Decreasing Internalized Ageism: Development, Feasibility, and Effectiveness of a Process-Based Intervention

by

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Abstract

A lifetime of exposure to ageism may be internalized in older adults, and these ageist beliefs that are directed inwards can have severe consequences. Unfortunately, research on reducing internalized ageism is scarce. To address this, I designed and implemented a six-week process-based intervention to reduce internalized ageism. This intervention utilized education, acceptance and commitment therapy, and attributional retraining. I evaluated the feasibility and effectiveness of this intervention in reducing internalized ageism, and the mechanisms through which it achieved this reduction. A total of 81 participants consented to the feasibility portion of the study, and 78 consented to the effectiveness portion of the study. Regarding feasibility, the program was evaluated overwhelmingly positively. Most participants rated each session and the overall program as very useful and indicated that it changed their perspectives on ageism. The program also maintained impressive engagement, with only three participants dropping out of the program, and the majority completing the between-session activities. Participants also attributed a wide range of novel behaviours to this intervention. Regarding effectiveness, participants' internalized ageism was substantially reduced following the intervention and this was maintained at a two-month follow up; improvements were associated with large effect sizes. Additionally, this reduction of internalized ageism was mediated by increases in psychological flexibility, mindfulness, and perceived control. Altogether, this study provides a promising foundation from which to advance research on interventions that address the problem of internalized ageism – a problem that has severe consequences on the health and well-being of growing numbers of older adults in every country around the world.

Keywords: Internalized ageism, Process-based therapy, Acceptance and commitment therapy, Attributional retraining, Older adults

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General Introduction: Ageism - A Pervasive and Growing Problem

Ageism refers to the biased ways we think, feel and act towards someone based on their age. It is the stereotypes, prejudice, and discrimination we levy at someone, typically older adults, because of the age cohort they belong to (World Health Organization [WHO], 2023). Butler (1969) first coined the term 'ageism' when he elucidated the negative stereotypes being applied to older people that lead to measurable forms of discrimination, segregation, and disregard. This harm brought forth by ageism is so notable, the WHO (2015) identified its reduction as an important facet in improving the health of humans around the world. Furthermore, since it was first identified, its pervasiveness has consistently increased. Computational linguistic analysis of a historic database containing over 400 million words, spanning the years 1810 to 2009, revealed that over the course of these 200 years, age stereotypes have become increasingly negative (Ng et al., 2015). These increasingly negative views are particularly problematic when considered alongside population demographics.

As age stereotypes have become more negative, the number of individuals potentially subject to these stereotypes has increased as well. The world's population is quickly aging (United Nations, 2022a). Over the past century, the average human lifespan has increased by more than the previous 50 centuries combined (Butler, 2008). This sudden and steep rise in life expectancy has appeared consistent and linear, with an approximate rise of 2.5 years in life expectancy for each of the past decades (Oeppen & Vaupel, 2002; Vaupel et al., 2021). This increase in life expectancy, combined with the decreasing birthrate across the globe (United Nations, 2022b), meant that in 2018, for the first time in recorded history, the number of people throughout the world 65 years of age and older surpassed the number of children aged under 5-years-old (Ritche, 2019). In fact, the number of people 65-years-of-age and older is predicted to eclipse the number of people under the age of 15 over the course of the coming 50 years (United Nations, 2022a). Thus, older adults are, and will continue to be, one of our largest age demographics. Ergo, if nothing is done to combat the effects of ageism, more individuals will suffer its

consequences. Today, approximately 96% of older Americans (i.e., those age 65 years and older) report that they encounter ageism regularly (Allen et al., 2020). This ageism is encountered from a variety of sources.

Ageist beliefs can be found in individuals across the globe, and across age groups. Though ageist beliefs tend to be more negative in more individualistic, Western cultures, ageist beliefs are still found in Eastern cultures that more explicitly venerate their older citizens (Ackerman & Chopik, 2021; Chang et al., 2020). Similarly, ageist beliefs exist across age demographics. From as young as three, children may begin to display negative stereotypes toward older adults (See & Nicoladis, 2010). These negative stereotypes are also seen in pre-schoolers (Blunk & Williams, 1997; Kocarnik & Ponzetti, 1986; Seefeldt, 1987), elementary school children (Weinberger, 1979), middle school children (Lichtenstein et al., 2001), adolescents (Doka, 1985), and young adults (Barrett & Cantwell, 2007; Barrett & von Rohr, 2008). Despite what our intuitions might tell us, ageism is not a form of prejudice reserved for the young. Research has demonstrated that middle-aged and older adults may display more ageist behaviour than adolescents and young adults (Cherry et al., 2016). Thus, the problem of ageism is widespread, spanning national borders and age demographics alike. Beyond residing in the minds of individuals, these ageist sentiments may also be woven into the fabric of our cultures.

Cultural or institutional ageism may be particularly insidious, existing in the shadows of many of our institutions. Ageist practices appear normal and avoid recognition due to these ageist rules, norms, and practices being so long-standing and ritualized (WHO, 2021). A recent example of such practices surfaced when CTV News fired Lisa Laflamme, despite her recently winning the “best national news anchor award” at the Canadian Screen Awards, an award she had previously won five times (Paling, 2022). This firing led to the head of CTV news taking leave amidst allegations of sexism and ageism, as there was strong suspicion that this firing resulted from her decision to let her hair grey (Horton, 2022).

Accepted as the norm, these ageist undertones in society may operate unchallenged in the background of institutions and serve to perpetuate ageist beliefs, prejudice, and discrimination.

Institutional ageism, although insidious, can be identified in the workplace, in anti-aging industries, and in media. In the workforce, older adults are significantly less likely to be hired, receive training opportunities, or receive promotions than their younger counterparts (Chang et al., 2020), even though they are more dependable, have less turnover and absenteeism, and fewer accidents (Butler, 2008). Multi-billion-dollar anti-aging industries are built on the ageist message that consumers should spend large sums of money to avoid the physical signs of aging (Calasanti et al., 2012; Riddler, 2020). In media, film and television often contains ageist commentary (Smith et al., 2018), older adult roles are underrepresented across the globe and when these roles are included, they are often unfavourable (Bai, 2014). Ageism also flows through social media (Gu & Dupre, 2021; Levy et al., 2014; Oscar et al., 2017; Rosales & Fernández-Ardèvol, 2020) which is often developed with a marked disregard for older adults (Rosales & Fernández-Ardèvol, 2020) and includes and amplifies ageist messaging (Xiang, 2020). The COVID-19 pandemic illuminated this amplification and escalation of ageist rhetoric on social media with explicitly ageist content trending worldwide (Graham, 2022; Jimenez-Sotomayor et al., 2020; Meisner, 2020; Skipper & Rose, 2021; Soto-Perez-de-Celis, 2020). The COVID-19 pandemic highlighted ageism in other cultural institutions as well.

Beyond industry and media, institutional ageism also exists in our political and healthcare systems. Governments did relatively little to prepare long-term care homes for the forewarned impact COVID-19 would have on them, and a shameful number of our most vulnerable paid the price (Stratton et al., 2021). Some politicians even went as far as suggesting older adults should consider risking their own lives for the sake of an open economy (Pittis, 2020). Beyond COVID-19, the medical industry focuses on expensive procedures, devices, and drugs, as opposed health prevention strategies which preserve and protect the wellbeing of our most vulnerable populations, including older adults (Estes et

al., 2012). This often leads doctors to ignore otherwise treatable conditions as part and parcel of the aging process, which may manifest in older adults avoiding or giving up on seeking treatment (Makris et al., 2015). Furthermore, medical students receive little training in geriatrics, and geriatric doctors get paid significantly less than their peers (Meiboom et al., 2015). To put a number on the effects of ageism in health care, researchers have estimated it to cost approximately $63 billion per year in the US alone (Levy et al., 2020). With such ageist sentiments cemented into so many foundational aspects of society, it is no wonder ageist beliefs are so pervasive and so commonly internalized.

Internalized Ageism and its Consequences

Internalized ageism refers to the process in which across a lifetime of exposure to ageist messaging, an individual internalizes these messages, and begins to believe them (Levy, 2009). Once internalized, these ageist sentiments can operate unconsciously, biasing how we see our aging selves, and other older adults. As we age into older adulthood ourselves, these ageist views begin to get directed at not only members of our own age cohort, but ourselves. Indeed, as we age, these stereotypes of older adults become increasingly self-relevant and thus increasingly consequential. The consequences of internalized ageism are multifaceted and deleterious. The way in which they negatively impact our lives and health occur along psychological, behavioural, and physiological pathways.

Many severe consequences of ageist beliefs emerge as a by-product of internalized ageism. Perhaps most shockingly, internalized ageism is consistently demonstrated to negatively impact longevity in both Western and Eastern countries (Gu et al., 2017; Kotter-Grühn et al., 2009; Levy, Slade, Kunkel, et al., 2002; Levy & Bavishi, 2018; B. R. Levy & Myers, 2005; Maier & Smith, 1999; Rakowski & Hickey, 1992; Sargent-Cox et al., 2014; Stewart et al., 2012; Zhao et al., 2017). This impact is not trivial, with some research pointing to a 7.5-year longevity advantage for those holding positive self-perceptions of aging (Levy et al., 2002). Internalized ageism is also associated with worse quality of life (Top et al., 2012), dissatisfaction in social relationships (Cheng, 2017), and increasing risky behaviours

such as drinking and smoking (Villiers-Tuthill et al., 2016). Regarding mental health, negative self-perception of aging are associated with the onset and lifetime prevalence of depression, and with the severity of depressive symptoms over time (Bai et al., 2016; Barker et al., 2007; Chun et al., 2015; Freeman et al., 2016; Gum & Ayalon, 2018; Han, 2018; Han & Richardson, 2015; Kim, 2015; Kim et al., 2016; Kwak et al., 2014; Lu et al., 2009; O'Shea et al., 2017; Wight et al., 2015; Wurm & Benyamini, 2014). Regarding cognitive outcomes, in longitudinal designs, directed ageist stereotypes predict worse cognitive performance (Gu et al., 2016; Levy et al., 2012; Robertson et al., 2016; Seidler & Wolff, 2017; Sutin et al., 2015). In experimental lab designs, the manipulation of self-perceptions of aging is also able to affect cognitive performance, such that negative self-perceptions lead to worse performance (Lee & Lee, 2019; Levy, 1996). Regarding individual health, negative self-perceptions of aging are associated with less ability to successfully recover from severe disability (Levy et al., 2012), and are associated with more functional decline (Levy, Slade, Kunkel, et al., 2002; Sargent-Cox et al., 2012a; Tovel et al., 2019). Internalized ageism also serves as a barrier to technology use (Köttl et al., 2021) and leads individuals to want to retire early (van der Horst, 2019). In short, internalized ageism negatively impacts older adults across health, cognitive, occupational, and social domains. Thus, reducing the prevalence of internalized ageism and its negative impacts is a laudable goal with many potential benefits to both the individual and society at large.

In summary, ageism is a pervasive problem and its potential for negative influence grows alongside the increasing population of older adults who are affected by it. These ageist sentiments and beliefs come from individuals, but perhaps more insidiously, also exist as an undertone of many of our cultural institutions. Over time, these ageist messages can be internalized within aging individuals who will find themselves the subject of their own ageist beliefs. These negative self-perceptions of aging carry harmful consequences on those individuals. Unfortunately, little research exists that addresses this problem of internalized ageism. To my knowledge, there are no published reports of longitudinal,

theory-informed interventions to decrease internalized ageism. As such, this research sought to address this gap in the literature and to build a foundation from which to target a solution for internalized ageism and its negative consequences.

The Present Research

The current study sought to address the problem of internalized ageism and its negative impact on the health of older adults by creating and evaluating an intervention aimed at the reduction of internalized ageism. This Zoom-based intervention spanned six sessions over six weeks and was developed from the perspective of process-based therapy (Hofmann & Hayes, 2019). In other words, it targeted core mediating variables that theoretical considerations and empirical evidence suggested would work as mechanisms to reduce internalized ageism. This intervention was grounded in stereotype embodiment theory (Levy, 2009) which posits that internalized ageism influences health outcomes along psychological, behavioural, and physiological pathways. Mechanisms shown to mediate these pathways and internalized ageism itself were the targets of this intervention. I employed empirically supported interventions for acting on these mechanisms and/or on internalized ageism itself. This included education, acceptance and commitment therapy, and attributional retraining.

The remainder of this thesis is separated into two separate studies that follow, presented in manuscript form. The first study focuses on program creation and feasibility (Murphy, 2023a). The study outlines a detailed account of the theoretical and empirical justifications for the program creation logic and session-by-session intervention procedure. Program development is reported in alignment with relevant guidelines (Hoffmann et al., 2014). Furthermore, this study sought to address the feasibility of the intervention by answering three separate questions. These questions were: (1) Did the participants remain engaged throughout the intervention? (2) How useful did the participants find each of the six sessions, and the program as a whole? And (3) did the participants feel the intervention led to meaningful change, regarding their opinions on ageism and/or internalized ageism, and regarding

meaningful behaviour change? The second study sought to address the effectiveness of the intervention in reducing quantitative measures of internalized ageism immediately following the intervention, and at a two-month follow up (Murphy, 2023b). Additionally, mediation analysis determined whether any reduction in internalized ageism was a function of change in process-based variables targeted by the specific intervention tools. The research to follow received ethics approval and all participants provided consent.

