations between participant age and defined older and younger worker ages were not statistically significant (older worker: $r = .069$, $p = .306$; younger worker: $r = -.104$, $p = .145$). See Appendix C.

quadrants (described below). None of the items exhibited means with absolute values < 1.0 in relation to both age and work performance ratings, suggesting that our search yielded content that is stereotypically relevant to age and/or work performance. Twenty-two stereotypes were associated with older workers and poor performance (lower-right quadrant of Figure 1; e.g., OW5: “Are stubborn and stuck in their ways.”), and 24 were associated with older workers and good performance (upper-right quadrant; e.g., OW17: “Are wise”). There were 10 stereotypes associated with younger workers and good performance (upper-left quadrant; e.g., YW21: “Are savvy with technology”), and 30 associated with younger workers and poor performance (lower-left quadrant; e.g., YW14: “Act immature”).

Next, we examined how these previously-identified age stereotypes were classified in relation to their presumed age group. Figures 2 and 3 expound on the stereotype content of each paired rating. Figure 2 shows the ratings for 56 stereotypes that were believed to be associated with older workers, according to the source literature. Unexpectedly, 12 of these items were rated, to varying degrees, as stereotypes describing younger workers. Of those, 11 were also strongly associated with poor work performance (i.e., $M_{\text{performance}} < -1.50$). The remaining 44 items were rated as stereotypes describing older workers, with 18 being strongly associated with poor work performance, and 22 strongly associated with good work performance (i.e., $M_{\text{performance}} > 1.5$). Figure 3 shows the rating associated with previously-identified younger worker stereotypes. In this case, two items were rated, albeit weakly, as stereotypes describing *older* workers. The other 28 items were rated to some extent as stereotypes describing younger workers. Of those, 13 were also rated as strongly stereotypic of poor work performance, and six as strongly stereotypic of good work performance.

Supplemental analyses were conducted to explore any potential relationships between participant age and ratings made³. Overall, 22 of the age items (15 OW, 7 YW) and 7 of the

³ We thank the anonymous reviewer for this suggestion.

performance items (4 OW, 3 YW) were significantly, yet weakly (i.e., all $r < .30$), correlated with participant age (see supplementary materials). In terms of the age ratings, we see that stereotypes with a positive connotation have a positive correlation with rater age, and that stereotypes with a negative connotation have a negative correlation with rater age. Raters may have recognized these stereotypes as those used to describe individuals in their own age group, and therefore were influenced by their beliefs associated with their own identity. This corresponds with social identity theory's (Tajfel & Turner, 1979) proposition that individuals tend to view members of their in-group (e.g., people of similar age to self) in a more favorable way, and those in an out-group (e.g., people of different age than self) in a less favorable way. No clear age-based explanation was apparent for the seven performance items that were significantly correlated with age. The two positive relationships were for items with a high proportion of agreement that each was indicative of good performance (OW14: 95.5%, OW54: 77.0%). The five items with negative correlations were mixed in terms of the proportions that rated them as good or poor performance (OW35: 79.7% poor; OW44: 82.9% good; YW4: 54.1% good; YW10: 63.1% poor; YW28: 54.5% good).

Discussion

This study provides evidence that many common age-related worker stereotypes are also associated with stereotypic indicators of good, or poor, work performance expectancies. Although the relationship between age and performance stereotypes has previously been assumed in research and practice, it has never been explicitly tested. Further, it revealed that previously-identified age stereotypes were in fact more strongly and clearly indicative of stereotypic work performance than they were of workers' age. Altogether, the results offer insight into why workers' age may sometimes be negatively related with employment related decisions (Bal et al., 2011). That is, to the extent that a (potential) worker's age activates negative performance stereotypes, the opportunities afforded to that worker may be reduced.

Indeed, as noted by others (e.g., Truxillo et al., 2017), stereotypes generally have the greatest influence on individual beliefs when the individual does not have first-hand experience with the target of the stereotype, which is typical in the recruitment, selection, and socialization processes domains where the bulk of age stereotype research has focused.

Notably, we also found considerable variability in the extent to which previously-identified age stereotypes aligned with their presumed target; that is, several previously-identified older worker stereotypes were viewed as stereotypes describing *younger* workers, and vice versa. In some cases, the change in age ‘valence’ may be attributed to our rephrasing of some of the stereotypes to remove obvious age cues (e.g., “will retire soon” was changed to “will not stay in their jobs long term”). In most cases, however, the rephrasing was age neutral, and suggests that the target of age-related worker stereotypes may not be as obvious as commonly thought, highlighting an important contribution of this research. Details about which items were rephrased, and how, are in the supplemental materials.

We found some support for the depreciation model (Yeatts et al., 2000) ‘employee age-value’ association among the stereotypes rated as describing poor work performance and either younger or older workers. According to this model – which dominates throughout the business world – the perceived value of an employee is lower at earlier and later stages of the career lifespan, with peak value achieved in mid-career stages. However, we also found evidence supporting the conservation model (Yeatts et al., 2000) among stereotypes rated as descriptive of good performance and either age group. This perspective states that employees of all ages add value to an organization throughout their working lives, particularly with good management strategies and ongoing training and development. Indeed, some previously-identified age stereotypes were rated as indicative of good work performance, suggesting older and younger workers are believed to possess favorable characteristics valued by—and of value to—employers.

Given that our results revealed both positive and negative ratings, questions remain regarding the role stereotypes play in discriminatory outcomes (e.g., unfavorable hiring decisions, lack of advancement opportunities, or lower performance evaluation) for older workers (Bal et al., 2011). One possibility is that in employment contexts negative stereotypes carry more weight than positive stereotypes because they represent a ‘risky bet’ in relation to anticipated future work performance that outweighs confidence in potential performance benefits attributed to positive stereotypes. Future research could examine the relative importance of the positive and negative characteristics investigated here in making decisions using, for example, policy capture designs.

Although this study focused on descriptive age-based worker stereotypes (i.e., perceptions of what younger or older workers are like), prescriptive stereotypes could provide alternative sources of age bias in the work context, particularly young adults’ bias towards older adults. According to North and Fiske (2013), prescriptive stereotypes are age-biased beliefs of what older adults should or should not do in relation to succession (i.e., older adults should relinquish control of resources and work roles to younger adults), consumption (i.e., government spending and social services should not be disproportionately directed towards older adults), and identity (i.e., older adults should act their age). Whereas descriptive stereotypes operate when relatively little to no personal experience with the target has occurred (e.g., hiring phase), prescriptive stereotypes may function at later stages of employment when scarce resources (e.g., training or promotion opportunities) are allocated, especially if younger workers are responsible for the distribution of resources (North & Fiske, 2016), or during specific labor market conditions, such as when jobs are scarce or unemployment is high. Research on the association between prescriptive stereotypes and workplace age bias is sparse and warrants continued examination.

