Intersectionality in Implicit Associations: A Multi-Categorical Investigation into Weight and Age

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Abstract

Intersectionality in implicit bias has been overlooked in past psychological research, and the effect that overlapping social identities have on intergroup implicit associations is unclear. This study focuses on how interactions between different weight and age identities (old-thin, old-fat, young-thin, young-fat) impact implicit evaluations using a Multi-Category Implicit Association Test (MC-IAT). A self-report questionnaire was also presented to gauge participants' (N = 1177) explicit attitudes toward the target identities. Results found that both pro-thin and pro-young preferences were endorsed in implicit and explicit attitudes. Implicitly, pro-young biases were more strongly endorsed than pro-thin biases. In comparison, for explicit evaluations, older participants displayed ingroup age preferences that countered the pro-young preferences found in implicit evaluations. Findings from this study highlight how ingroup preferences and traditional findings in implicit cognition that studied social identities in isolation can be negated or even reversed when targets contain multiple social identities.

Keywords: MC-IAT, intersectionality, ingroup, implicit bias.

Introduction

The experiences individuals face are a result of the interplay between explicit (i.e., relatively more controlled) and implicit (i.e., relatively less controlled) attitudes possessed by those around them (De Houwer et al., 2009). However, the impact that more automatic implicit attitudes have on people's livelihoods has only recently been a focus of the social sciences. Defined as an evaluative disposition to act favorably or unfavorably towards a certain object or individual, an attitude can be both implicitly and explicitly expressed (Greenwald & Krieger, 2006). When these attitudes begin to sway an individual's neutrality towards different concepts consistently, a bias has formed. An explicit bias is defined as a disposition towards a group or attribute that is expressed aloud or publicly endorsed (Clarke, 2018), while an implicit bias is believed to be the positive or negative beliefs possessed outside people's cognitive control and reflective awareness (Holroyd et al., 2017).

As implicit biases are not necessarily consciously endorsed, they are assessed through indirect measures, such as the Implicit Association Test (IAT; Greenwald et al., 1998). The IAT is based on a series of categorization tasks that pairs certain stimuli with different attributes (e.g., positive words and a certain gender). Participants are then tested on their association with different categories (e.g., racial groups) with different attributes. During the sorting task, participants' speed and accuracy are assessed based on how quickly they sort certain attributes and category stimuli together. For instance, if in a weight-based IAT, participants are faster in blocks where images of thin people and positive words share a response key (as well as images of fat people and negative words share a response key) than in blocks with the reverse pairing, it is inferred that participants have an implicit preference for thin over fat people (Nosek et al.,

2002). IATs have frequently found more positive implicit attitudes toward culturally dominant group members (e.g., Christians, White people, straight people; Ratliff et al., 2020).

However, the interactions of different implicit biases can lead to varied attitudes when people embody multiple social identities. This overlap in social identities is explained by the term intersectionality (Purdie-Vaughns & Eibach, 2008). Within psychology, intersectionality explains how individuals have differing explicit and implicit attitudes depending on their perceptions of different social groups (Petsko et al., 2022). A working example can be seen when looking at the intersection between age and gender. As studies have shown that most victims of elder abuse are female (Penhale, 2003), this rise in discrimination may result from the overlap of ageism and sexism; it is the unique combination of individuals' age and gender identities that makes older women a particular target for abuse compared to younger women or older men.

This same notion applies when any combination of marginalized identities is intertwined. Unfortunately, studies on how implicit bias manifests when intersectional identities are considered have been mostly overlooked in psychological research (c.f., Connor et al., 2022). Intersectionality has been relatively unexplored for many reasons, one of which may be the conventional belief that simple, isolated trends in bias are sufficiently predictive of more complex identity interactions (Hester et al., 2020). However, this assumption has been challenged when examining larger and more complex (i.e., realistic) outcomes than the ones older studies have been based on. For instance, it has been well documented that Indigenous individuals and overweight individuals both face heightened discrimination and barriers when accessing medical services (Wylie & McConkey, 2019; Puhl & Brownell, 2001). Isolated trends

describing the implicit bias these two communities face would not sufficiently account for how an overlap in these identities would result in unique forms of discrimination.