References

Ackerman, L. S., & Chopik, W. J. (2021). Cross-cultural comparisons in implicit and explicit age bias. *Personality and Social Psychology Bulletin*, *47*(6), 953–968. https://doi.org/10.1177/0146167220950070

Allen, J. O., Solway, E., Kirch, M., Singer, D., Kullgren, J., & Malani, P. (2020). Everyday ageism and health: Evidence from the national poll on healthy aging. *Innovation in Aging*, *4*(Suppl 1), 723. https://doi.org/10.1093/GERONI/IGAA057.2558

Bai, X. (2014). Images of ageing in society: A literature review. *Journal of Population Ageing*, *7*(3), 231–253. https://doi.org/10.1007/S12062-014-9103-X

Bai, X., Lai, D. W. L., & Guo, A. (2016). Ageism and depression: Perceptions of older people as a burden in China. *Journal of Social Issues*, *72*(1), 26–46. https://doi.org/10.1111/JOSI.12154

Barker, M., O'Hanlon, A., McGee, H. M., Hickey, A., & Conroy, R. M. (2007). Cross-sectional validation of the Aging Perceptions Questionnaire: A multidimensional instrument for assessing self-perceptions of aging. *BMC Geriatrics*, *7*. https://doi.org/10.1186/1471-2318-7-9

Barrett, A. E., & Cantwell, L. E. (2007). Drawing on stereotypes: Using undergraduates' sketches of elders as a teaching tool. *Educational Gerontology*, *33*(4), 327–348. https://doi.org/10.1080/03601270701198950

Barrett, A. E., & von Rohr, C. (2008). Gendered perceptions of aging: An examination of college students. *International Journal of Aging & Human Development*, *67*(4), 359–386. https://doi.org/10.2190/AG.67.4.D

Blunk, E. M., & Williams, S. W. (1997). The effects of curriculum on preschool children's perceptions of the elderly. *Educational Gerontology*, *23*(3), 233–341. https://doi.org/10.1080/0360127970230303

Butler, R. N. (2008). *The longevity revolution : the benefits and challenges of living a long life* (1st ed.). PublicAffairs.

Calasanti, T., Sorensen, A., & King, N. (2012). Anti-ageing advertisements and perceptions of ageing. In V. Ylänne (Ed.), *Representing ageing*. Palgrave Macmillan.

Chang, E. S., Kannoth, S., Levy, S., Wang, S. Y., Lee, J. E., & Levy, B. R. (2020). Global reach of ageism on older persons' health: A systematic review. *PLOS ONE*, *15*(1), e0220857. https://doi.org/10.1371/JOURNAL.PONE.0220857

Cheng, S. T. (2017). Self-perception of aging and satisfaction with children's support. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *72*(5), 782–791. https://doi.org/10.1093/GERONB/GBV113

Cherry, K. E., Brigman, S., Lyon, B. A., Blanchard, B., Walker, E. J., & Smitherman, E. A. (2016). Self-reported ageism across the lifespan: Role of aging knowledge. *International Journal of Aging and Human Development*, *83*(4), 366–380. https://doi.org/10.1177/0091415016657562

Chun, H., Kang, M., Cho, S. il, Jung-Choi, K., Jang, S. N., & Khang, Y. H. (2015). Does the experience of discrimination affect health? A cross-sectional study of Korean elders. *Asia-Pacific Journal of Public Health*, *27*(2), NP2285–NP2295. https://doi.org/10.1177/1010539513506602

Doka, K. J. (1985). Adolescent attitudes and beliefs toward aging and the elderly. *International Journal of Aging and Human Development*, *22*(3), 173–187. https://doi.org/10.2190/MKYY-7VGG-J1EL-MKQ4

Estes, C. L., Harrington, C., & Pellow, D. N. (2012). The medical-industrial complex and the aging enterprise. *Social Policy Ampnumx0026; Aging: A Critical Perspective Social Policy Ampnumx0026; Aging: A Critical Perspective*, 165–186. https://doi.org/10.4135/9781452232676.N8

Freeman, A. T., Santini, Z. I., Tyrovolas, S., Rummel-Kluge, C., Haro, J. M., & Koyanagi, A. (2016). Negative perceptions of ageing predict the onset and persistence of depression and anxiety: Findings from a prospective analysis of the Irish Longitudinal Study on Ageing (TILDA). *Journal of Affective Disorders*, *199*, 132–138. https://doi.org/10.1016/J.JAD.2016.03.042

Graham, M. E. (2022). "Remember this picture when you take more than you need": Constructing morality through instrumental ageism in COVID-19 memes on social media. *Journal of Aging Studies*, *61*. https://doi.org/10.1016/j.jaging.2022.101024

Gu, D., Brown, B. L., & Qiu, L. (2016). Self-perceived uselessness is associated with lower likelihood of successful aging among older adults in China. *BMC Geriatrics*, *16*(1), 1–12. https://doi.org/10.1186/S12877-016-0348-5

Gu, D., & Dupre, M. E. (Eds.). (2021). Ageism in social media. In *Encyclopedia of Gerontology and Population Aging* (pp. 186–186). Springer International Publishing. https://doi.org/10.1007/978-3-030-22009-9_300099

Gu, D., Dupre, M. E., & Qiu, L. (2017). Self-perception of uselessness and mortality among older adults in China. *Archives of Gerontology and Geriatrics*, *68*, 186–194. https://doi.org/10.1016/J.ARCHGER.2016.10.015

Gum, A. M., & Ayalon, L. (2018). Self-perceptions of aging mediate the longitudinal relationship of hopelessness and depressive symptoms. *International Journal of Geriatric Psychiatry*, *33*(4), 591–597. https://doi.org/10.1002/GPS.4826

Han, J. (2018). Chronic illnesses and depressive symptoms among older people: Functional limitations as a mediator and self-perceptions of aging as a moderator. *Journal of Aging and Health*, *30*(8), 1188–1204. https://doi.org/10.1177/0898264317711609

Han, J., & Richardson, V. E. (2015). The relationships among perceived discrimination, self-perceptions of aging, and depressive symptoms: A longitudinal examination of age discrimination. *Aging & Mental Health*, *19*(8), 747–755. https://doi.org/10.1080/13607863.2014.962007

Hoffmann, T. C., Glasziou, P. P., Boutron, I., Milne, R., Perera, R., Moher, D., Altman, D. G., Barbour, V., Macdonald, H., Johnston, M., Kadoorie, S. E. L., Dixon-Woods, M., McCulloch, P., Wyatt, J. C., Phelan, A. W. C., & Michie, S. (2014). Better reporting of interventions: Template for intervention description and replication (TIDieR) checklist and guide. *BMJ*, *348*. https://doi.org/10.1136/BMJ.G1687

Hofmann, S. G., & Hayes, S. C. (2019). the future of intervention science: Process-based therapy. *Clinical Psychological Science*, *7*(1), 37–50. https://doi.org/10.1177/2167702618772296

Horton, J. (2022, September 2). *The firestorm over the firing of a gray-haired news anchor in Canada*. Los Angeles Times. https://www.latimes.com/opinion/story/2022-09-02/lisa-laflamme-gray-hair-women-workplace

Jimenez-Sotomayor, M. R., Gomez-Moreno, C., & Soto-Perez-de-Celis, E. (2020). Coronavirus, ageism, and Twitter: An evaluation of tweets about older adults and COVID-19. *Journal of the American Geriatrics Society*, *68*(8), 1661–1665. https://doi.org/10.1111/JGS.16508

Kim, H. (2015). *The mechanism of ageism: the relationship between perceived ageism and depressive symptoms in later life* [The Florida State University]. https://search.proquest.com/openview/225142f8269ef11c068281b5b3ebff22/1?pq-origsite=gscholar&cbl=18750

Kim, I. H., Noh, S., & Chun, H. (2016). Mediating and moderating effects in ageism and depression among the Korean elderly: The roles of emotional reactions and coping responses. *Osong Public Health and Research Perspectives*, *7*(1), 3–11. https://doi.org/10.1016/J.PHRP.2015.11.012

Kocarnik, R. A., & Ponzetti, J. J. (1986). The influence of intergenerational contact on child care participants' attitudes toward the elderly. *Child Care Quarterly*, *15*(4), 244–250. https://doi.org/10.1007/BF01120216

Kotter-Grühn, D., Kleinspehn-Ammerlahn, A., Gerstorf, D., & Smith, J. (2009). Self-perceptions of aging predict mortality and change with approaching death: 16-year longitudinal results from the Berlin Aging Study. *Psychology and Aging*, *24*(3), 654–667. https://doi.org/10.1037/A0016510

Köttl, H., Gallistl, V., Rohner, R., & Ayalon, L. (2021). "But at the age of 85? Forget it!": Internalized ageism, a barrier to technology use. *Journal of Aging Studies*, *59*. https://doi.org/10.1016/J.JAGING.2021.100971

Kwak, M., Ingersoll-Dayton, B., & Burgard, S. (2014). Receipt of care and depressive symptoms in later life: The importance of self-perceptions of aging. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *69*(2), 325–335. https://academic.oup.com/psychsocgerontology/article-abstract/69/2/325/547593

Lee, K. E., & Lee, H. W. (2019). Priming effects of age stereotypes on memory of older adults in Korea. *Asian Journal of Social Psychology*, *22*(1), 39–46. https://doi.org/10.1111/AJSP.12343

Levy, B. R. (1996). Improving memory in old age through implicit self-stereotyping. *Journal of Personality and Social Psychology*, *71*(6), 1092–1107. https://doi.org/10.1037//0022-3514.71.6.1092

Levy, B. R. (2009). Stereotype embodiment: A psychosocial approach to aging. *Current Directions in Psychological Science*, *18*(6), 332–336. https://doi.org/10.1111/J.1467-8721.2009.01662.X

Levy, B. R., & Bavishi, A. (2018). Survival advantage mechanism: Inflammation as a mediator of positive self-perceptions of aging on longevity. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *73*(3), 409–412. https://doi.org/10.1093/GERONB/GBW035

Levy, B. R., Chung, P. H., Bedford, T., & Navrazhina, K. (2014). Facebook as a site for negative age stereotypes. *Gerontologist*, *54*(2), 172–176. https://doi.org/10.1093/geront/gns194

Levy, B. R., & Myers, L. M. (2005). Relationship between respiratory mortality and self-perceptions of aging. *Psychology and Health*, *20*(5), 553–564. https://doi.org/10.1080/14768320500066381

Levy, B. R., Slade, M. D., Chang, E. S., Kannoth, S., & Wang, S. Y. (2020). Ageism amplifies cost and prevalence of health conditions. *Gerontologist*, *60*(1), 174–181. https://doi.org/10.1093/geront/gny131

Levy, B. R., Slade, M. D., Kunkel, S. R., & Kasl, S. V. (2002). Longevity increased by positive self-perceptions of aging. *Journal of Personality and Social Psychology*, *83*(2), 261–270. https://doi.org/10.1037//0022-3514.83.2.261

Levy, B. R., Slade, M. D., Murphy, T. E., & Gill, T. M. (2012). Association between positive age stereotypes and recovery from disability in older persons. *JAMA*, *308*(19), 1972–1973. https://doi.org/10.1001/JAMA.2012.14541

Levy, B. R., Zonderman, A. B., Slade, M. D., & Ferrucci, L. (2012). Memory shaped by age stereotypes over time. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *67*(4), 432–436. https://academic.oup.com/psychsocgerontology/article-abstract/67/4/432/566096

Lichtenstein, M. J., Pruski, L. A., Marshall, C. E., Blalock, C. L., Murphy, D. L., Plaetke, R., & Lee, S. (2001). The Positively Aging® teaching materials improve middle school students' images of older people. *Gerontologist*, *41*(3), 322–332. https://doi.org/10.1093/geront/41.3.322

Lu, L., Kao, S. F., & Hsieh, Y. H. (2009). Positive attitudes toward older people and well-being among Chinese community older adults. *Journal of Applied Gerontology*, *29*(5), 622–639. https://doi.org/10.1177/0733464809343289

Maier, H., & Smith, J. (1999). Psychological predictors of mortality in old age. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *54*(1). https://doi.org/10.1093/GERONB/54B.1.P44

Makris, U. E., Higashi, R. T., Marks, E. G., Fraenkel, L., Sale, J. E. M., Gill, T. M., & Reid, M. C. (2015). Ageism, negative attitudes, and competing co-morbidities - Why older adults may not seek care for restricting back pain: A qualitative study. *BMC Geriatrics*, *15*(1). https://doi.org/10.1186/s12877-015-0042-z

Meiboom, A. A., de Vries, H., Hertogh, C. M. P. M., & Scheele, F. (2015). Why medical students do not choose a career in geriatrics: A systematic review. *BMC Medical Education*, *15*(1). https://doi.org/10.1186/S12909-015-0384-4

Meisner, B. A. (2020). Are you ok, boomer? Intensification of ageism and intergenerational tensions on social media amid COVID-19. *Leisure Sciences, 43*(1–2), 56–61. https://doi.org/10.1080/01490400.2020.1773983

Murphy, D. J. (2023a). *Development and feasibility of a process based intervention to decrease internalized ageism.* [Unpublished master's thesis]. University of Manitoba.