Practically speaking, the mapping of age-related worker stereotypes with stereotypic

work performance ratings could be used to investigate the roles of age stereotypes in workplace discrimination. For example, by avoiding age stereotype-loaded selection or performance criteria, or job requirements, researchers and practitioners could help hiring managers design selection practices that avoid stereotypes which may trigger negative performance expectations in evaluators. To illustrate, selection criteria of “high technological skills” may result in an older applicant being rated low in performance expectations because of the strong stereotype that older workers struggle with technology (see Figure 2), and a younger applicant being rated high in performance expectation because of the strong stereotype that younger workers are savvy with technology (see Figure 3).

Similarly, recruitment materials could be written to capitalize on stereotypes that are associated with positive age-related traits, or age-neutral traits (e.g., those with a mean age rating between -1 and +1 in Table 1), in an effort to attract qualified applicants of all ages. For example, theories such as attraction-selection-attrition (Schneider, 1987) propose that organizations will tend to attract new members who perceive similarities between their own characteristics and those of the organization. By promoting positive age and performance-based stereotypes, such as those identified in this study, in recruiting materials, organizations may be viewed as more attractive by older (or younger) workers. For example, such an organization could promote itself as a place where “role modelling and mentorship” is highly valued (OW 42 “Are good role models/mentors”). Future research should investigate the effectiveness of such strategies to reduce negative bias and discrimination. To that end, we have created a tool (see Appendix E) to aid researchers wishing to explore age-related worker stereotypes and work performance further. By connecting age-based worker stereotypes with stereotypically good or poor work performance, this study serves as a springboard for future efforts in the field of age-related worker stereotypes.

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Table 1

Descriptive Statistics for Previously-Identified Age Stereotypes Ratings on the Age and Work Performance Criteria.

	Age Criterion					Work Performance Criterion					
	<i>M</i>	<i>SD</i>	% rated as a younger worker stereotype (-3 to -1)	% rated as a older worker stereotype (1 to 3)	% rated as either both or neither age stereotype	<i>M</i>	<i>SD</i>	% rated as a <i>poor work</i> performance stereotype (-3 to -1)	% rated as a good work performance stereotype (1 to 3)	% rated as either both or neither work performance stereotype	
<i>Item number - Older worker stereotype</i>											
OW1 - Get flustered by fast-paced work	1.23	1.72	14.9	64.4	20.7	-1.91	1.36	87.8	5.0	7.2	
OW2 - Do not keep up with changing methods of work	1.75	1.44	6.3	82.9	10.8	-2.05	1.24	91.4	4.5	4.1	
OW3 - Rarely have creative/innovative ideas	1.02	1.65	12.2	52.7	35.1	-1.76	1.47	79.7	6.8	13.5	
OW4 - Get defensive when criticized/offered suggestions	-0.23	1.75	38.3	24.8	36.9	-1.89	1.24	82.9	3.6	13.5	
OW5 - Are stubborn and stuck in their ways	2.13	1.19	4.1	89.6	6.3	-1.63	1.46	75.7	5.9	18.5	
OW6 - Rely on outdated knowledge/methods	2.25	1.05	2.3	92.8	5.0	-1.61	1.40	74.8	5.9	19.4	
OW7 - Are not interested in learning new skills	1.62	1.44	8.1	77.0	14.9	-2.06	1.43	86.5	5.9	7.7	
OW8 - Have good attendance records	1.67	1.19	1.8	70.7	27.5	2.40	0.95	1.4	92.8	5.9	
OW9 - Are overly critical	1.06	1.60	11.7	58.1	30.2	-0.86	1.49	48.6	13.1	38.3	
OW10 - Really try to do their best	0.63	1.28	9.5	35.6	55.0	2.32	1.04	0.9	90.1	9.0	
OW11 - Are accident prone	0.15	1.71	27.0	33.8	39.2	-1.80	1.20	75.2	11.3	22.5	

OW12 - Have a strong work ethic	1.53	1.32	3.6	68.9	27.5	2.7	0.78	1.4	94.6	4.1
OW13 - Feel like they know it all	-0.51	2.02	47.7	28.4	23.9	-1.10	1.63	53.6	10.8	35.6
OW14 - Keep at a task until it is finished	0.95	1.40	7.2	52.3	40.5	2.55	0.92	1.4	95.5	3.2
OW15 - Struggle with decision making	-0.53	1.51	44.1	16.2	39.6	-1.78	1.40	84.2	5.9	9.9
OW16 - Are dependable	1.62	1.15	1.8	72.5	25.7	2.58	0.86	1.8	95.9	2.3
OW17 - Are wise	2.13	1.12	2.7	88.3	9.0	2.10	1.04	1.4	87.4	11.3
OW18 - Put a lot of effort into their work	0.77	1.30	5.4	40.5	54.1	2.41	1.22	3.6	91.4	5.0
OW19 - Are trustworthy	1.28	1.21	1.4	57.7	41.0	2.24	1.11	4.5	86.5	11.7
OW20 - Will not stay in their job long term	-1.58	1.54	78.4	9.5	12.2	-1.89	1.35	77.0	4.5	18.5
OW21 - Are costly for organizations to employ	0.90	1.68	15.3	51.8	32.9	-2.03	1.32	80.6	4.1	15.3
OW22 - Do not have a lot to offer	-0.22	1.63	28.8	20.7	50.5	-2.29	1.18	92.8	4.1	3.2
OW23 - Lack drive	-0.80	1.68	55.0	17.6	27.5	-2.36	1.18	91.9	3.6	4.5
OW24 - Are slow to complete tasks	1.15	1.54	12.6	63.5	23.9	-2.13	1.28	87.8	5.9	6.3
OW25 - Struggle with multitasking	1.12	1.62	13.1	62.6	24.3	-1.98	1.32	84.7	4.1	11.3
OW26 - Are not worth training	0.67	1.72	18.0	42.3	39.6	-2.36	1.18	89.6	3.2	7.2
OW27 - Are frequently absent from work	-1.16	1.50	60.8	11.7	27.5	-2.44	1.08	93.2	3.2	3.6
OW28 - Are resistant to change	2.12	1.22	4.5	87.4	8.1	-1.65	1.45	73.9	6.8	19.4
OW29 - Are competent	0.85	1.26	5.0	42.3	52.7	2.57	0.86	1.4	95.0	3.6
OW30 - Perform poorly	-0.37	1.38	32.4	14.0	53.6	-2.64	0.98	95.9	3.2	0.9
OW31 - Are difficult to develop professionally	-0.11	1.75	36.0	27.9	36.0	-2.08	1.29	84.7	5.4	9.9
OW32 - Are difficult to train	0.59	1.73	24.8	47.7	27.5	-2.21	1.08	89.6	3.2	7.2