This is especially true in situations where one social identity may be more salient than another concurring identity (e.g., socioeconomic class may not be as visible as one's race). Likewise, if multiple, distinct social identities are present simultaneously, unique patterns of associations could emerge. The lack of intersectionality in implicit attitude studies is then potentially problematic when considering issues of discrimination and how co-existing social identities can lead to vast differences in treatment (Hester et al., 2020).

The present work then examined whether trends in past research on implicit bias that only considered social identities in isolation get amplified, reduced, or stay the same when attitude targets have multiple social identities (in this case, when combining age and weight identities). Current IAT research indicates that for age and weight identities studied in isolation, strong implicit and explicit biases are present. Examining weight biases, Ratliff et al. (2020) demonstrated that participants self-reported strong pro-thin attitudes and an equally strong implicit preference for thin people over fat people. Pro-thin preferences were even maintained among overweight participants. Regarding age preferences, pro-young attitudes were also present across different ethnic, gendered, age, and religious groups (Nosek et al., 2007).

Findings from both these studies form the foundations of traditional trends in explicit and implicit attitudes towards weight and age identities. However, to test what happens to implicit attitudes when intersectionality is considered, a multi-category implicit association test (MC-IAT) was used. The MC-IAT is an expanded variant of the Brief IAT established by Sriram and Greenwald (2009). The main difference between the MC-IAT and IAT involves its measurement of associations between multiple groups at once as opposed to the traditional examination of

only two groups (e.g., Black people and White people). In particular, the MC-IAT is a categorization task where participants are asked to sort contrasting facial stimuli and valence words according to a set of grouping rules and have been used in past works to study implicit evaluations concerning social identities like age, race, and religion (Axt et al., 2014).

Investigating participants' implicit and explicit attitudes towards different combinations of weight and age identities, this study examined whether the intersection of two social identities at once differs from previously discussed trends in bias. Given what is presently known about age and weight biases, this study may show that despite its intersectionality, positive associations towards thin and/or young identities (both socially desirable) are still upheld. Findings may even suggest that certain identity intersections may be more negatively perceived than other target groups. The presence of ingroup favoritism (based on age) will also be tested to determine if any shielding from negative associations will occur.

Methods

Participants. Participants involved in the study came from the Project Implicit website. Participants were categorized into one of two age groups. Sample group 1 consisted of 818 participants that were 30 years old or younger ($M = 22.18$, $SD = 3.48$). Sample group 2 consisted of 359 participants that were 60 years old or older ($M = 65.27$, $SD = 4.61$). Based on the findings of a sensitivity power analysis run using G*Power, these sample sizes provided a minimum of 80% power to detect a within-subjects effect as small as $d = 0.19$, and a between-subjects effect as small as $d = 0.22$. Participants were excluded from analyses if more than 10% of their MC-IAT trials were faster than 300ms (4.42% of participants were excluded from analyses). Pre-registration of study materials, targeted sample sizes, and planned analyses can be found at https://osf.io/htep3/.

Stimuli. Twenty-four images were used as stimuli for the categorization task of this study. Pictures selected as stimuli were sourced from the Chicago Face Database (Ma et al., 2015) and the Park Aging Mind Laboratory (Minear & Park, 2004) face databases. Stimuli were selected along visible extremes in both weight and age spectrums and were sorted into one of four categories: young-fat, young-thin, old-fat, or old-thin. Within each group, stimuli were intentionally selected to be as racially and gender diverse as possible to eliminate any confounding variables. Additionally, images selected from the databases were front facing, neutral in expression, and devoid of any distinct features (e.g., facial tattoos). The twenty-four different stimuli used to represent the four pairwise groups in this study can be seen in Figure 1 below.