Murphy, D. J. (2023b). *Effectiveness of a process based intervention in decreasing internalized ageism.* [Unpublished master's thesis]. University of Manitoba.

Ng, R., Allore, H. G., Trentalange, M., Monin, J. K., & Levy, B. R. (2015). Increasing negativity of age stereotypes across 200 years: Evidence from a database of 400 million words. *PloS One*, *10*(2). https://doi.org/10.1371/JOURNAL.PONE.0117086

Oeppen, J., & Vaupel, J. W. (2002). Demography: Broken limits to life expectancy. *Science*, *296*(5570), 1029–1031. https://doi.org/10.1126/science.1069675

Oscar, N., Fox, P. A., Croucher, R., Wernick, R., Keune, J., & Hooker, K. (2017). Machine learning, sentiment analysis, and tweets: An examination of Alzheimer's disease stigma on Twitter. *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, *72*(5), 742–751. https://doi.org/10.1093/geronb/gbx014

O'Shea, D. M., Dotson, V. M., & Fieo, R. A. (2017). Aging perceptions and self-efficacy mediate the association between personality traits and depressive symptoms in older adults. *International Journal of Geriatric Psychiatry*, *32*(12), 1217–1225. https://doi.org/10.1002/GPS.4584

Paling, E. (2022, August 26). *CTV exec goes on leave after Lisa LaFlamme controversy | CBC News*. CBC News. https://www.cbc.ca/news/entertainment/ctv-melling-lisa-laflamme-1.6564092

Pittis, D. (2020). *Politicians who consider sacrificing the old for the sake of the economy face a backlash*. CBC News. https://www.cbc.ca/news/business/coronavirus-covid-economy-seniors-1.5510079

Rakowski, W., & Hickey, T. (1992). Mortality and the attribution of health problems to aging among older adults. *American Journal of Public Health*, *82*(8), 1139–1141. https://doi.org/10.2105/AJPH.82.8.1139

Riddler, M. (2020). *Size of the anti-aging market worldwide 2020*. Statista. https://www.statista.com/statistics/509679/value-of-the-global-anti-aging-market/

Ritche, H. (2019). *The world population is changing: For the first time there are more people over 64 than children younger than 5 - Our World in Data*. Our World in Data. https://ourworldindata.org/population-aged-65-outnumber-children

Robertson, D. A., King-Kallimanis, B. L., & Kenny, R. A. (2016). Negative perceptions of aging predict longitudinal decline in cognitive function. *Psychology and Aging*, *31*(1), 71–81. https://doi.org/10.1037/PAG0000061

Rosales, A., & Fernández-Ardèvol, M. (2020). Ageism in the era of digital platforms. *Convergence: The International Journal of Research into New Media Technologies*, *26*(5–6), 1074–1087. https://doi.org/10.1177/1354856520930905

Sargent-Cox, K. A., Anstey, K. J., & Luszcz, M. A. (2012). The relationship between change in self-perceptions of aging and physical functioning in older adults. *Psychology and Aging*, *27*(3), 750–760. https://doi.org/10.1037/A0027578

Sargent-Cox, K. A., Anstey, K. J., & Luszcz, M. A. (2014). Longitudinal change of self-perceptions of aging and mortality. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *69*(2), 168–173. https://academic.oup.com/psychsocgerontology/article-abstract/69/2/168/544808

See, S. T. K., & Nicoladis, E. (2010). Impact of contact on the development of children's positive stereotyping about aging language competence. *Educational Gerontology*, *36*(1), 52–66. https://doi.org/10.1080/03601270903018352

Seefeldt, C. (1987). The effects of preschoolers' visits to a nursing home. *Gerontologist*, *27*(2), 228–232. https://doi.org/10.1093/geront/27.2.228

Seidler, A. L., & Wolff, J. K. (2017). Bidirectional associations between self-perceptions of aging and processing speed across 3 years. *The Journal of Gerontopsychology and Geriatric Psychiatry*, *30*(2), 49. https://psycnet.apa.org/record/2017-04574-001

Skipper, A. D., & Rose, D. J. (2021). #BoomerRemover: COVID-19, ageism, and the intergenerational twitter response. *Journal of Aging Studies*, *57*, 100929. https://doi.org/10.1016/J.JAGING.2021.100929

Smith, S. L., Pieper, K., & Choueiti, M. (2018). *Still rare, still ridiculed: Portrayals of senior characters on screen in popular films from 2015 and 2016 inclusion initiative*. https://www.semanticscholar.org/paper/Still-Rare-%2C-Still-Ridiculed-%3A-Portrayals-of-Senior-Smith-Pieper/e37ae968cef97cb98ce754c87272e4e51187e597

Soto-Perez-de-Celis, E. (2020). Social media, ageism, and older adults during the COVID-19 pandemic. *EClinicalMedicine*, *29*. https://doi.org/10.1016/J.ECLINM.2020.100634

Stewart, T. L., Chipperfield, J. G., Perry, R. P., & Weiner, B. (2012). Attributing illness to "old age:" consequences of a self-directed stereotype for health and mortality. *Psychology & Health*, *27*(8), 881–897. https://doi.org/10.1080/08870446.2011.630735

Stratton, C., Andersen, L., Proulx, L., & Sirotich, E. (2021). When apathy is deadlier than COVID-19. *Nature Aging*, *1*(2), 144–145. https://doi.org/10.1038/S43587-021-00030-W

Sutin, A. R., Stephan, Y., Carretta, H., & Terracciano, A. (2015). Perceived discrimination and physical, cognitive, and emotional health in older adulthood. *The American Journal of Geriatric Psychiatr*, *23*(2), 171–179. https://doi.org/10.1016/J.JAGP.2014.03.007

Top, M., Eris, J., & Kabalcioglu, F. (2012). Quality of life and attitudes toward aging among older women in Turkey. *Affilia*, *27*(4), 406–419. https://doi.org/10.1177/0886109912464477

Tovel, H., Carmel, S., & Raveis, V. H. (2019). Relationships among self-perception of aging, physical functioning, and self-efficacy in late life. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *74*(2), 212–221. https://doi.org/10.1093/GERONB/GBX056

United Nations. (2022a). *World Population Prospects - Population Division*. Department of Economic and Social Affairs. https://population.un.org/wpp/

United Nations. (2022b). *World Population Prospects - Total Fertility*. Department of Economic and Social Affairs Population Division. https://population.un.org/wpp/Graphs/Probabilistic/FERT/TOT/900

van der Horst, M. (2019). Internalised ageism and self-exclusion: Does feeling old and health pessimism make individuals want to retire early? *Social Inclusion*, *7*(3), 27–43. https://doi.org/10.17645/SI.V7I3.1865

Vaupel, J. W., Villavicencio, F., & Bergeron-Boucher, M. P. (2021). Demographic perspectives on the rise of longevity. *Proceedings of the National Academy of Sciences of the United States of America*, *118*(9). https://doi.org/10.1073/PNAS.2019536118

Villiers-Tuthill, A., Copley, A., McGee, H., & Morgan, K. (2016). The relationship of tobacco and alcohol use with ageing self-perceptions in older people in Ireland. *BMC Public Health*, *16*(1). https://doi.org/10.1186/S12889-016-3158-Y

Weinberger, A. (1979). Stereotyping of the elderly: Elementary school children's responses. *Research on Aging*, *1*(1), 113–136. https://doi.org/10.1177/016402757911007

Wight, R. G., LeBlanc, A. J., Meyer, I. H., & Harig, F. A. (2015). Internalized gay ageism, mattering, and depressive symptoms among midlife and older gay-identified men. *Social Science & Medicine (1982)*, *147*, 200–208. https://doi.org/10.1016/J.SOCSCIMED.2015.10.066

World Health Organization. (2015). *World report on ageing and health*. World Health Organization. https://apps.who.int/iris/handle/10665/186463

World Health Organization. (2021). *Global Report on Ageism*.

World Health Organization. (2023). *Ageism*. https://www.who.int/health-topics/ageism#tab=tab_1

Wurm, S., & Benyamini, Y. (2014). Optimism buffers the detrimental effect of negative self-perceptions of ageing on physical and mental health. *Psychology & Health*, *29*(7), 832–848. https://doi.org/10.1080/08870446.2014.891737

Xiang, X. (2020). Ageism escalates on social media. *Journal of Business*, *35*(20), 23–32.

Zhao, Y., Dupre, M. E., Qiu, L., & Gu, D. (2017). Changes in perceived uselessness and risks for mortality: evidence from a national sample of older adults in China. *BMC Public Health*, *17*(1). https://doi.org/10.1186/S12889-017-4479-1

Study 1: Development and Feasibility of a Process Based Intervention to Decrease Internalized Ageism

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Abstract

A lifetime of exposure to ageism may be internalized in older adults, and these ageist beliefs that are directed inwards can have severe consequences. However, research on reducing internalized ageism is scarce. To address this, I designed and implemented a six-week process-based intervention to reduce internalized ageism. The present study outlines the program development and feasibility findings of this intervention. The intervention was created utilizing a process-based therapy approach. It targeted mechanisms along the psychological, behavioural, and physiological pathways through which internalized ageism negatively impacts health, as specified by stereotype embodiment theory. Intervention components included education, acceptance and commitment therapy, and attributional retraining. A total of 81 participants consented to participate in the feasibility study. Participants were sent surveys following each of the six sessions, after the program concluded, and again at a two month follow up. The program was evaluated overwhelmingly positively. Most participants rated each session and the overall program as very useful. The program also maintained impressive engagement, with only three research participants dropping out of the program, and the majority completing the between-session activities. Participants also attributed a wide range of novel behaviours to this intervention and stated that they felt it changed their perspectives on ageism and/or internalized ageism. Altogether, this study provides a promising foundation from which to advance research on interventions that address internalized ageism – a problem that has severe consequences on the health and well-being of growing numbers of older adults in every country around the world.

Key words: Internalized ageism, Process-based therapy, Acceptance and commitment therapy, Attributional retraining, Feasibility

Development and Feasibility of a Process-Based Intervention to Decrease Internalized Ageism

Ageism is the stereotypes, prejudice, and discrimination levied at someone because of their age that carries harmful consequences (World Health Organization [WHO]. 2023). Older adults may internalize these ageist beliefs and direct them inwards towards the self (Levy, 2009). These negative self-perceptions of aging predict many severe negative health outcomes including poor physical and mental health, damaged social relationships, impaired cognitive performance, and decreased longevity (Chang et al., 2020). As such, the WHO (2015) highlighted reducing ageism as an important facet of improving general human well-being worldwide.

Many interventions have been developed with the aim of reducing ageism directed at others, typically from younger adults toward older adults (Burnes et al., 2019). However, interventions reducing internalized ageism are comparatively scarce. To my knowledge, there are no published studies describing theory-informed longitudinal interventions targeting internalized ageism. Recently, researchers have speculated on what techniques and theoretical foundations might prove useful in designing such an intervention (Steward, 2022). Building on these suggestions and other theoretical and empirical considerations, I developed a six-week community-based online intervention aimed at decreasing internalized ageism. This study outlines the program development and theoretical foundation, briefly describes the intervention, and presents feasibility data in a trial with community-dwelling older adults.

Interventions to reduce internalized ageism

Research on interventions designed to reduce ageism directed toward others and nascent research on manipulating self-perceptions of aging may serve as the bedrock from which to address internalized ageism. The kinds of interventions to have most commonly reduced other-directed-ageism include educational interventions that provide instruction of some kind designed to reduce ageism (e.g., Klein et al., 2005; Lee et al., 2015; Mellor et al., 2015; Snyder, 2006), intergenerational contact

interventions (e.g., Hannon & Gueldner, 2008; Pinquart et al., 2000; Yamashita et al., 2018), and those that included both education and intergenerational contact (e.g., Dorfman et al., 2003; Lytle et al., 2020; Lytle & Levy, 2019). Intergenerational contact typically involves exposing younger adults with ageist beliefs to older adults to counteract inaccurate ageist assumptions. Given that the current intervention aims to reduce internalized ageism in older adults, intergenerational contact is less relevant. Education, however, is a feasible mechanism for reducing internalized ageism. Educational interventions typically involve an instructor providing information related to the processes of aging, positive aspects of aging, age stereotypes and myths, and ageism itself (e.g., Klein et al., 2005; Lee et al., 2015; Mellor et al., 2015; Ragan & Bowen, 2001; Snyder, 2006). These strategies have also been shown efficacious in manipulating self-perceptions of aging (Beyer et al., 2019) and older adults' attitudes towards older adults (Wolff et al., 2014), with notably small effect sizes. In addition to education, narrative reframing has also been employed to successfully decrease ageism from others (Steward, 2022), and the logic of such an intervention can be appropriately applied to older adults. Thus, in borrowing from interventions that have successfully reduced ageism in others, both education and narrative reframing may be employed. Still, it is prudent to go beyond these techniques and look to theoretical and empirical evidence that suggests other modalities of intervention.