OW33 - Are unmotivated to work hard	-1.24	1.53	65.3	10.4	24.3	-2.45	1.13	94.6	4.1	1.4
OW34 - Are unhealthy	1.11	1.52	10.4	52.7	36.9	-1.38	1.36	43.2	3.2	53.6
OW35 - Have personal issues that interfere with their work	-0.55	1.62	43.2	18.0	38.7	-1.75	1.44	79.7	5.4	14.9
OW36 - Are committed to their job	1.58	1.26	1.8	66.7	31.5	2.48	0.83	0.5	95.5	4.1
OW37 - Are honest	0.97	1.24	3.6	43.2	53.2	1.92	1.22	1.8	72.5	25.7
OW38 - Are knowledgeable about their workplace	1.54	1.30	3.6	71.2	25.2	2.39	0.96	0.9	92.3	6.8
OW39 - Are slow to learn	1.28	1.51	9.9	68.9	21.2	-2.03	1.31	86.5	4.5	9.0
OW40 - Are agreeable	0.40	1.37	16.2	30.6	53.2	1.56	1.34	2.7	67.6	29.7
OW41 - Are close minded	1.64	1.39	5.9	76.1	18.0	-1.79	1.31	75.2	4.1	20.7
OW42 - Are good role models/mentors	1.98	1.14	2.7	83.8	13.5	2.52	1.02	3.2	93.7	3.2
OW43 - Are patient	1.45	1.32	5.0	65.3	29.7	2.01	1.11	1.8	83.3	14.9
OW44 - Are supportive	1.10	1.23	4.1	54.5	41.4	2.07	1.08	0.9	82.9	16.2
OW45 - Are accident prone	-0.01	1.72	32.0	32.0	36.0	-1.78	1.19	70.7	2.3	27.0
OW47 - Require excessive work accommodations (e.g., changes in schedule or work environment)	0.41	1.84	25.7	44.1	30.2	-1.52	1.41	68.0	6.8	25.2
OW48 - Are bad tempered	0.07	1.66	26.6	29.3	44.1	-1.96	1.27	78.4	3.2	18.5
OW49 - Are highly skilled	1.03	1.36	6.8	50.9	42.3	2.55	1.00	2.7	92.8	4.1
OW50 - Are uncomfortable with technology	2.13	1.37	7.2	89.6	3.2	-1.57	1.60	71.2	7.2	21.6
OW51 - Are risk adverse	1.21	1.60	13.5	64.0	22.5	-0.23	1.46	28.8	20.3	50.9
OW52 - Are loyal workers	1.71	1.15	0.9	73.0	26.1	2.14	1.07	1.4	85.1	13.5
OW53 - Prioritize family ahead of work obligations	1.13	1.61	10.8	57.7	31.5	-0.54	1.40	36.5	9.9	53.6

OW54 - Are conscientious	0.92	1.33	8.1	52.7	39.2	1.97	1.28	3.6	77.0	19.4
OW55 - Are highly detail oriented	0.68	1.38	11.3	42.3	46.4	2.37	0.87	0.5	94.1	5.4
OW56 - Are financially secure	1.95	1.17	3.6	82.9	13.5	1.65	1.30	3.2	57.2	39.6
OW58 - Are organized	1.13	1.34	5.9	55.0	39.2	2.49	0.76	0.0	95.5	4.5
<i>Item number - Younger worker stereotype</i>										
YW1 - Are ambitious	-1.20	1.64	64.0	13.5	22.5	2.30	1.03	2.3	90.1	7.7
YW2 - Are eager	-1.42	1.42	77.0	8.6	17.1	2.02	1.07	1.8	86.0	12.2
YW3 - Work efficiently	0.54	1.39	15.3	38.7	45.9	2.69	0.72	0.9	97.7	1.4
YW4 - Seek immediate performance feedback	-1.13	1.34	56.3	6.3	37.4	0.88	1.62	14.4	54.1	31.5
YW5 - Are healthy	-1.21	1.42	56.8	5.9	37.4	1.30	1.34	2.3	39.6	58.1
YW6 - Are inexperienced	-2.27	1.21	91.9	4.1	4.1	-1.78	1.25	76.1	2.7	21.2
YW7 - Takes risks at work	-1.41	1.39	75.7	7.7	16.7	0.19	1.50	22.5	33.8	43.7
YW8 - Are unreliable	-1.45	1.31	73.9	5.4	20.7	-2.43	1.14	93.2	3.6	3.2
YW9 - Easily adapts to changes at work	-1.44	1.51	76.6	5.9	13.1	2.41	0.95	1.8	93.7	4.5
YW10 - Focus on having fun	-1.92	1.33	83.3	4.5	12.2	-1.34	1.60	63.1	8.6	28.4
YW11 - Are insubordinate	-1.49	1.35	73.0	6.3	20.7	-2.25	1.09	89.6	2.3	8.1
YW12 - Are outgoing	-1.09	1.42	55.9	7.2	36.9	1.12	1.27	2.3	47.3	50.5
YW13 - Are lazy	-1.24	1.39	66.7	7.7	25.7	-2.40	1.21	91.4	4.5	4.1
YW14 - Act immature	-2.09	1.27	89.2	5.0	5.9	-2.13	1.14	82.9	2.3	14.9
YW15 - Are self-centered	-1.28	1.55	63.5	10.8	25.7	-1.31	1.55	57.2	7.7	35.1
YW16 - Are insecure	-1.05	1.38	58.1	8.6	33.3	-1.71	1.33	68.5	3.6	27.9