Procedures & Measures

This study consisted of a categorization task in the form of a Multi-Category Implicit Association Test (MC-IAT) and a self-report measure, both of which were given in randomized order. Upon completion of both tasks, participants were given their MC-IAT scores along with an explanation of what their scores indicated. In addition, a brief demographics survey was conducted during participants' registration for the research pool.

MC-IAT. A total of twelve trial blocks were used in the MC-IAT, each comparing two pairwise groups to each other. Each block contained sixteen trials that tested one target group against another by asking participants to adhere to certain sorting rules. In one trial, one target group was assigned to be associated with positive valence words (e.g. old-fat and good) while the other group was associated with negative valence words (e.g old-thin and bad). The same two groups were tested but with reversed group associations in a subsequent trial block (e.g. old-fat and bad vs old-thin and good). Within each trial block, the first four trials were considered

Figure 1. Each row displays the six different stimuli chosen and used for each of the four target identity groups.

practice to give respondents familiarity with each block's new set of association rules (Nosek et al., 2007). In each trial block, twelve different stimuli and ten words of negative or positive valence were used to evaluate associations between two different target groups. The order of response blocks was presented in a randomized manner. The evaluative categories used in the MC-IAT were *Good* and *Bad*. Sorting instructions were presented at the start of response blocks and asked participants to sort stimuli as rapidly as possible. Items were presented one at a time and corrections to sorting errors needed to be made to continue. Participants were asked to press either the 'E' or 'I' keys to appropriately sort stimuli to whichever side they were designated to.

MC-IAT scores were calculated using the *D* scoring algorithm (Axt et al., 2014); specifically, *D* scores were calculated by taking the difference in reaction time between the congruent trials (in which sorting rules were on par with social trends) and the reaction time to the incongruent pairings divided by the standard deviation of participant's reaction time across

all relevant trials. MC-IAT *D* scores (Axt et al., 2014) were calculated for each pairwise comparison (six in total). To analyze differences between the four different pairwise groups, implicit aggregate scores were calculated for each group by averaging the *D* score values each group (e.g., old-fat) was involved in (three per target group).

Self-Report Measures. For each of the six self-report questions comparing one target group to another, participants' explicit attitudes were measured on a 7-point Likert scale. Response options ranged from strong preferences for one group to strong preferences for the other group (e.g., strongly preferring old-fat people to young-fat people or strongly preferring young-fat people to old-fat people). Explicit aggregates for each of the four target groups were calculated by averaging the mean Likert scores each group (e.g., old-fat) was involved in (three per target group).

Data Analyses. Exclusions due to missing data account for the varying sample sizes across analyses. Primary data analyses examined differences in implicit aggregate and explicit aggregate scores the two age groups had towards the four target groups. Exploratory data analyses examined correlations between participants' implicit and explicit attitudes.

Results

Primary Analyses

Implicit Aggregate Comparisons. The first series of analyses compared the implicit aggregate scores each participant age group (i.e., younger versus older participants) had towards the four target groups. Among younger participants, five of the six t-tests proved to be statistically significant and of notable effect size (all t-values > 8.46, all p-values < 0.001, all d's > 0.34, average $d = 0.60$). From these analyses, young-thin identities received the most positive implicit associations followed by young-fat, old-thin then old-fat. The greatest differences

Table 1.

Implicit Attitudes, Young and Old Participants (Descriptive Statistics)

		Young Participants (Group 1)	
Target Groups	Mean	Standard Deviation	Number of Participants
Young-Thin	0.28	0.33	623
Young-Fat	0.02	0.30	622
Old-Thin	-0.06	0.31	623
Old-Fat	-0.23	0.29	624
		Old Participants (Group 2)	
Target Groups	Mean	Standard Deviation	Number of Participants
Young-Thin	0.29	0.32	293
Young-Fat	-0.03	0.27	295
Old-Thin	-0.04	0.29	293
Old-Fat	-0.21	0.29	294

Note: Means calculated are based on the implicit aggregate scores of young and old age group participants towards each of the four identity groupings. Positive mean values indicate more positive perceptions are fostered towards members of the tested group.

observed within the analyses were between the young-thin versus old-fat groups followed by the young-thin versus old-thin comparison. This implies that though pro-young and pro-thin biases are prevalent, age biases were stronger than weight biases. See Table 1 for descriptive statistics and see Table 2 for reports of each *t*-test.