Interventions to reduce internalized ageism: A theoretical foundation

Though research on interventions addressing internalized ageism is scarce, theoretical foundations to build such interventions exist. Two theories to draw from are stereotype embodiment theory (SET; Levy, 2009) and process-based therapy (PBT; Hayes et al., 2022). SET is a theory on how ageist stereotypes are internalized and achieve their negative impact on individuals (Levy, 2009), and PBT is a theoretical basis for intervention design to best achieve therapeutic change in individuals with specific problems (Hayes et al., 2022). Together, SET and PBT work synergistically, suggesting targets to achieve a reduction in internalized ageism.

SET has four general components (Levy, 2009). First, stereotypes become internalized across the life span. Second, these internalized stereotypes can operate unconsciously. Third, these internalized stereotypes and perceptions gain salience from self-relevance (i.e., as an individual ages, internalized stereotypes towards aging become more self-relevant and thus exert more influence). Fourth, this internalized ageism negatively affects health outcomes through psychological, behavioural, and physiological pathways. This internalized ageism may manifest in older adults holding ageist beliefs toward older adults in general (Levy, 2022; Steward, 2022), but may also be directed inwards, towards oneself (Levy, 2022).

PBT focuses on targeting core mediating variables, based on testable theories (Hofmann & Hayes, 2019). This allows for the development, testing, and implementation of interventions which target measurable and modifiable mechanisms of change (i.e., process-based variables) of individual functioning, as opposed to targeting an underlying entity. In other words, it is the "contextually specific use of evidence-based processes linked to evidence-based procedures to help solve the problems… of particular people" (Hoffman & Hayes, 2019, p. 38). PBT accomplishes this by focusing on six core processes of psychological change: cognition, emotion, attention, self, motivation, and behaviour (Hayes et al., 2022). Thus, when designing an intervention to decrease internalized ageism, I sought to address all six processes of psychological change elucidated by PBT, along the psychological, behavioural, and physiological pathways posited by SET.

Interventions to reduce internalized ageism: Intervention targets

The theoretical foundation provided by SET and PBT suggest targets of an intervention designed to reduce internalized ageism and its negative consequences. Steward (2022) proposed a conceptual model for interventions to be designed to combat internalized ageism and the associated negative health outcomes along each pathway elucidated by SET (i.e., the psychological, behavioral, and

physiological pathways), highlighting potential mechanisms of change along each respective pathway. Furthermore, these potential mechanisms can act through the six processes of change within PBT.

Steward (2022) suggests multiple targets along the psychological pathway proposed by SET. These targets include self-efficacy (i.e., an individual's belief in their capacity to act in ways necessary to reach specific goals; Bandura, 1977), perceived control (i.e., one's perceived influence over outcomes or events in the environment; Chipperfield et al., 2004), and purpose in life. Self-efficacy and perceived control are related constructs; self-efficacy refers to an individual's sense of control over specific behaviours and actions, while perceived control refers to an individual's sense of control over outcomes or events. Steward suggests targeting self-efficacy by promoting physical, cognitive, and social engagement. Steward also points to evidence that perceived control (Levy, Slade, & Kasl, 2002) and purpose in life (Kim et al., 2019) mediate the psychological pathway between internalized ageism and negative health outcomes. In addition to the psychological pathway, Steward (2022) suggests mechanisms along the behavioural and physiological pathways through which SET posits internalized ageism manifests. Along the behavioural pathway, Steward suggests physical activity as a mechanism due to its established function as a mediator between ageism and health (Chang et al., 2020). Finally, for the physiological pathway, Steward (2022) points to targeting biomarkers of stress and inflammation as mediators between ageism and health (Chang et al., 2020). Stress-management techniques may be utilized to act on this mechanism.

Perceived control is a viable target of intervention due to SET considerations (Steward, 2022), and because a recent meta-analysis of psychological interventions literature found perceived control to be an effective mechanism of change that acts on the PBT processes of emotion and cognition (Hayes, 2022). Furthermore, perceived control moderates the internalization of help-seeking stigma in older adults (Murphy et al., in progress). That is, older adults higher in perceived control are less likely than those lower in perceived control to have public stigma of seeking help internalized as self-stigma of

seeking help. If internalized ageism works in the same way, perceived control should reduce the likelihood that ageism is internalized. Therefore, improvements in perceived control should both improve outcomes downstream of internalized ageism as empirical work investigating assumptions of SET would suggest and provide an upstream buffer. Finally, brief interventions targeting perceived control in older adults have increased their physical activity (Murphy et al., 2022; Sarkisian et al., 2007). As such, perceived control may also be an effective tool in promoting physical activity which may provide a secondary benefit along the behavioral pathway elucidated through SET.

The two-process model of control separates the construct of perceived control into primary and secondary control (Rothbaum et al., 1982). Primary control is the sense of control you have when your behaviours produce the intended outcome (Haynes, Heckhausen, et al., 2009). Primary control concerns are paramount when an outcome is in your control but may not be adaptive when an outcome is not in your control. When you expect your behaviors to produce some desired outcome, but this is consistently not the case, you may develop feelings of helplessness and subsequent apathy, passivity, and even depression (Hamm et al., 2019; Seligman, 1972, 1975). To account for this risk, the construct of secondary control should also be considered. Secondary control refers to an adaptive psychological state of control that can exist when goals cannot be achieved because direct influence is not possible, and an individual adjusts some aspect of themselves and accepts their circumstances (Chipperfield et al., 2012). This secondary control may be particularly important as individuals reach older adulthood.

The life-span theory of control builds on this separation of primary and secondary control and posits that maturation and aging may necessitate that secondary control goals become paramount (Heckhausen & Schulz, 1995). Research has supported this claim; for young-old adults, primary control predicts better health outcomes, but for older-old adults, secondary control is more adaptive and predicts a host of positive outcomes (Chipperfield et al., 1999). Secondary control predicts overall life-satisfaction and positive emotions (Chipperfield et al., 2012; Hall et al., 2010; Swift & Chipperfield,

2013), better self-reported health, lower severity of chronic conditions (Chipperfield et al., 1999; Hall et al., 2010; Swift & Chipperfield, 2013), fewer hospital admissions, and shorter hospital stays several years later (Chipperfield et al., 2012; Chipperfield & Perry, 2006). Furthermore, secondary control strategies predict survival up to 9 years later (Chipperfield et al., 2012; Hall et al., 2010). Moreover, secondary control predicts reduced perceived stress, depressive symptoms (Stewart et al., 2013), and regret (Newall et al., 2009). Thus, it may be that as some individuals age, their capacity to directly control their environments diminishes (Haynes, Heckhausen, et al., 2009) and accepting these aspects of aging increases one's sense of control despite not actually being in control (Chipperfield et al., 1999). This highlights the nuances of perceived control in older adult populations and suggests a need for an approach to a process-based interventions that considers both primary and secondary control. Other targets should also be considered.

Mindfulness is another important construct to target when conceptualizing an intervention rooted in SET and PBT. First, as mentioned above, Steward (2022) suggests stress-management techniques to target biomarkers of stress and inflammation along the physiological pathway posited by SET. Targeting mindfulness is one such way to achieve this, addressing the attentional process of PBT. Furthermore, researchers speculate that older adults' emotion regulation strategies may align with interventions that focus on mindfulness (Geiger et al., 2016) as older adults report higher levels of mindfulness than younger adults (Hohaus & Spark, 2013; Mackenzie et al., 2018). An approach that focuses on mindfulness in older adults is in line with the capitalization model of intervention (Geiger et al., 2016), which suggests focusing on strengths (e.g., mindfulness) and is preferable to focusing on weaknesses (Cheavens et al., 2012; Wingate et al., 2005). Adding further support for its utility, mindfulness was the second most frequent mechanism of change in a review of therapeutic outcome research (Hayes et al., 2022).

Beyond the suggestions of Steward (2022), psychological flexibility is another construct that is prudent to target in creating an intervention to reduce internalized ageism. Psychological flexibility refers to an individual's ability to be cognitively and emotionally open, to be aware of the internal and external aspects of the present moment, and to be more engaged in living a values-focused life (Falletta-Cowden et al., 2022). Psychological flexibility is the construct with the strongest evidence base as a mechanism responsible for change in the literature of psychological interventions and is successfully targeted through interventions proven effective with older adults (Hayes et al., 2022). Furthermore, psychological flexibility captures all six processes of PBT. Taken together, through the theoretical foundations and consequent targets considered above, intervention tools emerge that may prove effective in addressing internalized ageism.

Interventions to reduce internalized ageism: Intervention tools

To target internalized ageism directly, education and narrative reframing tools should be incorporated. As described above, these techniques have proven effective in reducing ageism directed towards others (Burnes et al., 2019). Furthermore, education has been efficacious in manipulating self-perceptions of aging (Beyer et al., 2019) and older adults' attitudes towards older adults (Wolff et al., 2014), with notably small effect sizes. Beyond these tools to target internalized ageism itself, tools exist to target the aforementioned mechanisms of change.

Attributional Retraining (AR) is a brief intervention designed to promote adaptive behavior by targeting cognitions, motivation, and perceived control (Haynes, Perry et al., 2009). Developed based on Weiner's (1986) attributional theory, AR was developed to improve the performance of students in competitive achievement domains (Haynes, Perry, et al., 2009). AR has been successfully adapted to target older adults by reducing tendencies to attribute negative outcomes to "old age," and instead to controllable reasons (e.g., poor strategy; Murphy et al., 2022; Sarkisian et al., 2007). By explaining outcomes as within their control, AR attempts to increase perceived control and motivation to behave

more adaptively moving forward. Furthermore, explaining negative outcomes as a function of “old age” is a near perfect representation of internalized ageism. Since AR effectively shifts these attributions, it should alter internalized ageist thinking while promoting adaptive behaviour such as physical activity (Murphy et al., 2022; Sarkisian et al., 2007). Beyond directly targeting the cognitive processes suggested by a PBT approach, AR also to achieves positive outcome along the affective, behavioural, and motivational processes (Haynes, Perry, et al., 2009). Thus, when constructing a process-based intervention to reduce internalized ageism in older adults, AR is a suitable component to incorporate. AR operates through primary control, thus tools to address secondary control should also be considered.

Third-wave cognitive behavioural therapies, such as acceptance and commitment therapy (ACT), address secondary control and have been speculated by researchers to reduce internalized ageism (Lester & Murrell, 2021). ACT is a transdiagnostic treatment (Hayes, 2019) and a prototypical PBT (Hofmann & Hayes, 2019). ACT attempts to increase psychological flexibility through targeting six distinct components of the psychological flexibility model (Hayes et al., 2011). These six components include acceptance (i.e., willingness to contact negative or unwanted experiences), defusion (i.e., separating oneself from one’s thoughts), perspective taking (i.e., keeping perspective of oneself within one’s experiences), mindfulness (i.e., being in touch with and aware of one’s experiences), values (i.e., awareness of what is of value, purpose, or meaning in one’s life), and committed action (i.e., behaving in values-consistent ways in one’s life).

There are several reasons to consider ACT as an intervention to reduce internalized ageism within a PBT approach. The six components of the psychological flexibility model act on the six processes of PBT; (1) defusion acts on cognition, (2) acceptance acts on emotion, (3) mindfulness acts on attention, (4) perspective taking acts on self, (5) values act on motivation, and (6) committed action acts on behavior (Hayes et al., 2022). Researchers suggest the use of ACT in interventions for older adults due to its transdiagnostic nature and targeting of increasing acceptance rather than avoidance of difficult

private experiences (Hayes et al., 1996; Roberts & Sedley, 2016). Furthermore, researchers have speculated that ageism may manifest due to avoidance of aging (Nelson, 2005). Given that ACT directly attempts to reduce experiential avoidance (Hayes et al., 1999), it may help circumvent the development of internalized ageism in the first place. Finally, ACT has also been used to decrease problematic constructs related to internalized ageism, such as internalized self-stigma (Luoma et al., 2008), internalized shame (Luoma & Platt, 2015), and mental-health related stereotypes and stigma (Masuda et al., 2007).

In addition to the theoretical and empirical justifications for utilizing ACT in targeting internalized ageism, it is also congruent with an intervention developed based on SET. ACT techniques may address mechanisms of change along the pathways SET suggests internalized ageism manifests and impacts health. First, to address the physiological pathway, Steward (2022) recommends mindfulness interventions that reduce stress, which is one of the six components in the ACT model (Hayes, 2019; Hayes et al., 2011, Hayes et al., 2022). Second, to address the psychological pathway, Steward suggests attempting to increase older adults' purpose in life, which is one of the six components of psychological flexibility in ACT (Hayes, 2019; Hayes et al., 2011). Third, along the behavioural pathway, the committed action component of ACT may be leveraged to promote physical activity. Additionally, the acceptance component of the ACT psychological flexibility model may address secondary control and thus compliment AR. Finally, ACT utilizes perspective taking techniques to target the self-process that are similar to narrative reframing, which is a technique Steward suggests may be pivotal in increasing physical activity and decreasing internalized ageism (Burnes et al., 2019; Busso et al., 2019; Sweetland et al., 2017). Thus, ACT may address internalized ageism, congruent with the recommendations Steward draws from a SET-informed approach.

