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Generational Differences in Attitudes and Knowledge about Workers Who Are Blind or Have Low Vision

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Negative attitudes toward people with disabilities have persisted for centuries (Munyi, 2012). Trends in attitudes toward disability from the mid-2000s to the mid-2010s indicate that although explicit (self-reported) attitudes became more positive over time, implicit (unconscious) attitudes remained negative or became more negative (Charlesworth & Banaji, 2019; Harder et al., 2019). Attitudes toward individuals with blindness or low vision (i.e., visual impairments) are often more negative than attitudes toward people with other disabilities, particularly in terms of considering them for employment (Goodman et al., 2024; Kalargyrou et al., 2021; Zissi et al., 2007).

Diversity and inclusion movements in hiring have become popular strategies to diversify the workplace, yet disability is often not included in these movements (Gould et al., 2022). Generation Z (Gen Z, those born after 1996), characterized by their freedom of expression, inclusivity, and human rights activism, has been credited as the driving force behind social pressures for inclusion (Francis & Hoefel, 2018; Team, 2022). They are more supportive of companies that advertise diversity and inclusion and are more likely to apply to work for companies that support these initiatives (Team, 2022). Despite the longevity of negative attitudes toward people with disabilities, there may have been a change in perception of disability among Gen Z: compared to older generations, Gen Z exhibited less implicit bias against disability (Charlesworth & Banaji, 2019). In another study comparing a younger cohort (mostly Gen Z age) and an older cohort (ages 65-80), the younger cohort exhibited less implicit bias against people wearing hearing aids (Beadle et al., 2024) – considered a proxy for hearing loss. To date, no studies have investigated generational attitude differences toward employees with visual impairments. Therefore, the purpose of this study was to compare implicit and explicit attitudes

and knowledge of older hiring managers and future hiring managers about workers with visual impairments. We investigated the question: *Are there differences in attitudes toward and knowledge about people with visual impairments as employees between Generation Z and older generational cohorts?*

Method

Participants and Data Collection

Our two groups of participants came from separate data collection efforts which were part of larger studies. One group were future hiring managers – university students aged 26 and younger (Gen Z) enrolled in human resources management classes. The other group were hiring managers aged 45 and older (older generational cohorts) who were involved in making hiring decisions for their organizations.

Future Hiring Managers

Future hiring managers were university students who were enrolled in junior-level human resources management classes in January 2023. The study was reviewed and approved by the authors' university Institutional Review Board. Data was collected in person in computer labs using an online survey platform. Students were invited by their professor to participate in the study for class credit; 177 students were eligible and invited to participate and 166 provided informed consent and began the study. Data cleaning involved the removal of students who were over the age of 26, responded incorrectly to attention check items, didn't complete the study, or had missing data, resulting in a sample of 156. A slight majority of managers-in-training were female (51.3%, $n = 80$) and sample ages ranged from 18 to 26 ($M = 20.98$, $SD = 1.28$).

Hiring Managers

Data was collected from hiring managers virtually in May through July of 2017 using an online survey platform. The study was reviewed by the authors' university Institutional Review Board and granted an exempt determination. Hiring managers were identified through a market research company, Research Now, that manages a business-to-business research panel. Research Now sent email invitations to their panel members who met the inclusion criteria (i.e., U.S. resident and in a management position or a business owner). Informed consent was obtained at the beginning of the survey. The survey included two screening questions; one to confirm being involved in hiring decisions, and another that served as an attention check; 464 participants passed the screening questions and completed the survey. Data cleaning involved disqualifying respondents who spent less than 5 minutes completing the survey or provided nonsensical answers to open-ended items, resulting in 388 participants. From this group, we further limited the study sample to hiring managers who (a) were aged 45 and over (only age group data was available, thus we restricted this sample to Generation X or older cohorts), (b) had no missing data, and (c) had not previously hired someone with a visual impairment or had an employee who began losing their sight (to remove managers with experience working with visually impaired people). A final sample of 228 hiring managers remained. The majority of hiring managers were male (68.0%, $n = 155$). Their ages were reported as categories, with the lowest category 45 to 54 and the upper category 75 or older. Table 1 lists hiring managers' age groups and corresponding generational cohort (Dimock, 2019).