Among older participants, five of the six *t*-tests conducted were statistically significant and notable in effect size (all *t*-values > 6.64, all *p*-values < 0.001, all *d*'s > 0.39, average $d = 0.62$). The ordinal rankings of identities were identical to those of young individuals. Young-thin identities were most positively associated followed by young-fat, old-thin then old-fat. More notably, old participants more strongly preferred young-thin identities and more strongly disliked the old-fat group than the younger respondents. Results from these comparisons indicate that a lack of ingroup favoritism is present among older participants. Implicit aggregate scoring

Table 2.

Implicit Attitudes, Young Participants (Inferential Statistics)

Values	Highest to Second Highest (young-thin vs young-fat)	Highest to Third Highest (young-thin vs old-thin)	Highest to Lowest (young-thin vs old-fat)
Significance	*	*	*
t	12.65	16.18	24.45
p	<0.001	<0.001	<0.001
d	0.51	0.65	0.98
Values	Second Highest to Third Highest (young-fat vs old-thin)	Second Highest to Lowest (young-fat vs old-fat)	Third Highest to Lowest (old-thin vs old-fat)
Significance		*	*
t	3.78	13.08	8.46
p	<0.001	<0.001	<0.001
d	0.15	0.53	0.34

Note: Student's t-test used. Values tested above pertain to the implicit aggregate scores derived from the MC-IAT D scores observed during the MC-IAT. Under the values column, *t* = t-value from dependent samples t-test, *p* = p-value, and *d* = Cohen's *d* effect size. An asterisk in the significance row denotes that the comparison below is significant statistically and in effect size.

results from both old and young participants are presented in Figure 2. See Table 1 for descriptive statistics and see Table 3 for reports of each t-test.

Explicit Aggregate Comparisons. The second series of test analyses investigated differences in explicit attitudes for both younger and older participants separately. Among younger participants, five of the six t-tests conducted were statistically significant and of notable effect size (all *t*-values > 8.50, all *p*-values < 0.001, all *d*'s > 0.33, average *d* = 0.53). From these analyses, young-thin identities were most positively evaluated followed by old-thin, young-fat then old-fat. This closely follows the young participants' implicit attitudes with the only rank change seen between the young-fat and old-thin groups. Findings from these comparisons indicate that explicitly, pro-thin attitudes were stronger than pro-young attitudes. See Table 4 for descriptive statistics and see Table 5 for reports of each t-test.

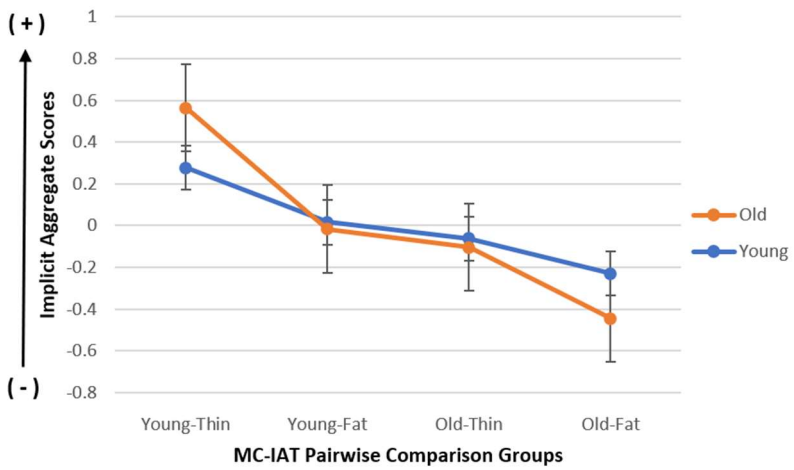

Figure 2. Averages of implicit aggregate scores for each of the four target groups participant age group. Error bars mark 95% confidence intervals for each mean.