In summary, though many interventions have been successful in reducing ageism (Burnes et al., 2019), much prior research in this area has lacked a coherent theoretical foundation, has not explicitly

explored underlying mechanisms of change, and there has been little work done to reduce internalized ageism. Some intervention tools used to reduce ageism, such as education and narrative reframing, may translate to reducing internalized ageism. However, others, such as intergenerational contact, may be less fruitful for this purpose. There is little literature addressing internalized ageism directly. However, drawing on empirical research and theoretical frameworks to target mechanisms along pathways put forth by SET and the processes of PBT, many tools such as AR and ACT may prove effective in developing a PBT intervention to reduce internalized ageism. As demonstrated above, these theories and techniques may act syngeristically to accomplish the goals of decreasing internalized ageism and buffering its negative consequences by targeting potential mechanisms of change across the six processes targeted by PBT. Taken all together, the stage is set to develop a theory-informed, process-based intervention aimed at decreasing internalized ageism.

Objective and hypotheses

This study evaluated the feasibility of a six-week process-based intervention aimed at decreasing internalized ageism in a sample of community dwelling older adults. This feasibility study had three main objectives. The first objective was to determine program engagement. I hypothesized most participants would find the intervention relevant and engaging and therefore remain in it until completion and engage with the assigned activities. The second objective was to determine how useful participants found the program. I hypothesized most participants would consider the program as useful. The third objective was to determine whether participants felt the program resulted in change within themselves. I hypothesized that program would result in shifted views of ageism and/or internalized ageism and meaningful behavioural changes.

Method

Participants and Design

I recruited participants from a pool of 207 individuals who registered for the six-session program via email that provided details of the current study. Of these 207, approximately 150 took part in the intervention. Participants were able to partake in the intervention through computer, smart device, and landline telephone. However, our recruitment for research and all research related surveys were done online. Thus, the research sample was largely limited to those who participated by computer or smart device. The exact number intervention participants is not known because participation in the research component was not required to participate in the intervention. For those who did consent to participate in the research component, inclusion criteria included (1) 55+ years of age, and (2) fluency in spoken and conversational English. A total of 81 participants consented to participate in the research, however three of these participants consented to participate after baseline data was collected and thus only provided anonymous feedback after each session. Three participants withdrew from the study. See Table 1 for sociodemographic data of participants who provided baseline data and did not withdraw (*N* = 75).

All surveys were sent as via a link to an online survey contained in an email. Participants completed online confidential questionnaires containing a full outcome battery described in study two at baseline (i.e., prior to the intervention starting), immediately following the intervention, and again at a two-month follow up (Murphy, 2023b). Only sociodemographic data and questions pertaining to behaviour change were utilized from these confidential surveys. Participants also provided anonymous feedback following each session, which contained the data utilized for all other analyses in the current study.

Table 1

Sample Sociodemographic Characteristics

Characteristic	***n***	**%**
Gender		
Male	6	8.0
Female	69	92.0
Education		
High school or equivalent	7	9.3
College diploma, or trade certificate/diploma	13	17.3
Bachelor's degree	30	40.0
Graduate degree	25	33.3
Race/ethnicity		
White	62	82.7
Indigenous	3	4.0
Filipino	3	4.0
Latin American	3	4.0
Chinese	1	1.3
South Asian	2	2.7
Black	1	1.3
Marital status		
Married or Common Law	36	48.0
Separated or Divorced	19	25.3
Widowed	13	17.3
Single (Never Married/Common Law)	7	9.3
Household income		
$0-$50,000	15	20.0
$50,000-$100,000	45	60.0
$100,000+	15	20.0
Occupation status		
Full-time employed	4	5.3
Part-time employed	9	12.0
Volunteer	2	2.7
Retired	60	80.0
Age (*M*, *SD*)	70.56	6.39

Note. N = 75. Participants' age ranged from 58 – 85 years old.

Intervention

The online intervention included six weekly sessions. Each individual session was approximately 90-minutes long, and consisted of video lectures, small group discussions, in-session individual activities, assigned between-session activities, and bonus activities. All sessions were conducted over Zoom and participants were able to join by computer, smart device, or telephone. Although I was not able to track

how participants joined, few if any participants in the research study used this option. Activities and video lectures were pre-recorded in a studio and streamed live to intervention participants. Participants chose whether to receive handouts of all slides shown in video lectures, and all activities as physical copies by mail, or electronically via email. Discussion portions of the intervention took place in Zoom break-out rooms, lasted 15 minutes, and consisted of approximately four to six participants. I was the primary facilitator of all sessions. A co-facilitator assisted with participant questions. A volunteer assisted with calling in intervention participants who chose to join by telephone and assigning these participants to break-out rooms. Two employees of Information Services and Technology assisted with technical issues.

The intervention design was based on the theoretical foundations elucidated above. Additionally, several older adult community organizations advised the development of the interventions and provided feedback on whether the intervention would be well received by the older adults they serve. An academic advisory board also aided in program development. The following sections outline the three key components of the intervention (i.e., education, ACT, and AR) and outline each session.

Education

The education included in this intervention spanned the topics of ageism, internalized ageism, the negative consequences of ageism, positive views of aging, and psychoeducation related to the other intervention components discussed below. Furthermore, education was used to encouraged participants to reframe how they view aging, and to facilitate participants creating their own personal definitions of what it means to age successfully. Education targeted both cognitive and self-processes of PBT.

ACT

Techniques from all six components of the psychological flexibility model of ACT (i.e., defusion, perspective taking, acceptance, mindfulness, awareness of values, and committed action) were utilized

in the intervention (e.g., Harris, 2022; Hayes, 2019). These techniques targeted participants' psychological flexibility with respect to the construct of internalized ageism. Participants learned to separate themselves from their thoughts, take on new perspectives on aging, accept their internal experiences as they are, be present with their experiences, identify their values concerning aging, and create plans to commit to actions in line with their identified values. Narrative reframing was incorporated as a component of perspective taking. Participants created narratives based on their views of themselves in the context of aging at the beginning of the intervention, and again at the end of the intervention. ACT targeted all six processes of PBT (i.e., cognitive, emotional, self, attentional, motivational, and behavioural processes).

AR

AR targeted participants' perceived control and aimed to reduce their tendency to attribute negative outcomes to "old age." This included a brief video discussing the importance of attributing outcomes to something controllable (vs. uncontrollable). Attributing outcomes to "old age" was used as an example of uncontrollable attributions (i.e., something to avoid). Special consideration was also given to (1) identifying what is and what is not in your control and (2) adjusting expectations based on circumstance. Example behaviours used to explain concepts included physical activity and utilizing technology. Afterwards, participants discussed the video and reflected on how this might be applied to their own lives in break-out rooms as a means of consolidation. AR targeted the cognitive, emotional, and motivational processes of PBT.

Intervention Overview

For a more detailed description of all activities completed within session, between session, and bonus activities provided, see Appendix 1.

Session One

Prior to session one, participants wrote a narrative about themselves in the context of aging to be revisited throughout the intervention. Session one began with the facilitator introducing the six-week program. Next, participants joined their assigned break-out rooms to introduce themselves and then watched a video lecture on ageism, what it is, examples of it, and its implications. Participants then joined their break-out rooms to discuss ageism. Next, participants completed a brief mindfulness activity that walked them through noticing details of their hands (Harris, 2022). Subsequently, participants watched a video explaining how to employ mindfulness when encountering ageism. Finally, they watched an educational lecture containing information on positive perspective of aging (e.g., Gendron, 2022; Levy, 2022). Participants were given an activity to complete prior to the next session, which included taking time to notice ageism in the world and reflect on it using mindfulness techniques. Bonus activities included various mindfulness techniques (e.g., breath meditation, lovingkindness meditation, expanding and narrowing attention). This session largely targeted self and attentional process of PBT.

Session Two

Participants began session two discussing the between-session assignment (i.e., noticing ageism) in breakout rooms. Following this, they watched an educational lecture on internalized ageism (i.e., what it is, examples of it, and its consequences) and participated in an activity in which mindfulness was employed to notice any internalized ageism within themselves. Next, participants discussed internalized ageism in breakout groups. Afterwards, they took part in two cognitive defusion exercises from ACT (Harris, 2022; Hayes, 2019). The first was an activity in which participants placed the phrase “I am having the thought that” before internalized ageist thinking such as “I am too old.” The second activity, called “leaves on a stream,” had participants picture troubling thoughts and memories drifting by like leaves on a stream. Participants were encouraged to imagine thoughts influenced by internalized ageism. Participants then watched a video describing how to employ mindfulness and cognitive defusion

when encountering ageism. Participants were given an activity to complete in-between sessions that instructed them to reflect and use mindfulness to identify thoughts and beliefs within themselves potentially influenced by ageism. Participants were given several cognitive defusion exercises as bonus activities and encouraged to use them to unhook from any thoughts and beliefs they identified to be influenced by ageism (e.g., giving their minds a name, giving their minds a different voice, imagining thoughts being sung, and worksheets to separate from thoughts). This session largely targeted cognitive processes of PBT.

Session Three

Participants began session three discussing the previously assigned activity of identifying internalized ageism and employing cognitive defusion in breakout rooms. They then watched a video including psychoeducation on perspective taking inspired by ACT (Hayes, 2019) and took part in an activity encouraging them to reflect on the aging narratives they wrote prior to session one during this video. Participants were encouraged to employ cognitive defusion techniques to the labels and unhelpful narratives they place on themselves. Participants then discussed their aging narratives in discussion groups. Following the discussion, they engaged in a perspective taking activity in which they were guided through seeing themselves as the one having the thought, and not the thought itself (see Hayes, 2019). Finally, participants watched a video summarizing the content presented in the program so far, and a demonstration of how to employ the skills to everyday situations involving ageism. Participants were assigned a between session activity to reflect on the aging narratives they had prepared, to consider whether it had been influenced by ageism, and to employ perspective taking techniques with these narratives. Bonus activities included perspective taking activities taken from ACT (e.g., asking themselves “who is noticing that” when noticing thoughts, feelings, and sensations; Hayes, 2019). This session primarily focused on the self-process of PBT.

Session Four

Participants began session four reflecting on the program in breakout rooms. Following this, they watched a video discussing differences between primary and secondary control. Participants were introduced to techniques from ACT to deal with aspects of life not in one's control (Hayes, 2019), and AR to shift mindsets surrounding aspects of life that are in one's control. Participants then watched the AR video. Afterwards, participants discussed applying the shift in mindset away from the "old age" attribution to their own lives in breakout rooms. Subsequently, participants watched a video lecture including information on acceptance and took part in an ACT-based acceptance activity. In this activity, they reflected on an aspect of aging outside of their control, and worked to accept it for what it was, consider how they might learn from it, and reflect on what accepting it would allow them to do. Finally, participants watched a video describing how to apply the skills taught in the program to instances of encountering ageism. Participants were given a summary of the AR and various acceptance exercises to reflect on and complete between sessions. These acceptance exercises included saying "yes" to various external and internal phenomena, envisioning a challenging experience and utilizing metaphors to accept this experience with kindness, and taking an outside perspective on difficult experiences. This session primarily targeted motivational, behavioural, and emotional process of PBT.

Session Five

Participants began session five discussing mindset shifts and acceptance in discussion groups. Afterwards they watched a video lecture introducing the concept of personal values from an ACT perspective, that included an activity guiding them to identifying their own values. In this "birthday party" activity, participants were instructed to imagine what they hope friends and loved ones would say about them at a fictional birthday and extract personal values from these speeches. Participants were also asked to envision older adults they admired and reflect on what values these individuals displayed. Afterward, participants watched another video that demonstrated applying values to one's

own perspective of aging well. They were encouraged to see aging well as living through their own values, as opposed to meeting some external standards that may be influenced by ageism. Afterwards, participants discussed the values of other older adults they admired, and what their own personal definitions of aging well might look like in breakout rooms. Subsequently, they took part in an activity where they began to construct their own definitions of aging well from the perspective of their own values. Finally, participants watched a video applying the skills taught in the program to examples of ageism. The between session activity had participants reflect on and deepen their personal values-informed definitions of aging well. Bonus activities included various ACT worksheets to assist with the identification of personal values (e.g., Hayes, 2019). These included worksheets containing lists of values and worksheets that instructed participants to identify areas of their life they care about and reflect on them. This session primarily focused on motivational process of PBT.

Session Six

Participants began this final session discussing their personal definitions of aging well in breakout rooms. Subsequently, they watched a video that included psychoeducation on values-aligned behaviours from an ACT perspective and took part in an activity to identify behaviours that were in line with their identified values and personal definitions of aging well through a SMART goals framework (i.e., making the behaviours specific, measurable, attainable, relevant to their values, and time-bound). Next, participants watched a video that contained psychoeducation on behaviour change and habit formation. They then discussed behaviours they wished to commit to and how they might integrate them into their lives in breakout rooms. Afterwards, participants watched a video that summarized the program, reviewed how to use all the skills taught throughout the intervention synergistically, and included information on countering common ageist myths encountered in the world. Finally, participants were instructed to rewrite their narratives of themselves in the context of aging from the perspective of their own values and personal definitions of aging well. They were then instructed to

compare these to the narratives they wrote at the beginning of the program and reflect on the differences after the session had concluded and participants had access to their original narratives. Worksheets that summarized skills taught in the program were provided. This session primarily targeted behavioural and self-processes of PBT.