Measures

IAT-BVI

Implicit association tests (IATs) measure the implicit or unconscious bias that a person may have about a particular group as it relates to a particular attribute. For example, one might

test whether a person has a bias about which gender group is associated with the attribute of a science career. IATs work by using a timed sorting task for images or words related to the group or attribute, assuming that a faster response time for sorting two stimuli together (e.g., male, science) indicates a stronger mental association and thus a bias in that direction. The IAT-BVI (Implicit Association Test – Blind/Visually Impaired) was developed as an IAT of bias regarding a person's vision status (blind, sighted) related to competence (competent, incompetent). In the IAT-BVI, the group categories *blind* and *sighted* are represented by four images each of blind and sighted individuals in natural settings. The associated attributes competence and incompetence are represented by four each of positive and negative words relating to work competence (e.g., productive, inefficient). More information about the original design and development of the IAT-BVI can be found in McDonnall & Antonelli (2018). Scores on the IAT-BVI (D scores) were calculated for each participant using the revised scoring algorithm developed by the creators of the IAT (Greenwald et al., 2003). D scores range from – 2 to 2, with positive values indicating more bias (i.e., a stronger association between blind/incompetent than blind/competent).

Employer Attitudes Toward Blind Employees Scale

The Employer Attitudes Toward Blind Employees Scale (EABES; McDonnall, 2014, 2017) is a measure of explicit attitudes about employing people who are blind. It has 11 items that form two subscales related to productivity and challenges. Items are statements that participants rate their level of agreement with on a 7-point scale. The two subscales have high reliability, with Cronbach's alpha for productivity at 0.92 and for challenges at 0.84, and scale validity has been supported by confirmatory factor analyses (McDonnall, 2017; McDonnall & Cmar, 2022). Scores range from 0 to 66, with higher scores indicating more positive attitudes.

Work Task Knowledge

We utilized five questions to assess participant knowledge about how a person with a visual impairment could perform common work tasks. Participants were asked if they knew of any way a visually impaired person could accomplish specific tasks in the workplace (e.g., access pre-printed material; access a computer to use the internet, email, or computer software). Participants who responded *yes* were asked to provide details about how the person could complete the task. Participant responses were rated for accuracy using an established coding rubric for these items based on previous studies (McDonnall et al., 2014; McDonnall & Crudden, 2018). The coding rubric was updated as needed to reflect technological advancements. Three researchers coded the participant responses independently, and then discussed any discrepancies until consensus was reached. The items form a knowledge measure with a possible range of 0 to 10, with each item receiving zero for an incorrect or no answer, one point for partially correct answers, and two points for completely correct answers.

Data Analysis

We utilized SAS 9.4 for data preparation, to generate descriptive statistics, and to compare scores of the two groups on the measures of interest using two-sample t-tests. Cohen's *d* was used as a measure of effect size.

Results

Two-sample *t*-tests were performed to compare implicit and explicit attitude scores for future hiring managers (Gen Z) and hiring managers (older generational cohorts). There was a significant difference in IAT-BVI scores between the groups, with Gen Z having more positive implicit attitudes toward people with visual impairments ($M = 0.60$, $SD = 0.43$) than adults in older generational cohorts ($M = 0.77$, $SD = 0.40$), $t(382) = 4.08$, $p < .0001$, Cohen's $d = 0.42$. The

difference between the two groups approached significance on the EABES, with the older generation cohorts group (M = 32.87, SD = 12.18) having a slightly more positive attitude towards people with visual impairments than Gen Z (M = 30.67, SD = 11.13) on the explicit attitude measure, $t(382) = 1.80$, p =.07, Cohen's d = .19.

A two-sample t-test was performed to compare the knowledge measure scores of Gen Z to the older generational cohorts. Both groups' knowledge level related to accommodations and strategies people with visual impairments utilize to complete common work tasks was low. Gen Z had slightly lower knowledge levels about how people with visual impairments can perform work tasks (M = 0.63, SD = 1.27) than hiring managers in older generational cohorts (M = 0.96, SD = 1.67), $t(377.67) = 2.18$, p = .03, Cohen's d = .22.

Discussion

The purpose of this study was to evaluate differences in attitudes and knowledge about workers with visual impairments based on generational cohort – specifically Gen Z compared to older cohorts. Gen Z participants were university students in management classes and older generational cohort participants were hiring managers for their organizations. We found that Gen Z participants' implicit bias about the competence of visually impaired people was significantly lower (more positive) than the implicit bias of hiring managers from older generational cohorts. The difference between the groups represents a small-to-medium effect. This finding coincides with Charlesworth and Banaji's (2019) finding of better implicit attitudes towards people with disabilities by Gen Z compared to older cohorts, particularly Gen Xers and Baby Boomers. However, the slightly higher (more positive) explicit attitude scores of older generation hiring managers towards workers with visual impairments were not significantly different from Gen Z

student scores. It is possible that hiring managers were more likely to respond to the explicit attitude measure in a socially desirable way given laws prohibiting discrimination in hiring.