YW17 - Are creative/innovative	-1.20	1.41	63.5	8.1	28.4	2.19	1.05	1.4	62.6	7.7
YW18 - Have a sense of entitlement	-1.07	1.95	63.5	15.8	16.7	-1.24	1.60	57.7	9.9	32.4
YW19 - Lack focus	-1.39	1.34	73.9	5.0	21.2	-2.25	1.14	93.7	3.6	2.7
YW20 - Are noisy	-1.61	1.48	70.3	7.7	22.1	-1.50	1.32	55.9	2.3	41.9
YW21 - Are savvy with technology	-2.31	1.31	91.0	5.0	4.1	2.04	1.22	3.2	82.0	14.9
YW22 - Are arrogant	-0.98	1.65	58.1	15.3	26.6	-1.25	1.57	56.8	11.7	31.5
YW23 - Are full of energy	-1.94	1.31	86.0	5.9	8.1	1.70	1.30	4.1	72.5	23.4
YW24 - Added value is insignificant	-0.05	1.59	20.7	20.3	59.0	-1.71	1.83	74.3	11.7	14.0
YW25 - Make rash decisions	-1.65	1.23	80.2	4.5	15.3	-1.88	1.27	83.3	3.6	13.1
YW26 - Behave recklessly	-1.83	1.25	82.9	4.1	13.1	-2.20	1.13	87.8	2.3	9.9
YW27 - Lack knowledge	-1.56	1.41	77.9	8.1	14.0	-2.11	1.28	88.7	4.5	6.8
YW28 - Are friendly	0.07	1.39	19.8	22.1	58.1	1.39	1.25	0.9	54.5	44.6
YW29 - Have bad manners	-1.50	1.37	67.6	5.0	27.5	-1.90	1.25	74.8	3.2	22.1
YW30 - Are inconsiderate	-1.23	1.42	60.8	8.1	31.5	-1.91	1.24	77.5	3.2	19.4

Notes: OW = older worker; YW = younger worker. The *M* and *SD* excludes those who indicated the item was not a stereotype about the target criterion (*N* range: 148 to 221 in age; 141 to 220 in work performance). Higher positive means indicate greater agreement that an item is a stereotype about older workers (age condition) or good work performance (performance condition). Lower negative means indicate greater agreement that an item is a stereotype about younger workers (age condition) or bad work performance (performance condition).

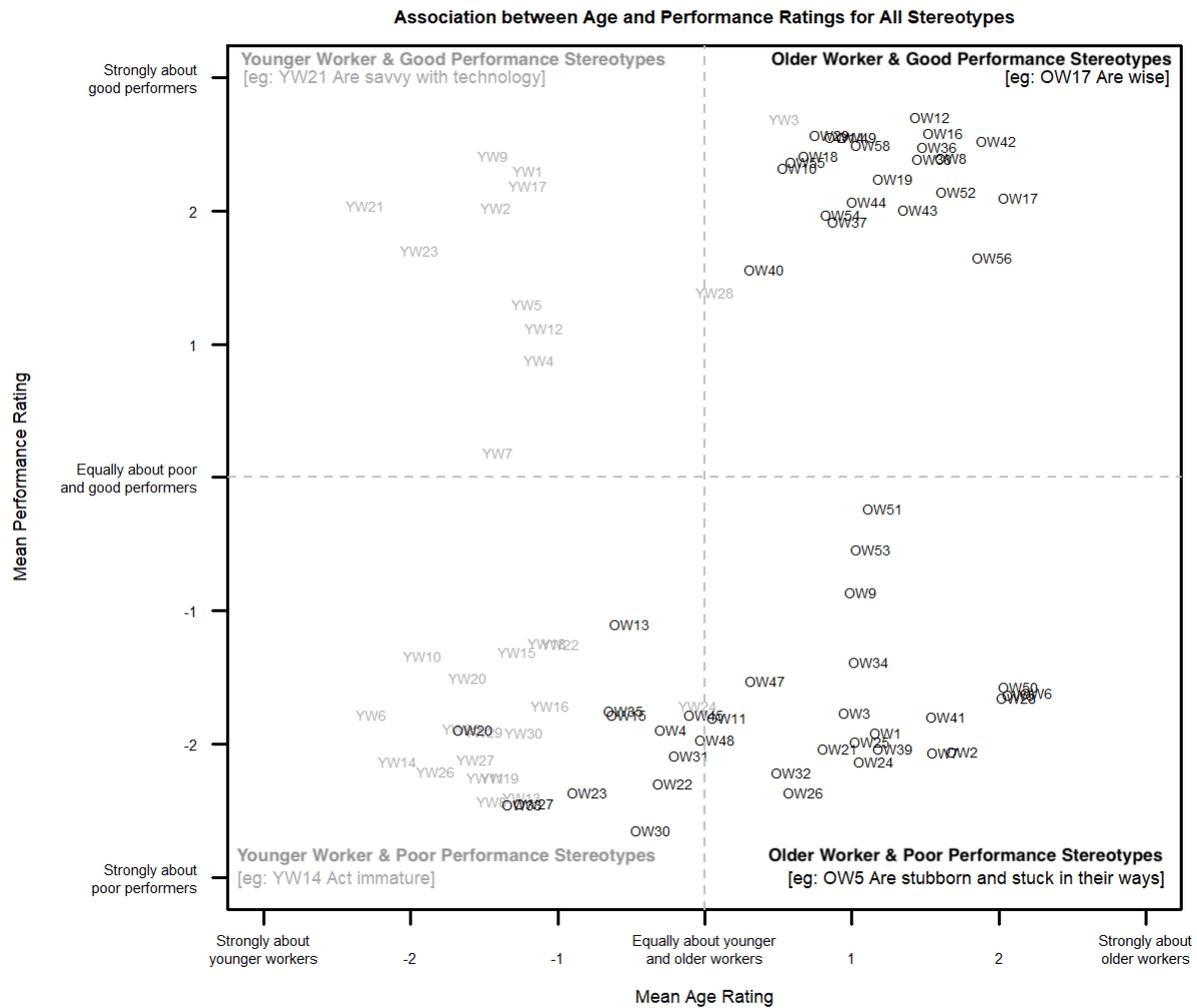


Figure 1. Overview of the associations between age and performance ratings for all age-based worker stereotypes, provided for illustrative purposes. Each label represents the paired (M_{age} , $M_{performance}$) coordinates. Labels in black denote stereotypes ascribed to older workers, and gray labels denote stereotypes ascribed to younger workers. An exemplar stereotype for each quadrant is given. (Note: Large format version of figure available with the project's online supplemental materials

https://osf.io/dvjwp/?view_only=7540905ae3e3443aa8a1c8297f14883b.)