Measures

Sociodemographic

Participants provided sociodemographic information as part of the confidential questionnaires. See Table 1 for the sample sociodemographic data.

Program Engagement

Attendance was not kept during the program because not every participant provided consent. Thus, participant response rates to the question "How useful was this session to you?" were used as a proxy for continued engagement throughout the program. This question was sent as part of the anonymous feedback surveys following each session. Participants also responded to the questions "Did you complete the between-session activities we assigned after each session?" and "Did you complete any of the bonus activities after each session?" as 1 (*yes*) or 2 (*no*) to measure engagement with program materials. This was sent as part of the final anonymous feedback questionnaire sent out after the final session.

Program Usefulness

Participants responded to "How Useful was this session for you?" on a scale from 1 (*Not Very Useful)* to 5 *(Very Useful*). The weighted average of all participants scores measured perceived usefulness for each individual session. Participants also answered, "How useful was the program for you?" after the final session, on the same rating scale. The weighted average of all participants scores measured perceived program usefulness. This question was part of the anonymous feedback surveys.

Participant Change

Participants responded to the question “Has the program as a whole changed any of your thoughts/reflections related to ageism (i.e., negative stereotypes and beliefs about older adults) or internalized ageism (i.e., taking on negative stereotypes and beliefs of older adults and directing them at yourself or other older adults)?” This item measured whether participants felt that the program had shifted their views on ageism and/or internalized ageism. Participants responded to this question as part of the anonymous survey questionnaire following the final session.

Participants were also asked “As a result of this program, have you engaged in any new behaviours/actions or tried new things?” If participants responded yes to this question, they were prompted “Please share some examples of new behaviours/actions you have done, or new things you have tried.” Participants responded to these questions as part of the confidential questionnaires immediately following the conclusion of this program, and again at a two month follow up.

Results

Feasibility data supported my hypothesis that program engagement would remain high throughout the program. Across the six sessions, the average response rate to the session-by-session feedback survey was 94.9% and ranged between 92.6% and 98.8%. Furthermore, only three participants (3.7%) who consented to take part in the study dropped out. In terms of engagement with the between-session activities, 80.8% of respondents indicated that they completed the assigned between session activities, and 79.5% indicated that they completed the bonus activities. These results suggest consistently high attendance and active engagement with the intervention material in between sessions.

Feasibility data also supported my hypothesis that participants would perceive the program as useful. Both the usefulness of each session and the usefulness of the entire program were rated overwhelmingly positively. See Table 2 for the weighted average rating, and the distribution of ratings for each session individually and the whole program.

Table 2

Session and Intervention Usefulness Ratings

	Session Number (*N*)						
	One (78)	**Two (80)**	**Three (75)**	**Four (75)**	**Five (77)**	**Six (76)**	**Program (79)**
Rating	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**
5	34 (43.6)	41 (51.3)	35 (46.7)	39 (52.0)	46 (59.7)	50 (65.8)	52 (65.8)
4	22 (28.2)	22 (27.5)	25 (33.3)	24 (32.0)	22 (28.6)	20 (26.3)	20 (25.3)
3	16 (20.5)	13 (16.3)	11 (14.7)	8 (10.7)	7 (9.1)	6 (7.9)	5 (6.3)
2	4 (5.1)	4 (5.0)	4 (5.3)	3 (4.0)	2 (2.6)	0 (0.0)	2 (2.5)
1	2 (2.6)	0 (0.0)	0 (0.0)	1 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)
Average	4.05	4.25	4.21	4.29	4.45	4.58	4.54

Note. 5 on the rating scale was defined as "Very Useful" and 1 was defined as "Not Useful." Average = the weighted average of ratings for the respective session. Program = Responses given to the question asking participants to rate the entire program once the program concluded (i.e., not a specific session).

Feasibility data also supported my hypothesis that participants would perceive themselves as changed by the program. Most participants (88.7%) indicated that their views on ageism and/or internalized ageism had shifted. Furthermore, participants attributed a wide range of novel behaviours to the intervention. Immediately following the program, 60 (80.0%) of the 75 respondents indicated that they had engaged in new behaviours/actions or tried new things. Of the 71 respondents at the two-month follow up, 60 (84.5%) indicated that they had engaged in new behaviours/actions or tried new things. I analyzed and organized into categories the open-ended responses to the behaviour change question using basic summative content analysis (Hsieh & Shannon, 2005). See Table 3 for a list of categories, descriptions, and example quotes. See Table 4 for the frequency count of each respective category. Note that participant responses were allowed to be placed in multiple categories when relevant (e.g., when participants listed several behaviour changes). Thus, one participant's response may appear across several categories**.**

Table 3

Codebook of the new behaviours attributed to the intervention by participants

Category	Description	Example Quote
Intervention Activities and Tools	New behaviour involving one of the techniques explicitly taught within the intervention.	"I've been meditating daily, separating, accepting, putting them on leaves on a stream... All daily. This has been life changing for me."
Physical Activity	Participants report increasing their levels of physical activity	"I've finally gone back to the [exercise gym]. Thoroughly enjoying it – aerobics classes, zumba, yoga, weights, etc."
Learning/Cognitive Activities	Participants state that they have engaged in new behaviours that require intentional cognitive engagement and/or learning	"[I] applied to a master's program at the university."
Trying New Things	Participants state they have engaged in something they have never done before	"As part of Winnipeg Comedy Festival, I'm getting ready to do my first open mic comedy event today and I couldn't be more excited. I used to think I was too old to do that."
Increased Family Time	Participants state that they are spending more time with their family	"I've started... making sure I talk to my children every day."
Ageism Awareness	Participants report an increased awareness of ageism and/or internalized ageism	"I catch myself more often when my own internalized ageism beliefs and attitudes are making me feel less adequate, or when the reflex response is to put myself down when I forget something or see my wrinkled face in the mirror each morning. I am more often able to see past my internalized negative biases and treat myself and others more kindly."
Meeting new people	Participants report engaging in behaviours that have led to meeting new people	"I've just returned for a 1.5 week vacation I went on by myself after the program ended. I booked it three weeks into the program. I met so many people!"
Volunteering	Participants state they have engaged in volunteer activity	"I've been using a Ukrainian/English translator on my phone to help volunteer to speak with Ukrainian newcomers to Winnipeg. I got over my shyness of not speaking Ukrainian. It's been wonderful and I've made several meaningful connections"

(Table 3 continued)

(Table 3 continued)

Category	Description	Example Quote
Spending Time with Friends	Participants state that they are spending more time with their friends	"I have made a concerted effort to meet with friends and family members on outings."
Miscellaneous Self-Care	This category captures behaviours that are beneficial to the participant's well-being that are not captured by other categories	"[I] joined a Fibromyalgia support group"
Writing	Participants state that they have started writing, or increased the amount of writing they engage in	"I've started writing an autobiography"
Ageism Activism	Participants report engaging in behaviours to intentionally combat ageism, or report a readiness to do so	"I am also more aware of internalized ageism and able to catch myself especially around negative body image; it's still a struggle, but awareness is the first step and I now have that… I take ageism more seriously; seeing it in the same category as racism and sexism makes me more ready to push back against it."
Artistic and Musical Activity	Participants state that they have either began or increased an artistic or musical activity	"Started playing guitar again"
Travel	Participants state that they have engaged in travel	"I went on a vacation by myself for the first time, something I always wanted to do but was too nervous."
Dietary changes	Participants state that they have made dietary changes or consulted with dieticians	"I took a cooking class and have actually started to cook again versus buying prepared food. I have already had 2 appointments with a dietician with the goal of eating food to support aging well."
Completing Tasks	Participants state that they have completed tasks they had previously been putting off	"I finished painting my ceilings and walls!! I thought I'd never do it again and I paced myself to adjust. So, I finished it which was incredible."
Seeking Mental Health Services	Participants state that they have sought professional help for mental health concerns	"I have started seeing a mental health therapist to help me get through the challenges and struggles of caregiving."
Organizing affairs	Participants state that they are organizing their affairs	"Getting affairs in order to prepare for retirement by contacting relevant parties."
Relating to Other Differently	Participants state that they relate to others differently in some way	"More tolerance to younger people's ignorance [and] a positive view of myself and other older adults"

(Table 3 continued)

(Table 3 continued)

Category	Description	Example Quote
Business	Participants state that they have engaged in business endeavours	"I've started a floral business"
Improving sleep habits	Participants state that they have made intentional effort to improve sleep habits	"Working on better sleep, actually trying to go to bed earlier so I can get 7-8 hrs of sleep."
Increased work	Participants state that they have begun working more because they enjoy it	"'I've been happily picking more shifts at my job and actually enjoying it."

Table 4

Frequency counts of categories of new behaviours identified by participants in open-ended responses.

	Time 1	Time 2	Total
New Behaviour	**n**	**n**	**n**
Intervention Activities and Tools	28	27	55
Physical Activity	24	24	48
Learning/Cognitive Activities	8	13	21
Trying New Things	8	12	20
Increased Family Time	9	9	18
Meeting new people	6	11	17
Ageism Awareness	5	9	14
Volunteering	7	7	14
Spending Time with Friends	5	9	14
Miscellaneous Self-Care	5	6	11
Seeking Mental Health Services	5	6	11
Ageism Activism	4	4	8
Artistic and Musical Activity	3	5	8
Travel	2	6	8
Dietary changes	2	3	5
Completing Tasks	2	2	4
Seeking Mental Health Treatment	1	3	4
Organizing affairs	2	1	3
Relating to Other Differently	2	1	3
Business	1	1	2
Improving sleep habits	1	1	2

Note. N = 60 for each time point, representing only the participants who indicated they engaged in novel behaviours. Participant responses were allowed to be placed into multiple categories when relevant. Time 1 = Responses from post intervention confidential survey. Time 2 = Responses from two-month follow up confidential survey.

Discussion

Initial data supports the feasibility of this six-week online intervention designed to reduce internalized ageism and its negative consequences for community-dwelling older adults. Though attendance was not recorded, response rates to weekly anonymous feedback surveys suggested that close to 90% of participants consistently attended the program throughout. Additional confidential surveys supported this notion with only 3 of the 78 individuals who initially consented to the intervention dropping out before the program concluded. Beyond attendance, engagement with program material was high as indicated by responses to both the assigned and bonus between session activities. Even at a two month follow up, many participants indicated that they continued to employ the intervention activities in their daily lives. The usefulness of the sessions were also rated exceptionally well, with most of the total ratings receiving the highest possible rating. Furthermore, over four-fifths of participants reported that the program accomplished its goal in shifting their perspectives on ageism and internalized ageism. Finally, in the eyes of the participants, the intervention led to several tangible behaviour changes. Overall, the program seems to be engaging, perceived as useful, and feasibly effective in changing the attitudes and behaviours of participants.

Participants attributed changes in behaviours to the intervention that reflected altered views of aging that may be suggestive of reductions in internalized ageism. This was true of internalized ageism, and ageism more generally. Participants wrote that the intervention led to an increased awareness of internalized ageism, with one participant highlighting the importance of awareness in fighting internalized ageism. Other participants highlighted that they are more often able catch themselves when internalized ageist beliefs are negatively impacting them. Further still, some reported engaging in behaviours they previously thought they were too old to do. Thus, from a phenomenological perspective, the intervention was successful in reducing internalized ageism for most participants. This increased awareness also led to participants acting against ageism. For instance, one participant shared

how they talked to their children and friends about taking a different perspective on ageism because of the intervention. Another shared that they now recognize ageism as being a part of the same category as racism and sexism, and they are more ready to push back against it. Beyond its impact on internalized ageism, the program components were well received.

Most participants indicated that they completed the intervention activities in between sessions. These tools and activities were chosen to target the mechanisms suggested by Steward (2022) and thus act on internalized ageism and its negative consequences. Beyond this reported engagement with the intervention activities between session, incorporating the tools that were provided within the intervention into their daily lives was the most common category of behaviour change reported. This was true immediately following the intervention and at a two month follow up. This is profound given that participants were not directly instructed to do this. Positive intervention-related behaviour changes included the incorporation of mindfulness, cognitive defusion, acceptance, values-based living, perspective taking, behaviour formation techniques, and AR mindset-shifts. This is especially promising, since these techniques work together to target psychological flexibility, which is the most common construct that mediates change in the world's literature on psychological intervention outcomes (Hayes et al., 2022). In terms of specific skills, mindfulness was commonly reported as a tool integrated into the participants lives. Older adults tend to report more mindfulness than younger adults to begin with (Hohaus & Spark, 2013; Mackenzie et al., 2018). This supports the notion that interventions targeting relative strengths may be more effective than targeting relative weaknesses (Cheavens et al., 2012). Furthermore, mindfulness was second only to psychological flexibility in terms of its frequency of mediating therapeutic outcome change (Hayes et al., 2022). Beyond utilizing the tools of the intervention, participants reported various other forms of behaviour that may be adaptive in terms of protecting against internalized ageism and its consequences.