Among older group participants, three of the six paired sample t-tests were statistically significant and of notable effect size (all t-values > 7.84, all p-values < 0.001, all d's > 0.47, average d = 0.54). Analyses showed that older participants most positively perceived the young-thin pairing followed by the old-thin, old-fat then young-fat. Comparisons also indicated that the strongest mean differences were seen in the young-thin versus young-fat and old-thin versus young-fat comparisons. These findings indicate that there may be ingroup favoritism present as older participants endorsed pro-old attitudes more than younger participants did. Like younger participants, pro-thin attitudes appeared stronger than pro-young beliefs. Explicit aggregate scoring results from both older and younger participants are presented in Figure 3. See Table 4 for descriptive statistics and see Table 6 for reports of each t-test.

Table 3.

Implicit Attitudes, Old Participants (Inferential Statistics)

Values	Highest to Second Highest (young-thin vs young-fat)	Highest to Third Highest (young-thin vs old-thin)	Highest to Lowest (young-thin vs old-fat)
Significance	*	*	*
t	11.86	11.34	15.99
p	<0.001	<0.001	<0.001
d	0.69	0.66	0.94
Values	Second Highest to Third Highest (young-fat vs old-thin)	Second Highest to Lowest (young-fat vs old-fat)	Third Highest to Lowest (old-thin vs old-fat)
Significance		*	*
t	0.43	7.33	6.64
p	0.66	<0.001	<0.001
d	0.03	0.43	0.39

Note: Student's t-test used. Values tested above pertain to the implicit aggregate scores derived from the MC-IAT D scores observed during the MC-IAT. Under the values column, *t* = t-value from dependent samples t-test, *p* = p-value, and *d* = Cohen's *d* effect size. An asterisk in the significance row denotes that the comparison below is significant statistically and in effect size.

Table 4.

Explicit Attitudes, Young and Old Participants (Descriptive Statistics)

		Young Participants (Group 1)	
Target Groups	Mean	Standard Deviation	Number of Participants
Young-Thin	4.60	0.89	733
Young-Fat	3.81	0.82	734
Old-Thin	3.97	0.62	733
Old-Fat	3.64	0.77	731
		Old Participants (Group 2)	
Target Groups	Mean	Standard Deviation	Number of Participants
Young-Thin	4.36	0.69	301
Young-Fat	3.64	0.64	305
Old-Thin	4.24	0.52	301
Old-Fat	3.79	0.66	309

Note: Mean column refers to the mean aggregate explicit scores across the participants whose data has been included in the data analyses.

Table 5.

Explicit Attitudes, Young Participants (Inferential Statistics)

Values	Highest to Second Highest (Young-Thin vs Old-Thin)	Highest to Third Highest (Young-Thin vs Young-Fat)	Highest to Lowest (Young-Thin vs Old-Fat)
Significance	*	*	*
t	14.79	14.46	16.75
p	<0.001	<0.001	<0.001
d	0.58	0.56	0.65
Values	Second Highest to Third Highest (Old-Thin vs Old-Fat)	Second Highest to Lowest (Old-Thin vs Young-Fat)	Third Highest to Lowest (Old-Fat vs Young-Fat)
Significance	*	*	
t	7.84	9.61	2.76
p	<0.001	<0.001	0.01
d	0.47	0.58	0.16

Note: Student's t-test used. Values tested above pertain to the average explicit aggregate scores obtained across self-report questionnaires. Under the values column, *t* = t-value from dependent samples t-test, *p* = p-value, and *d* = Cohen's *d* effect size. An asterisk in the significance row denotes that the comparison below is significant statistically and in effect size.

Table 6.