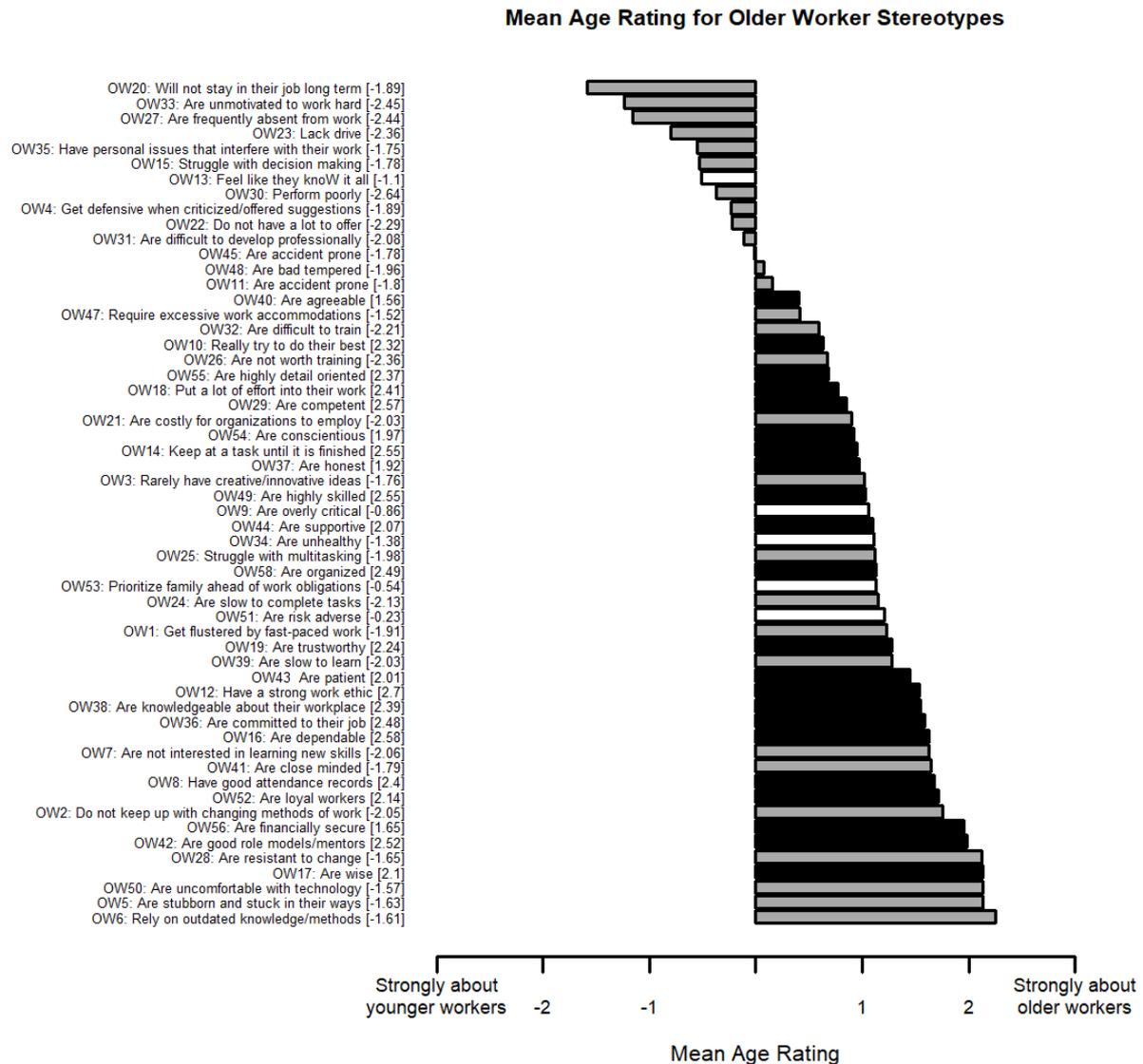


Figure 2. Previously-identified older worker stereotypes are listed in the figure above, ranked by mean age rating: from the stereotype most strongly associated with ‘younger workers’ at the top (i.e., OW20: ‘Will not stay in their job long term’) to the stereotype most strongly associated with ‘older workers’ at the bottom (i.e., OW6: ‘Rely on outdated knowledge/methods’). This information is also graphically depicted by bar length and direction. The mean performance rating associated with each previously-identified older worker stereotype is listed in square brackets next to each stereotype, with this information graphically depicted by the color of the bar: gray = poor performance ($M < -1.5$); black = good performance ($M > +1.5$); and white = all other mean performance values ($M > -1.5$ and $< +1.5$).