Steward (2022) highlights change in physical activity as an important behavioural lever to pull in protecting against the negative health outcomes of internalized ageism. Increases in physical activity was the second most reported change in behaviour. This ranged from activities such as increased walking, joining fitness classes, and hiring personal trainers. That physical activity was so commonly reported to have increased because of this program is promising, especially given that it was never explicitly prescribed. Though examples of adjusting exercise goals and avoiding attributing a lack of exercise to "old age" was employed as one example in the AR portion of the intervention, participants were never directly instructed to increase levels of physical activity. Still, AR has been demonstrated to reliably increase physical activity in older adults, and thus may be in part responsible for this increase in physical activity (Murphy et al., 2022; Sarkisian et al., 2007). ACT techniques may also have contributed to this change in behaviour. It is possible that when participants were instructed to identify behaviours that aligned with their personal values, they chose behaviours that increase physical activity. In support of the notion that ACT may have contributed to the increases in physical activity, ACT interventions focused on internalized stigma have led to better quality of life, reductions in self-stigma relating to weight, as well as reductions in body mass, even though the intervention did not focus on weight or weight loss (Lillis et al., 2009). Given that physical activity has been found to mediate the internalized ageism and health outcomes in previous research (Chang et al., 2020), the current intervention may potentially buffer against negative health consequences downstream of internalized ageism.

Steward (2022) also suggested physical, social, and cognitive engagement as strategies to increase self-efficacy, a mechanism to reduce internalized ageism and buffer its negative impact. In addition to the physical engagement expounded upon above, participants provided several examples of social and cognitive engagement as new behaviours they attributed to the intervention. Social engagement included joining new committees and clubs, purposefully meeting new people, spending more intentional time with family and friends, and for one participant, trying stand-up comedy for the

first time. Like physical activity, participants were never directly prescribed to increase social and cognitive engagement. Once again, this speaks to the utility of such a program, especially given that physical, cognitive, and social engagement are suggested ways to increase self-efficacy (Steward, 2022). Self-efficacy has been shown to mediate the connection between life-style factors and internalized ageism (Steward & Hasche, 2022), and the relationship between internalized ageism and multiple health outcomes (Klusmann et al., 2019; Levy, Slade, Kunkel, et al., 2002; Tovel et al., 2019; Yeom, 2014). Participants may have been avoiding physical, social, and cognitive tasks that they valued due to internalized ageism. Thus, once internalized ageism was removed as a barrier, and participants were encouraged to act in a values-aligned manner, these valued activities may have naturally occurred. This again suggests that this program may, in addition to addressing internalized ageism, buffer against its negative consequences.

Limitations

This initial feasibility data is extremely promising; however, it should be interpreted in lieu of its limitations. Though there was very little attrition within the sample when compared to typical rates of attrition in psychological interventions that range from 18% to 40% (Roseborough et al., 2016), there are several limitations surrounding the sample. Though participant ages varied, the sample was predominantly female, White, and highly educated. Ageism may intersect with other forms of discrimination that are not highly represented in the current sample. As a result of the relatively homogenous sample, I cannot conclude with certainty that this program is feasible for all older adults. Still, ageism is an experience nearly every older adult will face, and the program was designed to have each participant adapt it to their own lives and experience. Theoretically, the material should generalize across groups of people. Second, this intervention was hosted on Zoom, and although individuals had the option of participating by landline telephone with program materials mailed to them, the recruitment and research methodology was all conducted online. Again, though we did not track how

participants joined, this likely limited the research sample to participants who used smart devices and computers. Thus, results may not generalize to older adults without access to internet, or without familiarity with online technology. Additionally, this data is only suggestive of effectiveness. The second study of this thesis formally evaluates change on self-report measures of internalized ageism, and the mechanisms through which this change is achieved (Murphy, 2023b). Furthermore, future research should incorporate a control group to establish causality in any such reduction and mediation. With these limitations in mind, initial feasibility data is extremely promising, and suggestive of a potentially useful community intervention to reduce internalized ageism.

Conclusion

To conclude, this intervention, to my knowledge, represents the first substantive longitudinal intervention based in established theory to target internalized ageism among older adults. Rooted in SET and based on suggestions by Steward (2022), a PBT approach was utilized to target internalized ageism through various mediating mechanisms. This intervention was well received by participants; it was overwhelmingly rated as very useful, maintained high levels of engagement throughout, and was reported as effective in changing views of ageism and internalized ageism. Furthermore, and perhaps most importantly, participants attributed several tangible behaviour changes to the intervention—changes that may have a protective impact against the negative consequences of internalized ageism. Thus, this study may serve as the first step towards implementing a theory-based intervention that reduces internalized ageism and improves the lives of large and growing numbers of community-dwelling older adults.

References

Angiullo, L., Whitbourne, S. K., & Powers, C. (1996). The effects of instruction and experience on college students' attitudes toward the elderly. *Educational Gerontology*, *22*(5), 483–495. https://doi.org/10.1080/0360127960220507

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215.

Beyer, A. K., Wolff, J. K., Freiberger, E., & Wurm, S. (2019). Are self-perceptions of ageing modifiable? Examination of an exercise programme with vs. without a self-perceptions of ageing-intervention for older adults. *Psychology and Health*, *34*(6), 661–676. https://doi.org/10.1080/08870446.2018.1556273

Burnes, D., Sheppard, C., Henderson, C. R., Wassel, M., Cope, R., Barber, C., & Pillemer, K. (2019). Interventions to reduce ageism against older adults: A systematic review and meta-analysis. In *American Journal of Public Health* (Vol. 109, Issue 8, pp. E1–E9). American Public Health Association Inc. https://doi.org/10.2105/AJPH.2019.305123

Busso, D. S., Volmert, A., & Kendall-Taylor, N. (2019). Reframing aging: Effect of a short-term framing intervention on implicit measures of age bias. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *74*(4), 559–564. https://doi.org/10.1093/GERONB/GBY080

Chang, E. S., Kannoth, S., Levy, S., Wang, S. Y., Lee, J. E., & Levy, B. R. (2020). Global reach of ageism on older persons' health: A systematic review. *PLOS ONE*, *15*(1), e0220857. https://doi.org/10.1371/JOURNAL.PONE.0220857

Cheavens, J. S., Strunk, D. R., Lazarus, S. A., & Goldstein, L. A. (2012). The compensation and capitalization models: A test of two approaches to individualizing the treatment of depression. *Behaviour Research and Therapy*, *50*(11), 699–706. https://doi.org/10.1016/j.brat.2012.08.002

Chipperfield, J. G., Newall, N. E., Perry, R. P., Stewart, T. L., Bailis, D. S., & Ruthig, J. C. (2012). Sense of control in late life: Health and survival implications. *Personality & Social Psychology Bulletin*, *38*(8), 1081–1092. https://doi.org/10.1177/0146167212444758

Chipperfield, J. G., & Perry, R. P. (2006). Primary- and secondary-control strategies in later life: Predicting hospital outcomes in men and women. *Health Psychology*, *25*(2), 226–236. https://doi.org/10.1037/0278-6133.25.2.226

Chipperfield, J. G., Perry, R. P., & Menec, V. H. (1999). Primary and secondary control-enhancing strategies: Implications for health in later life. *Journal of Aging and Health*, *11*(4), 517–539. https://doi.org/10.1177/089826439901100403

Dorfman, L. T., Murty, S., Ingram, J. G., & Evans, R. J. (2003). Incorporating intergenerational service-learning into an introductory gerontology course. *Journal of Gerontological Social Work*, *39*(1–2), 219–240. https://doi.org/10.1300/J083v39n01_18

Falletta-Cowden, N., Smith, P., Hayes, S. C., Georgescu, S., & Kolahdouzan, S. A. (2022). What the body reveals about lay knowledge of psychological flexibility. *Journal of Clinical Medicine*, *11*(10). https://doi.org/10.3390/jcm11102848

Geiger, P. J., Boggero, I. A., Brake, C. A., Caldera, C. A., Combs, H. L., Peters, J. R., & Baer, R. A. (2016). Mindfulness-based interventions for older adults: A review of the effects on physical and emotional well-being. *Mindfulness*, *7*(2), 296. https://doi.org/10.1007/S12671-015-0444-1

Gendron, T. (2022). *Ageism unmasked: Exploring age bias and how to end it*. Steerforth Press.

Hall, N. C., Chipperfield, J. G., Heckhausen, J., & Perry, R. P. (2010). Control striving in older adults with serious health problems: A 9-year longitudinal study of survival, health, and well-being. *Psychology and Aging*, *25*(2), 432–445. https://doi.org/10.1037/a0019278

Hamm, J. M., Kamin, S. T., Chipperfield, J. G., Perry, R. P., & Lang, F. R. (2019). The detrimental consequences of overestimating future health in late life. *The Journals of Gerontology: Series B*, *74*(3), 373–381.

Hannon, P. O., & Gueldner, S. H. (2008). The impact of short-term quality intergenerational contact on children's attitudes toward older adults. *Journal of Intergenerational Relationships*, *5*(4), 59–76. https://doi.org/10.1300/J194v05n04_05

Harris, R. (2022). *The happiness trap: How to stop struggling and start living* (2nd ed.). Shambhala.

Hayes, S. C. (2019). *A liberated mind: How to pivot toward what matters.* Avery, and imprint of Penguin Random House LLC.

Hayes, S. C., Ciarrochi, J., Hofmann, S. G., Chin, F., & Sahdra, B. (2022). Evolving an idionomic approach to processes of change: Towards a unified personalized science of human improvement. *Behaviour Research and Therapy*, *156*, 104155. https://doi.org/10.1016/J.BRAT.2022.104155

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). Acceptance and commitment therapy: An experiential approach to behavior change. In *New York*. Guilford Press. http://books.google.com/books?hl=en&lr=&id=CTgSzAdxc8cC&pgis=1

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2011). *Acceptance and commitment therapy: The process and practice of mindful change*. Guildford Press.

Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, *64*(6), 1152–1168. https://doi.org/10.1037/0022-006X.64.6.1152

Haynes, T. L., Heckhausen, J., Chipperfield, J. G., Perry, R. P., & Newall, N. E. (2009). Primary and secondary control strategies: Implications for health and well-being among older adults. *Journal of Social and Clinical Psychology*, *28*(2), 165–197. https://doi.org/10.1521/JSCP.2009.28.2.165

Haynes, T. L., Perry, R. P., Stupnisky, R. H., & Daniels, L. M. (2009). A review of attributional retraining treatments: Fostering engagement and persistence in vulnerable college students. In *Higher Education: Handbook of Theory and Research* (pp. 227–272). https://doi.org/10.1007/978-1-4020-9628-0_6

Heckhausen, J., & Schulz, R. (1995). A life-span theory of control. *Psychological Review*, *102*(2), 284–304. https://doi.org/10.1037/0033-295X.102.2.284

Hofmann, S. G., & Hayes, S. C. (2019). The future of intervention science: Process-based therapy. *Clinical Psychological Science*, *7*(1), 37–50. https://doi.org/10.1177/2167702618772296

Hohaus, L. C., & Spark, J. (2013). Getting better with age: Do mindfulness & psychological well-being improve in old age? *European Psychiatry*, *28*, 1. https://doi.org/10.1016/S0924-9338(13)77295-X

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, *15*(9), 1277–1288. https://doi.org/10.1177/1049732305276687

Kim, H., Thyer, B. A., & Munn, J. C. (2019). The relationship between perceived ageism and depressive symptoms in later life: Understanding the mediating effects of self-perception of aging and purpose in life, using structural equation modeling. *Educational Gerontology*, *45*(2), 105–119. https://doi.org/10.1080/03601277.2019.1583403

Klein, D. A., Council, K. J., & McGuire, S. L. (2005). Education to promote positive attitudes about aging. *Educational Gerontology*, *31*(8), 591–601. https://doi.org/10.1080/03601270591003355

Klusmann, V., Sproesser, G., Wolff, J. K., & Renner, B. (2019). Positive self-perceptions of aging promote healthy eating behavior across the life span via social-cognitive processes. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *74*(5), 735–744. https://doi.org/10.1093/GERONB/GBX139

Knapp, J. L., & Patricia Stubblefield, J. D. (2000). Changing students' perceptions of aging: The impact of an intergenerational service learning course. *Educational Gerontology*, *26*(7), 611–621. https://doi.org/10.1080/03601270050200617

Lee, Y.-S., Shin, S.-H., & Greiner, P. A. (2015). Can education change attitudes toward aging? A quasi-experimental design with a comparison group. *Journal of Nursing Education and Practice*, *5*(9). https://doi.org/10.5430/jnep.v5n9p90

Lester, E. G., & Murrell, A. R. (2021). An experimental study of mindfulness and acceptance-based skills for internalized ageism in older adults and college students. *Aging & Mental Health*, *26*(7), 1487–1494. https://doi.org/10.1080/13607863.2021.1950613

Levy, B. (2022). *Breaking the age code: How your beliefs about aging determine how long & well you live*. HarperCollins.