Explicit Attitudes, Old Participants (Inferential Statistics)

Values	Highest to Second Highest (Young-Thin vs Old-Thin)	Highest to Third Highest (Young-Thin vs Old-Fat)	Highest to Lowest (Young-Thin vs Young-Fat)
Significance		*	*
t	2.67	7.98	10.55
p	0.01	<0.001	<0.001
d	0.16	0.48	0.63
Values	Second Highest to Third Highest (Old-Thin vs Young-Fat)	Second Highest to Lowest (Old-Thin vs Old-Fat)	Third Highest to Lowest (Young-Fat vs Old-Fat)
Significance		*	
t	3.32	8.50	3.77
p	<0.001	<0.001	<0.001
d	0.13	0.33	0.15

Note: Student's t-test used. Values tested above pertain to the average explicit aggregate scores obtained across self-report questionnaires. Under the values column, *t* = t-value from dependent samples t-test, *p* = p-value, and *d* = Cohen's *d* effect size. An asterisk in the significance row denotes that the comparison below is significant statistically and in effect size.

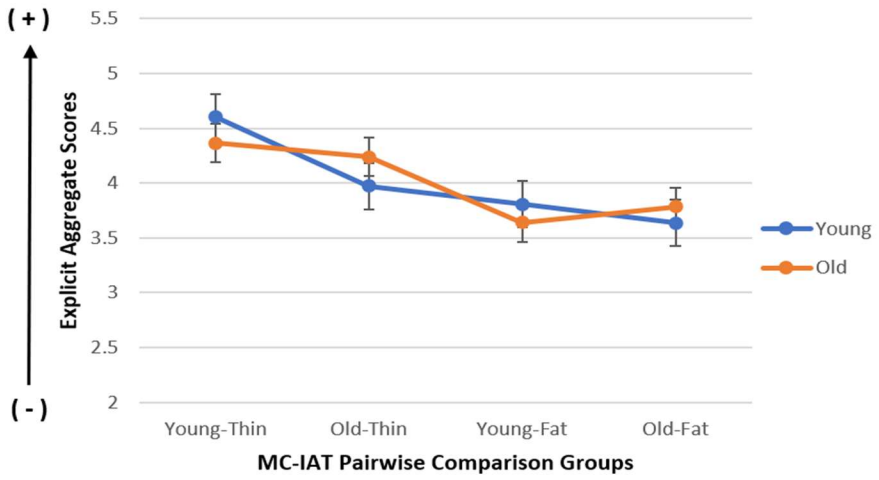

Figure 3. Averages of explicit aggregate scores for each of the four target groups participant age group. Error bars mark 95% confidence intervals for each mean.

Exploratory Analyses

Implicit-Explicit Correlations. The third series of tests examined whether correlations existed between the implicit and explicit aggregate scores towards each target group, here using all participants. Of the four tests conducted, only two proved to be statistically significant (young-fat, and young-thin). See Table 7 for correlation values.

Table 7.

Implicit-Explicit Correlations Across Age Groups

Values	Old-Fat	Young-Fat	Old-Thin	Young-Thin
r	0.03	0.10	0.03	0.09
p	0.34	0.01	0.44	0.01
Number of Participants	833	835	829	828

Note: The data analyzed to produce these statistics examined across both age groups any correlations between implicit and explicit aggregate scores for each of the four groups. Under the values column, *r* = Pearson's correlation coefficient and *p* = p-value.

General Discussion

A few key trends in bias arose when comparing the implicit and explicit attitudes of younger and older participants towards different combinations of age and weight identities. Within implicit attitudes, both age groups similarly ranked implicit preferences as young-thin > young-fat > old-thin > old-fat. Among older participants, reliable differences between the pairwise groups were found ($p < 0.05$) except for the young-fat versus old-thin comparison ($p = 0.66$). Among young participants, reliable differences were found between each pairwise comparison ($p < 0.05$) however, the difference between the young-fat and old-thin comparison was essentially negligible in effect size ($d = 0.03$).