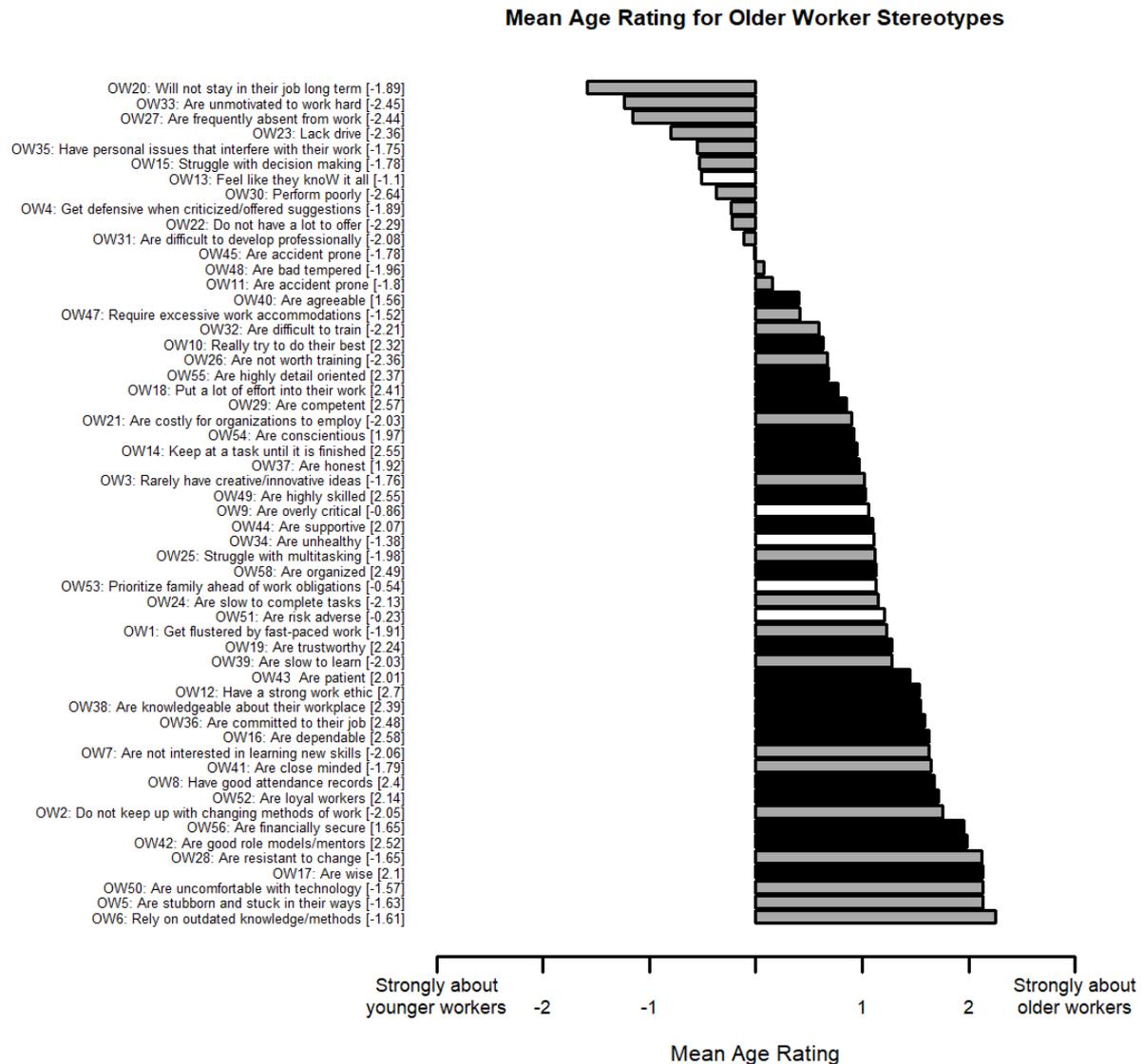


Figure 2. Previously-identified older worker stereotypes are listed in the figure above, ranked by mean age rating: from the stereotype most strongly associated with ‘younger workers’ at the top (i.e., OW20: ‘Will not stay in their job long term’) to the stereotype most strongly associated with ‘older workers’ at the bottom (i.e., OW6: ‘Rely on outdated knowledge/methods’). This information is also graphically depicted by bar length and direction. The mean performance rating associated with each previously-identified older worker stereotype is listed in square brackets next to each stereotype, with this information graphically depicted by the color of the bar: gray = poor performance ($M < -1.5$); black = good performance ($M > +1.5$); and white = all other mean performance values ($M > -1.5$ and $< +1.5$).

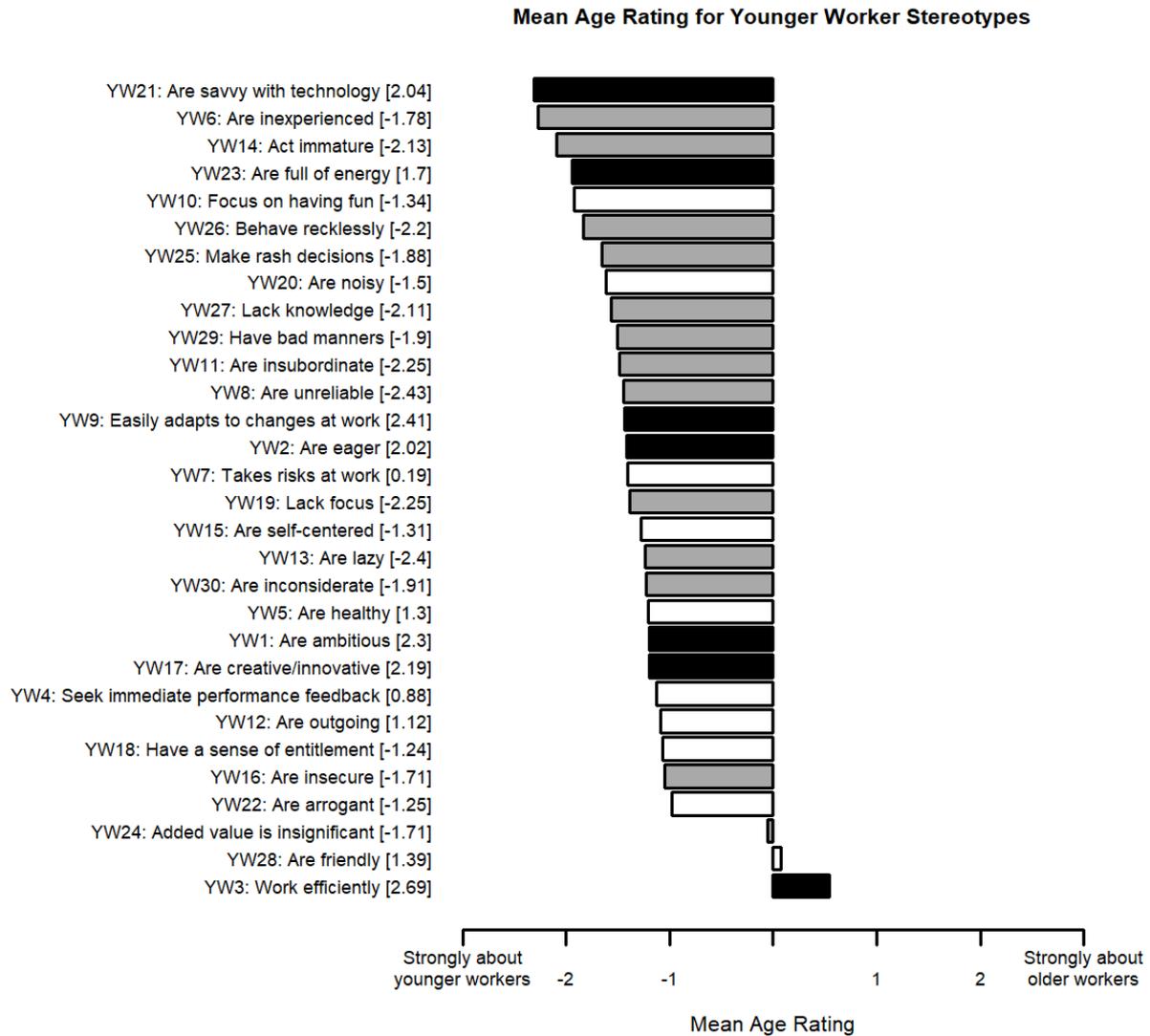


Figure 3. Previously-identified younger worker stereotypes are listed in the figure above, ranked by mean age rating: from the stereotype most strongly associated with ‘younger workers’ at the top (i.e., YW21: ‘Are savvy with technology’) to the stereotype most strongly associated with ‘older workers’ at the bottom (i.e., YW3: ‘Work efficiently’). This information is also graphically depicted by bar length and direction. The mean performance rating associated with each previously-identified younger worker stereotype is listed in square brackets next to each stereotype, with this information graphically depicted by the color of the bar: gray = poor performance ($M < -1.5$); black = good performance ($M > +1.5$); and white = all other mean performance values ($M > -1.5$ and $< +1.5$).