Despite having more favorable implicit attitudes about the competence of people with visual impairments, Gen Z students had lower knowledge levels about how visually impaired people perform work tasks compared to older generational cohorts. Hiring managers' slightly higher knowledge may be associated with having more exposure to people with visual impairments over their lifetimes. A previous study documented the association between greater knowledge about performance of work tasks and better implicit attitudes among hiring managers (McDonnall & Antonelli, 2018). Yet in this study, Gen Z participants had better implicit attitudes despite having more limited knowledge.

Of note is that 30.3% of the Gen Z participants were knowledgeable about how people with visual impairments use smartphones (a question that was not asked of the hiring managers). Smartphones are used by people with visual impairments throughout their day, including at work, for many tasks (Martiniello et al., 2022; McDonnall et al., 2023). The built-in accessibility of smartphones, which started with the iPhone in 2009, has been vital to afford people with visual impairments the same opportunities and conveniences that the phones provide everyone else. The Gen Z cohort grew up with smartphones and use them extensively, making them an integral – and often perceived as indispensable – part of their lives (Mason et al., 2022). Knowledge that people with visual impairments are able to use smartphones, given their potential value and multiple uses, may have positively influenced students' unconscious attitudes about their competence.

The results presented here add to a small body of literature documenting lower implicit bias toward people with disabilities among younger people (Beadle et al., 2024; Charlesworth &

Banaji, 2019). Our findings are encouraging for the future employment of people with visual impairments. This Gen Z cohort of future hiring managers had more positive implicit attitudes (less bias) about the competence of people with visual impairments, which may equate to greater openness to hiring them. While these findings are positive, it is important to put the results in context. Although Gen Z participants had significantly lower implicit attitude scores than hiring managers from older generational cohorts, they do exhibit implicit bias about the competence of people with visual impairments. Their average score of 0.60 equates with a moderate level of implicit bias; this compares to a moderate level of implicit bias (average score 0.47) toward people with disabilities exhibited by Gen Zers in 2016 (Charlesworth & Banaji, 2019).

The level of knowledge for both Gen Z students and hiring managers was low, with a mean score below 1 for both groups. The mean scores can be interpreted thus: on average, hiring managers had partial knowledge about how people with visual impairments can perform one of the five tasks, and approximately two of every three students had partial knowledge about how people with visual impairments can perform one of the tasks. Research indicates that greater knowledge is associated with better explicit and implicit attitudes about people with visual impairments (McDonnall & Antonelli, 2018; McDonnall & Cmar, 2022). Therefore, this finding suggests that education about blindness and particularly about how visually impaired people can perform work tasks and function effectively in jobs is needed for people who make hiring decisions.

A primary limitation of this study should be acknowledged: the difference in the age of the data. The hiring managers' data was collected more than five years earlier than the student data; thus, we cannot be certain whether the differences observed in hiring managers' and students' scores were related to the timing of the data collection. If overall societal attitudes

about the competence of people with visual impairments improved between 2017 and 2023 (a period effect), the differences observed in the study could be associated with that rather than generational differences (a cohort effect) as we suspect. Charlesworth and Banaji (2019) assert that three potential causes of change (period effect, cohort effect, and age effect) in data such as this cannot be isolated from one another, and we acknowledge this as a limitation of the study. While our findings suggest a generational cohort effect, they could also suggest societal changes in how people perceive the competence of visually impaired people. Another limitation is the lack of hiring manager data regarding knowledge about how people with visual impairments use smartphones; at the time of that study, use of smartphones was not part of the Work Task Knowledge measure. Given that our study utilized existing data from two studies that were conducted more than five years apart, research with data collected at the same time from different generational cohorts is needed to confirm our findings. This would be an interesting avenue for future research.

References

Beadle, J., Jenstad, L., Cochrane, D., & Small, J. (2024). Perceptions of older and younger adults who wear hearing aids. *International Journal of Audiology*, 1–9. https://doi.org/10.1080/14992027.2024.2305279

Charlesworth, T. E. S., & Banaji, M. R. (2019). Patterns of implicit and explicit attitudes: I. Long-term change and stability from 2007 to 2016. *Psychological Science*, *30*(2), 174–192. https://doi.org/10.1177/0956797618813087

Dimock, M. (2019, January 17). Defining generations: Where Millennials end and Generation Z begins. Pew Research Center. *Pew Research Center*. https://www.pewresearch.org/short-reads/2019/01/17/where-millennials-end-and-generation-z-begins/

Francis, T., & Hoefel, F. (2018). *'True Gen': Generation Z and its implications for companies*. McKinsey & Company. https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/true-gen-generation-z-and-its-implications-for-companies#/