On par with traditional trends in bias, both participant groups displayed pro-young and pro-thin preferences; however, results from these comparisons demonstrate that age biases were more significant than weight biases in implicit attitudes, suggesting unique insights that may emerge from taking a more intersectional approach to implicit intergroup attitudes. Within explicit measures, both younger and older participants reported their strongest preference for the young-thin targets followed by the old-thin target groups. The sample groups varied in their explicit rankings of young-fat and old-fat, where younger participants more strongly preferred the young-fat group and older participants preferred the old-fat group. Older participants explicitly preferring the old-fat pairing more than the young-fat grouping acted as one indicator of ingroup favoritism in explicit attitudes that did not exist in implicit attitudes.

Finally, the largely weak implicit-explicit correlations suggest an interesting divergence between people's implicit and explicit evaluations of target group members. These small correlations are largely inconsistent with the general intergroup attitudes literature (Nosek, 2005) where implicit-explicit correlations are typically small-to-moderate in size. In Nosek et al.

(2007) for instance, implicit and explicit attitudes towards aging were around 0.13 while for weight attitudes, $r = 0.20$. Future research on this topic will want to more closely investigate possible reasons for this discrepancy; for instance, participants may have less elaborate explicit attitudes towards groups that combine age and weight identities (Nosek, 2007). Alternatively, implicit and explicit attitudes may not have been well correlated due to issues involving how participants self-identified. In studies such as of Marini et al. (2013), discrepancies between participants' explicit and implicit attitudes, along with a lack of ingroup shielding, were due to participants not self-identifying with the socially undesirable group (i.e., fat). In this study, participants may not explicitly identify as being overweight or "old", which may weaken associations between implicit and explicit attitudes, particularly when involving two identities (age and weight) where people may not strongly self-identify with the stigmatized group.

Intersectionality Versus Identities in Isolation. In many prior studies using the IAT (e.g., Ratliff et al., 2020), preferences for thin people over fat people have been found in explicit attitudes and even more strongly in implicit attitudes. In terms of age biases, only moderate preferences for young identities were found explicitly but implicitly, pro-young biases were strongly present on the IAT (Ratliff et al., 2020). In this and other work, the magnitude of implicit age-based biases was consistently stronger than weight-based biases (Ratliff et al., 2020; Nosek et al., 2007). Given this baseline, findings from this study indicate that the presence of intersectionality does uphold weight bias trends while amplifying pro-young preferences within implicit attitudes. Regarding explicit attitudes, this study maintains the same findings as in the earlier studies mentioned, as pro-thin preferences were strongly endorsed, and pro-young preferences only moderately endorsed. Finally, older participants were found to exhibit some

ingroup favoritism (i.e., greater overall favoritism for older groups, regardless of weight) but only in terms of explicit attitudes.

Ingroup Favouritism. Though ingroup favoritism is pervasive across most studies on implicit bias, it does have its boundaries. Many of the findings in this study followed prior studies that only looked at age or weight biases in isolation. For instance, Nosek et al.'s (2007), results demonstrated participants from all age groups showed similar levels of bias related to age and weight. This pattern, however, was contradicted by explicit attitudes, as age preferences demonstrated a significant reduction in pro-young bias across the lifespan (Nosek et al., 2007). Within this study, explicit findings seemed to contradict the patterns laid out by Nosek et al. (2007). Explicitly, ingroup favoritism among old age participants was substantial. However, when coupled with the less desirable fat identity (i.e., old-fat), ingroup age favoritism among older participants disappeared. This finding is noteworthy, as it suggests that in explicit evaluations, the intersection of the two less desirable identities (older age and overweight) strongly diminishes ingroup favoritism based on age. Explicit, age-based ingroup preference appeared to be stronger among younger than older participants. The reasons why an age-based, implicit ingroup effect is present among young participants but not old is unclear. It is possible that the absence of consistent levels of ingroup favoritism among older participants may have been due to older participants only loosely self-identifying as old (Westerhof et al., 2003).