Older Workers and Poor Performance: Examining the Association of Age Stereotypes with
Expected Work Performance Quality

Supplemental Materials

Appendix A

Statistically Significant One-Way ANOVA Comparisons between Participant Professions in Average Ratings in Age and Work Criteria

Item	Overall Rating	Manager and Professional Rating (A)	Technician, Tradesperson, Machinery, and Laborer Rating (B)	Community/ Personal Services, Clerical, and Sales Ratings (C)
Age Ratings				
OW35: Have personal issues that interfere with their work*	-0.55 (1.73)	<i>ns</i>	-0.29 (1.73) ^C	-1.11 (1.25) ^B
OW38: Are knowledgeable about their workplace*	1.54 (1.30)	<i>ns</i>	2.00 (1.07) ^C	1.32 (1.48) ^B
OW58: Are organized*	1.13 (1.34)	<i>ns</i>	1.50 (1.09) ^C	0.79 (1.38) ^B
YW3: Work efficiently**	.54 (1.39)	0.39 (1.44) ^B	1.14 (1.28) ^{A,C}	0.36 (1.39) ^A
YW27: Lack knowledge*	-1.56 (1.41)	<i>ns</i>	-2.00 (1.15) ^C	-1.32 (1.50) ^B
Performance Ratings				
OW7: Are not interested in learning new skills*	-2.06 (1.43)	-2.20 (1.19) ^B	-1.58 (1.85) ^A	<i>ns</i>

Note: Only items where job-typed groups provided ratings that differed statistically significantly between groups are listed. Post-hoc tests were adjusted for multiple pairwise comparisons using the Bonferroni correction. Values listed are mean (standard deviation). Pairwise statistically significant differences denoted by superscript: A = managers and professionals; B = technicians, tradespeople, machinery, and laborers; C = community/personal services, clerical, and sales. * $p < .05$; ** $p < .01$; *ns* = not statistically significantly different.

SPSS output for these analyses available at

https://osf.io/dvjwp/?view_only=7540905ae3e3443aa8a1c8297f14883b

Appendix B

Age stereotypes identified in the literature and phrasing used in this study

Notes: Variables that begin with “OW” are older worker stereotypes, and “YW” are younger worker stereotypes, as identified in the source literature. Bolded items were rephrased for this study.

Variable Name	Age stereotypes from literature	Phrasing used in study
OW1	Get rattled when they are rushed	Get flustered by fast-paced work
OW2	Do not keep up with changing methods of work	Do not keep up with changing methods of work
OW3	Rarely have creative/innovative ideas	Rarely have creative/innovative ideas
OW4	Get defensive when criticized/offered suggestions	Get defensive when criticized/offered suggestions
OW5	Are stubborn and stuck in their ways	Are stubborn and stuck in their ways
OW6	Need training and development	Rely on outdated knowledge/methods
OW7	Are not interested in learning new skills	Are not interested in learning new skills
OW8	Have good attendance records	Have good attendance records
OW9	Are critical of their fellow workers	Are overly critical
OW10	Really try to do their best	Really try to do their best
OW11	Have accidents at work	Are accident prone
OW12	Have a strong work ethic	Have a strong work ethic
OW13	Feel like they know it all	Feel like they know it all
OW14	Keep at a task until it is finished	Keep at a task until it is finished
OW15	Have difficulty making decisions	Struggle with decision making
OW16	Are dependable	Are dependable
OW17	Are wise	Are wise
OW18	Put a lot of effort into their work	Put a lot of effort into their work
OW19	Are trustworthy	Are trustworthy
OW20	Are likely to leave their jobs in the next three years	Will not stay in their job long term
OW21	Are costly for organizations to employ	Are costly for organizations to employ
OW22	Do not have a lot to offer	Do not have a lot to offer
OW23	Lack motivation to work	Lack drive
OW24	Are slow to complete tasks	Are slow to complete tasks
OW25	Struggle with multitasking	Struggle with multitasking
OW26	Are not worth training	Are not worth training
OW27	Require more days off work	Are frequently absent from work
OW28	Are resistant to change	Are resistant to change
OW29	Are competent	Are competent
OW30	Perform poorly	Perform poorly
OW31	Are difficult to develop professionally	Are difficult to develop professionally
OW32	Are difficult to train	Are difficult to train
OW33	Are unmotivated to work hard	Are unmotivated to work hard
OW34	Are unhealthy	Are unhealthy
OW35	Have personal issues that interfere with their work	Have personal issues that interfere with their work
OW36	Are committed to their job	Are committed to their job
OW37	Are honest	Are honest
OW38	Are knowledgeable about their workplace	Are knowledgeable about their workplace
OW39	Are slow to learn	Are slow to learn
OW40	Are agreeable	Are agreeable
OW41	Are close minded	Are close minded
OW42	Are good role models/mentors	Are good role models/mentors
OW43	Are patient	Are patient
OW44	Are supportive	Are supportive
OW45	Are accident prone	Are accident prone

OW47	Require excessive work accommodations (e.g., changes in schedule or work environment)	Require excessive work accommodations (e.g., changes in schedule or work environment)
OW48	Are bad tempered	Are bad tempered
OW49	Accomplished	Are highly skilled
OW50	Technophobic	Are uncomfortable with technology
OW51	Conservative	Are risk adverse
OW52	Faithful	Are loyal workers
OW53	Family oriented	Prioritize family ahead of work obligations
OW54	Highly concerned for others	Are conscientious
OW55	High attention to detail	Are highly detail oriented
OW56	Wealthy	Are financially secure
OW58	Clean/organized	Are organized
YW1	Are ambitious	Are ambitious
YW2	Are eager	Are eager
YW3	Work efficiently	Work efficiently
YW4	Seek immediate performance feedback	Seek immediate performance feedback
YW5	Healthy	Are healthy
YW6	Inexperienced	Are inexperienced
YW7	Risk taker	Takes risks at work
YW8	Tardy	Are unreliable
YW9	Adaptable	Easily adapts to changes at work
YW10	Pleasure driven	Focus on having fun
YW11	Rebellious	Are insubordinate
YW12	Sociable	Are outgoing
YW13	Lazy/unmotivated	Are lazy
YW14	Immature	Act immature
YW15	Selfish	Are self-centered
YW16	Self-conscious	Are insecure
YW17	Innovative/creative	Are creative/innovative
YW18	Entitled/spoiled	Have a sense of entitlement
YW19	Unfocused	Lack focus
YW20	Loud	Are noisy
YW21	Tech savvy	Are savvy with technology
YW22	Arrogant	Are arrogant
YW23	Nimble	Are full of energy
YW24	Adds no value	Added value is insignificant
YW25	Rash decision making	Make rash decisions
YW26	Reckless behavior	Behave recklessly
YW27	Unknowledgeable	Lack knowledge
YW28	Happy	Are friendly
YW29	Impolite/unhelpful	Have bad manners
YW30	Inconsiderate	Are inconsiderate