Goodman, N., Deane, S., Hyseni, F., Soffer, M., Shaheen, G., & Blanck, P. (2024). Perceptions and bias of small business leaders in employing people with different types of disabilities. *Journal of Occupational Rehabilitation*. https://doi.org/10.1007/s10926-024-10201-2

Gould, R., Mullin, C., Harris, S. P., & Jones, R. (2022). Building, sustaining and growing: Disability inclusion in business. *Equality, Diversity and Inclusion*, *41*(3), 418–434. https://doi.org/10.1108/EDI-06-2020-0156

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the implicit association test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology*, *85*(2), 197–216. https://doi.org/10.1037/0022-3514.85.2.197

Harder, J. A., Keller, V. N., & Chopik, W. J. (2019). Demographic, experiential, and temporal variation in ableism. *Journal of Social Issues*, *75*(3), 683–706. https://doi.org/10.1111/josi.12341

Kalargyrou, V., Pettinico, W., & Chen, P.-J. (2021). Attitudes toward people with physical disabilities: An examination of social context, discipline, disability type, and demographics. *Journal of Vocational Rehabilitation*, *54*, 117–132. https://doi.org/10.3233/JVR-201124

Martiniello, N., Eisenbarth, W., Lehane, C., Johnson, A., & Wittich, W. (2022). Exploring the use of smartphones and tablets among people with visual impairments: Are mainstream devices replacing the use of traditional visual aids? *Assistive Technology*, *34*(1), 34–45. https://doi.org/10.1080/10400435.2019.1682084

Mason, M. C., Zamparo, G., Marini, A., & Ameen, N. (2022). Glued to your phone? Generation Z's smartphone addiction and online compulsive buying. *Computers in Human Behavior*, *136*, 1–13. https://doi.org/10.1016/j.chb.2022.107404

McDonnall, M. C. (2014). Employer attitudes toward blind or visually impaired employees: Initial development of a measurement instrument. *Rehabilitation Counseling Bulletin*, *58*(1), 29–36. https://doi.org/10.1177/0034355213504140

McDonnall, M. C. (2017). Additional evidence for the validity of the employer attitudes toward blind employees scale. *Rehabilitation Counseling Bulletin*, *60*(3), 155–162. https://doi.org/10.1177/0034355216642598

McDonnall, M. C., & Antonelli, K. (2018). Employers' implicit attitudes about the competence of people who are blind. *Rehabilitation Psychology*, *63*(4), 502–511. https://doi.org/10.1037/rep0000235

McDonnall, M. C., & Cmar, J. L. (2022). Structural relationships among predictors of employer attitudes toward blind employees. *Journal of Vocational Rehabilitation*, *57*(1), 73–84. https://doi.org/10.3233/JVR-221200

McDonnall, M. C., & Crudden, A. (2018). Predictors of employer attitudes toward blind employees, revisited. *Journal of Vocational Rehabilitation*, *48*(2), 221–231. https://doi.org/10.3233/JVR-180933

McDonnall, M. C., O'Mally, J., & Crudden, A. (2014). Employer knowledge of and attitudes toward employees who are blind or visually impaired. *Journal of Visual Impairment & Blindness*, *108*(3), 213–225. https://doi.org/10.1177/0145482X1410800305

McDonnall, M. C., Steverson, A., Sessler Trinkowsky, R., & Sergi, K. (2023). Assistive technology use in the workplace by people with blindness and low vision: Perceived skill level, satisfaction, and challenges. *Assistive Technology*, 1–8. https://doi.org/10.1080/10400435.2023.2213762

Munyi, C. (2012). Past and present perceptions towards disability: A historical perspective. *Disability Studies Quarterly*, *32*(2). https://dsq-sds.org/index.php/dsq/article/view/3197/3068

Team, F. (2022, June 10). Gen Z on disability: How young people are challenging ableism. *Fanbytes*. https://fanbytes.co.uk/gen-z-disability-ableism/

Zissi, A., Rontos, C., Papageorgiou, D., Pierrakou, C., & Chtouris, S. (2007). Greek employers' attitudes to employing people with disabilities: Effects of the type of disability. *Scandinavian Journal of Disability Research*, *9*(1), 14–25. https://doi.org/10.1080/15017410600973234

Table 1

Hiring Managers' Ages and Generational Cohorts

Age Range	*n* (%)	Generational Cohort[a]
45 to 54	60 (26.3)	Generation X; Baby Boom Generation
55 to 64	107 (46.9)	Baby Boom Generation
65 to 74	56 (24.6)	Baby Boom Generation; Silent Generation
75 or older	5 (2.2)	Silent Generation; Greatest Generation

[a]Generational cohort as defined by Pew Research Center (Dimock, 2019).