Limitations. In conducting this study, several limitations were present and are worth considering. One of the main limitations involves the sampling and data collection process not being representative of North Americans. To recruit participants, individuals had to have awareness of Project Implicit's website, and this may have created some selection effects. These effects may manifest in the form of sampling biases due to convenience sampling. The remote

nature of the study and sampling done only through Project Implicit may have resulted in certain subsets of the population (i.e., non-tech users) being excluded. Due to the study being conducted remotely, this also implies that participants needed to be more tech-savvy to complete the study. Despite the increases in internet literacy among adults above 60 years old, many studies find that technology usage is still a minority activity amongst the elderly (Schreurs et al., 2017; Selwyn et al., 2004). The diversity of opinions and cultures represented online may then expose tech-savvy, older age individuals to novel perspectives they may otherwise not encounter. Overrepresentations of tech-exposed older individuals within remote studies could minimize the study's generalizability as baseline attitudes of tech-illiterate older adults are unclear. Thus, limitations on the kinds of old age participants that were sampled may mean their attitudes were not reflective of the mindsets of other older age North Americans. In future work, this limitation could be minimized by including sampling practices that are not exclusively online (e.g., participant recruitment from nursing homes) and by offering opportunities for study participation in physical lab settings.

It is also useful to keep in mind that due to the binary assignments of participants to older or younger age groups, respondents between the ages of thirty-one and fifty-nine were not included in this study. This may mean generational differences between the older and younger age groups were more substantial and may have provided insights into more significant differences in their attitudes. By including participants from the millennial generation, clearer trends on how age-based, explicit ingroup preferences manifest over the lifespan could have been observed. Though explicit, age-based ingroup favoritism was observed across the life span as reported by Nosek et al. (2007), this favoritism disappeared in older participants' attitudes towards the old identity coupled with the less desirable fat identity (i.e., old-fat). If intermediary age groups were also

investigated with the current study, more clarity on why these contradictions occurred and how the explicit preference gradient presents may have been provided (e.g., generational influences).

Future Directions. Results of the current work suggest several productive avenues for future studies on this topic. One way in which this study could be extended would involve examining how certain demographic features (e.g., political orientation) may influence attitudes people have towards different identities, both in isolation or in combination with other social identities. For instance, in Nosek et al.'s study (2007), participant characteristics like gender or race were believed to be influencing individual IAT outcomes. Specifically, men reportedly had stronger pro-thin preferences than women while Black people stigmatized overweight individuals less than White people did (Nosek et al., 2007). Findings of this nature suggest that both cultural beliefs and subgroup attitudes are worthy of further investigation into their influence on implicit and explicit preferences. Another worthwhile extension of this study would involve examining whether an ingroup preference is present among participants of different weights. Using body silhouettes instead of traditional facial stimuli as well as asking participants to self-report which weight class they belong to (i.e., comparatively thin or overweight) would provide novel insights into how weight attitudes manifest.

Conclusion

Findings from this study suggest that traditional trends in weight and age bias are present and amplified when intersectionality is present. Across implicit attitudes, pro-young biases appear stronger than pro-thin biases. Ingroup favoritism among old age participants is also minimized when examining implicit attitudes. Across explicit attitudes, pro-thin biases appeared stronger than pro-young biases as seen in the ingroup favoritism old-age participants displayed. This is to say that though traditional trends in weight and age attitudes are sufficiently upheld,

they do not account for the differing strengths of pro-young and pro-thin patterns in implicit and explicit attitudes. Next steps for intersectionality research will involve extending the scope of research to other social identity combinations and examining how including targets with more than just two identity combinations influence other traditional trends in bias.

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Authors' Contributions

Project was supervised by JA and carried out within the McGill Intergroup Cognition Lab. Design and topic of study conceived by JA. Background papers sourced by JA and MS. Methodological approach proposed by JA and carried out by both JA and MS. Stimuli sourced by MS. Data collection and sorting performed by JA over the Project Implicit website. MS carried out data analyses and interpretations. All visual aids, tables, and graphs were designed by MS. Manuscript was written by MS with critical feedback from JA.