Appendix C

Statistically Significant Correlations Between Rater Age and Item Ratings

Item	<i>r</i>
AGE RATINGS	
OW12: Have a strong work ethic	.279***
OW13: Feel like they know it all	-.155*
OW14: Keep at a task until it is finished	.228**
OW16: Are dependable	.224**
OW18: Put a lot of effort into their work	.170*
OW19: Are trustworthy	.184*
OW29: Are competent	.163*
OW33: Are unmotivated to work hard	-.177*
OW35: Have personal issues that interfere with their work	-.150*
OW43: Are patient	.190**
OW44: Are supportive	.170*
OW51: Are risk adverse	.141*
OW52: Are loyal workers	.144*
OW54: Are conscientious	.279***
OW58: Are organized	.188**
YW3 Work efficiently	.145*
YW5: Are healthy	-.227*
YW11: Are insubordinate	-.191**
YW14: Are immature	-.173*
YW15: Are self-centered	-.228**
YW16: Are insecure	-.163*
YW30: Are inconsiderate	-.165*

PERFORMANCE RATINGS

OW14: Keep at a task until it is finished	.133*
OW35: Have personal issues that interfere with their work	-.151*
OW44: Are supportive	-.177*
OW54: Are conscientious	.252***
YW4: Seek immediate performance feedback	-.190**
YW10: Focus on having fun	-.150*
YW28: Are friendly	-.221**

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

Appendix D

Survey Instructions

General instructions

In the following pages you will be presented with a number of statements that may depict stereotypes about different groups of workers. A stereotype is a belief that a characteristic or behaviour is common for all members of a group of people (e.g., gender, age, and ethnic groups). We are interested in which stereotypes you believe are commonly held about different groups of workers, NOT whether you *personally* think each stereotype is true. In other words, please indicate what you think most people believe is true about each group as a whole. You will rate all statements for one group at a time. Instructions at the top of each page will indicate the group you should consider when rating the statements.

Age condition instructions

Please carefully read each statement below and indicate to what extent each statement is a stereotype commonly held about workers of different AGE GROUPS (i.e., younger workers vs. older workers). If you feel a statement is a stereotype about younger workers select one of the options to the left. Selecting the option furthest to the left indicates you feel this is a very common/widely held stereotype about younger workers, selecting -1 indicates that you feel this is an uncommonly held stereotype about younger workers, and selecting -2 indicates you feel this is more common. If you feel the statement is a stereotype held about older workers, click one of the options to the right. Selecting the option furthest to the right indicates you feel this is a very common/widely held stereotype about older workers, selecting the 1 indicates you feel this is an uncommonly held stereotype about older workers, and selecting 2 indicates you feel this is more common. If you feel a statement is a stereotype held about both younger and older workers, select the option in the middle. Finally, if you feel the statement does not apply as a stereotype to either of the groups (i.e., does not apply to younger workers and does not apply to older workers), select the option “not a stereotype about age.”

Performance condition instructions

Please carefully read each statement below and indicate to what extent each statement is a stereotype commonly held about workers of different PERFORMANCE GROUPS (i.e., poor performance workers vs. good performance workers). If you feel a statement is a stereotype about poor performance workers, select one of the options to the left. Selecting the option furthest to the left indicates you feel this is a very common/widely held stereotype about poor performance workers, selecting -1 indicates that you feel this is an uncommonly held stereotype about poor performance workers, and selecting -2 indicates you feel this is more common. If you feel the statement is a stereotype held about good performance workers, click one of the options to the right. Selecting the option furthest to the right indicates you feel this is a very common/widely held stereotype about good performance workers, selecting the 1 indicates you feel this is an uncommonly held stereotype about good performance workers, and selecting 2 indicates you feel this is more common. If you feel a statement is a stereotype held about both poor performance workers and good performance workers, select the option in the middle. Finally, if you feel the statement does not apply as a stereotype to either of the groups (i.e., does not apply to poor performance workers and does not apply to good performance workers), select the option “not a stereotype about performance.”

Rating Example (For Age Criterion)

	Strongly about younger workers -3	-2	-1	About both younger and older workers 0	+1	+2	Strongly about older workers 3	Not a stereotype about age (missing)
<i>Statement</i>								

Appendix E

Interactive Excel Table for Selecting Attributes/Traits

Objective

The interactive excel table provides the mean age and performance ratings associated with each previously-identified age-related worker stereotype. Researchers and practitioners can easily sort this list by either the mean age rating or the mean performance rating, to identify appropriate items/stereotypes/attributes that could be used, for example, in recruitment or marketing materials so as to either avoid potentially discriminatory stereotypes (e.g., stereotypes associated with older workers and poor performance), or to selected attributes that could be used for targeted recruiting (e.g., age-related traits that are associated with good performance).

Tool available at: https://osf.io/dvjwp/?view_only=7540905ae3e3443aa8a1c8297f14883b

Label	Item	N - Age rating	M - Age rating	SE - Age rating	N - Performance rating	M - Performance rating	SE - Performance rating
OW1	OW1 "Get Flustered by fast-paced work"	201	1.23	0.121	219	-1.91	0.092
OW2	OW2 "Do not keep up with changing methods at work"	219	1.75	0.097	219	-2.05	0.084
OW3	OW3 "Rarely have creative/innovative ideas"	182	1.02	0.122	210	-1.76	0.102
OW4	OW4 "Get defensive when criticized/offered suggestions"	196	-0.23	0.125	215	-1.89	0.085
OW5	OW5 "Are stubborn and stuck in their ways"	218	2.13	0.081	206	-1.63	0.101
OW6	OW6 "Rely on outdated knowledge/methods"	221	2.25	0.071	203	-1.61	0.098
OW7	OW7 "Are not interested in learning new skills"	211	1.62	0.099	216	-2.06	0.097
OW8	OW8 "Have good attendance records"	199	1.67	0.084	220	2.4	0.064
OW9	OW9 "Are overly critical"	193	1.06	0.115	194	-0.86	0.107
OW10	OW10 "Really try to do their best"	187	0.63	0.094	220	2.32	0.07