Levy, B. R., Slade, M. D., & Kasl, S. V. (2002). Longitudinal benefit of positive self-perceptions of aging on functional health. *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, *57*(5). https://doi.org/10.1093/geronb/57.5.P409

Levy, B. R., Slade, M. D., Kunkel, S. R., & Kasl, S. V. (2002). Longevity increased by positive self-perceptions of aging. *Journal of Personality and Social Psychology*, *83*(2), 261–270. https://doi.org/10.1037//0022-3514.83.2.261

Lillis, J., Hayes, S. C., Bunting, K., & Masuda, A. (2009). Teaching acceptance and mindfulness to improve the lives of the obese: A preliminary test of a theoretical model. *Annals of Behavioral Medicine*, *37*(1), 58–69. https://doi.org/10.1007/S12160-009-9083-X

Luoma, J. B., Kohlenberg, B. S., Hayes, S. C., Bunting, K., & Rye, A. K. (2008). Reducing self-stigma in substance abuse through acceptance and commitment therapy: Model, manual development, and pilot outcomes. *Addiction Research and Theory*, *16*(2), 149–165. https://doi.org/10.1080/16066350701850295

Luoma, J. B., & Platt, M. G. (2015). Shame, self-criticism, self-stigma, and compassion in Acceptance and Commitment Therapy. *Current Opinion in Psychology*, *2*, 97–101. https://doi.org/10.1016/J.COPSYC.2014.12.016

Lytle, A., & Levy, S. R. (2019). Reducing ageism: Education about aging and extended contact with older adults. *Gerontologist*, *59*(3), 580–588. https://doi.org/10.1093/geront/gnx177

Lytle, A., Nowacek, N., & Levy, S. R. (2020). Instapals: Reducing ageism by facilitating intergenerational contact and providing aging education. *Gerontology and Geriatrics Education*, *41*(3), 308–319. https://doi.org/10.1080/02701960.2020.1737047

Mackenzie, C. S., Karaoylas, E., & Starzyk, K. B. (2018). Changes in eudaimonia across the lifespan: A cross-sectional comparison of younger, middle-aged, and older adults. *Journal of Happiness Studies*, *19*(8), 2465–2487.

Masuda, A., Hayes, S. C., Fletcher, L. B., Seignourel, P. J., Bunting, K., Herbst, S. A., Twohig, M. P., & Lillis, J. (2007). Impact of acceptance and commitment therapy versus education on stigma toward people with psychological disorders. *Behaviour Research and Therapy*, *45*(11), 2764–2772. https://doi.org/10.1016/J.BRAT.2007.05.008

Mellor, D., McCabe, M., Rizzuto, L., & Gruner, A. (2015). Respecting our elders: Evaluation of an educational program for adolescent students to promote respect toward older adults. *American Journal of Orthopsychiatry*, *85*(2), 181–190. https://doi.org/10.1037/ort0000041

Murphy, D. J. (2023b). *Effectiveness of a process based intervention in decreasing internalized ageism.* [Unpublished master's thesis]. University of Manitoba.

Murphy, D. J., Chipperfield, J. G., Chuchmach, L. P., Perry, R. P., Parker, P. C., Hamm, J. M., & Dryden, R. (2022). Pilot test of the viability of an intervention to improve causal thinking and foster quality of life among older adults. *Centre on Aging Spring Symposium*.

Murphy, D. J., Mackenzie, C. S., Hamm, J. M., & Dryden, R. (in progress). *Perceived control moderates the internalized stigma model in older adults*.

Nelson, T. D. (2005). Ageism: Prejudice against our feared future self. *Journal of Social Issues*, *61*(2), 207–221. https://doi.org/10.1111/J.1540-4560.2005.00402.X

Newall, N. E., Chipperfield, J. G., Clifton, R. A., Perry, R. P., Swift, A. U., & Ruthig, J. C. (2009). Causal beliefs, social participation, and loneliness among older adults: A longitudinal study. *Journal of Social and Personal Relationships*, *26*(2–3), 273–290. https://doi.org/10.1177/0265407509106718

Pinquart, M., Wenzel, S., & Sörensen, S. (2000). Changes in attitudes among children and elderly adults in intergenerational group work. *Educational Gerontology*, *26*(6), 523–540. https://doi.org/10.1080/03601270050133883

Ragan, A. M., & Bowen, A. M. (2001). Improving attitudes regarding the elderly population: The effects of information and reinforcement for change. In *The Gerontologist* (Vol. 41, Issue 4). https://academic.oup.com/gerontologist/article/41/4/511/600715

Roberts, S. L., & Sedley, B. (2016). Acceptance and commitment therapy with older adults. *Clinical Case Studies*, *15*(1), 53–67. https://doi.org/10.1177/1534650115589754

Rothbaum, F., Weisz, J. R., & Snyder, S. S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology*, *42*(1), 5–37. https://doi.org/10.1037//0022-3514.42.1.5

Sarkisian, C. A., Prohaska, T. R., Davis, C., & Weiner, B. (2007). Pilot test of an attribution retraining intervention to raise walking levels in sedentary older adults. *Journal of the American Geriatrics Society*, *55*(11), 1842–1846. https://doi.org/10.1111/J.1532-5415.2007.01427.X

Seligman, M. E. (1972). Learned helplessness. *Annual Review of Medicine*, *23*, 407–412. https://doi.org/10.1146/annurev.me.23.020172.002203

Seligman, M. E. P. (1975). *Helplessness: On depression, development, and death*. W. H. Freeman.

Slotnick, H. B., Reichelt Wadena, C. R., & Gardner, R. (1985). *Gifted students meet the institutionalized elderly: learning about aging and the aged in a rural nursing home*.

Snyder, J. R. (2006). The influence of instruction on college students' attitudes toward older adults. In *Gerontology and Geriatrics Education* (Vol. 26, Issue 2, pp. 69–79). https://doi.org/10.1300/J021v26n02_05

Steward, A. (2022). Toward interventions to reduce internalized ageism. *Journal of Human Behaviour in the Social Environment*, *32*(3), 336–355. https://doi.org/10.1080/10911359.2021.1898516

Steward, A., & Hasche, L. (2022). Exploring lifestyle activities to reduce internalized ageism: Self-efficacy as a mediator between exercise, volunteering, computer use, and self-perceptions of aging. *International Journal of Aging and Human Development*, *94*(3), 255–272. https://doi.org/10.1177/00914150211024175

Stewart, T. L., Chipperfield, J. G., Ruthig, J. C., & Heckhausen, J. (2013). Downward social comparison and subjective well-being in late life: The moderating role of perceived control. *Aging and Mental Health*, *17*(3), 375–385. https://doi.org/10.1080/13607863.2012.743963

Sweetland, J., Volmert, A., & O'Neil, M. (2017). *Finding the frame: An empirical approach to reframing aging and ageism. A frameworks research report*.

Swift, A. U., & Chipperfield, J. G. (2013). Secondary control belief combinations (Adjustment and Acceptance) and well-being in older adults. *Canadian Journal on Aging*, *32*(4), 349–359. https://doi.org/10.1017/S0714980813000391

Tovel, H., Carmel, S., & Raveis, V. H. (2019). Relationships among self-perception of aging, physical functioning, and self-efficacy in late life. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *74*(2), 212–221. https://doi.org/10.1093/GERONB/GBX056

Wingate, L. R. R., van Orden, K. A., Joiner, T. E., Williams, F. M., & Rudd, M. D. (2005). Comparison of compensation and capitalization models when treating suicidality in young adults. *Journal of Consulting and Clinical Psychology*, *73*(4), 756–762. https://doi.org/10.1037/0022-006X.73.4.756

Wolff, J. K., Warner, L. M., Ziegelmann, J. P., & Wurm, S. (2014). What do targeting positive views on ageing add to a physical activity intervention in older adults? Results from a randomised controlled trial. *Psychology and Health*, *29*(8), 915–932. https://doi.org/10.1080/08870446.2014.896464

World Health Organization. (2023). *Ageism*. https://www.who.int/health-topics/ageism#tab=tab_1

World Health Organization. (2015). *World report on ageing and health*. World Health Organization. https://apps.who.int/iris/handle/10665/186463

Yamashita, T., Hahn, S. J., Kinney, J. M., & Poon, L. W. (2018). Impact of life stories on college students' positive and negative attitudes toward older adults. *Gerontology and Geriatrics Education*, *39*(3), 326–340. https://doi.org/10.1080/02701960.2017.1311884

Yeom, H. E. (2014). Association among ageing-related stereotypic beliefs, self-efficacy and health-promoting behaviors in elderly Korean adults. *Journal of Clinical Nursing*, *23*(9–10), 1365–1373. https://doi.org/10.1111/JOCN.12419

Appendix 1: Intervention Activity Descriptions

Activity Name	Place in Program	Description
Aging Narrative	Prior to Session 1	Participants were asked to write a narrative about their aging self. They were instructed to start with how old they were, and then write about how they imagined themselves as they aged into the future.
Mindfulness of the Hand	Within Session 1	Participants were guided through a mindfulness activity in which they were instructed to pay close and curious attention to various aspects of their hands.
Noticing Ageism in the World	Assigned After Session 1	Participants were given a handout that instructed them to reflect on ageism they notice in between sessions, to write down examples, to consider what stereotypes this was communicating, and then to use mindfulness to reflect on how it makes them feel.
Mindfulness of the Hand	Bonus Activity After Session 1	Participants were provided with the script for the mindfulness activity carried out within session 1.
Breath Meditation	Bonus Activity After Session 1	Participants were provided with a brief description of a meditation practice involving focusing on one's breath.
Broaden and Narrow Attention	Bonus Activity After Session 1	Participants were provided with a brief description of a mediation that involves listening to a piece of music, and altering back and forth between focusing on the song as a whole, and focusing on specific instruments.
Lovingkindness Mediation	Bonus Activity After Session 1	Participants were provided with a script that guided them through a lovingkindness meditation, directing love and kindness to the self, and to others.
Noticing Internalized Ageism	Within Session 2	Participants were guided through an activity in which they were encouraged to reflect on any ageist thoughts or beliefs they may carry about themselves, and to notice the thoughts, feelings, and sensations that accompany them.
I am Having the Thought…	Within Session 2	Participants were guided through a defusion activity in which they considered something they were telling themselves they were too old to do, and to place the phrase "I am having the thought that…" in front of it.
Leaves on a Stream	Within Session 2	Participants were guided through a meditation in which they were instructed to imagine troubling thoughts, feelings, and sensations as leaves on a stream, floating by as they watched from the riverbank.

Noticing Internalized Ageism	Assigned After Session 2	Participants were given a handout that instructed them to reflect on any thoughts or beliefs about aging that might be influenced by ageism, to reflect on the feelings and sensations that come with these thoughts or beliefs, and then to let them float by like leaves on a stream.
Leaves on a Stream Metaphor	Bonus Activity After Session 2	Participants were provided with the script for the leaves on a stream activity carried out in session.
Give your mind a name	Bonus Activity After Session 2	Participants were provided with a description of a cognitive defusion activity in which you give your mind a name, and listen to it politely.
Giving your mind a voice	Bonus Activity After Session 2	Participants were provided with a description of a cognitive defusion activity in which you give your mind a voice different than your own.
Imagine your thought being sung	Bonus Activity After Session 2	Participants were provided with a description of a cognitive defusion activity in which you recite your thoughts back to yourself in the tune of a song.
I am/I am not	Bonus Activity After Session 2	Participants were provided a worksheet walking them through a cognitive defusion activity in which they identify two positive and one negative attributes about themselves, and through a series of step, create space between themselves and these attributes.
Aging Narrative Reflection	Within Session 3	Participants were instructed to reflect on the aging narratives they wrote prior to session 1. They were asked to consider what story they are telling themselves, whether the story is influenced by ageism, and how strongly they feel attached to the story. Afterwards they were instructed to let the labels the story provided float away using the leaves on a stream metaphor.
I am Aware…	Within Session 3	Participants were guided through a brief perspective taking activity in which they were instructed to think of a label they place on themselves to do with aging, to place "I am aware of the thought that..." in front of the label and repeat it to themselves, then to place "I am not the thought that..." in front of the label and repeat it to themselves.
Aging Narrative Reflection	Assigned After Session 3	Participants were provided a handout that expanded on the within session reflection on aging narratives. They were asked to write about how their narratives frame aging, whether it may be influenced by ageism, and how strongly they feel attached to it. They were then instructed to use the leaves on a stream metaphor with their story and then reflect on whether it changed their perspective.

I am Aware…	Bonus Activity After Session 3	Participants were provided with the script from the "I am Aware" activity carried out within session.
And who is noticing that?	Bonus Activity After Session 3	Participants were given a brief description of a perspective taking activity in which they are encouraged to create a habit of asking themselves "and who is noticing that?" to build perspective taking skills.
Attributional Retraining	Within Session 4	Participants were shown a video that walked them through the process of explaining aspects of their life that are in their control through controllable attributions. Specifically, examples of avoiding saying "I am too old to do…" were given. Examples used were physical activity and using technology. Participants were encouraged to adopt controllable explanations such as "I am using the wrong strategy" or "I need to shift my goal slightly" when not achieving the outcomes they desire.
Acceptance	Within Session 4	Participants were guided through an activity in which they were instructed to reflect on an aspect of their life related to aging outside of their control. They were guided through noticing physical sensations and specific thoughts associate with this experience and practiced saying "yes" to these. They also reflected on whether they could learn something from this experience, what the experience suggests they care about, how someone might grow from this experience, whether they know others with a similar experience, and what accepting the experience would allow them to do.
Mindset Shift	Assigned After Session 4	Participants were given a handout that listed several uncontrollable attributions (e.g., "I'm too old") and several controllable attributions (e.g., "I've used the wrong strategies (I can use better strategies)" and instructed to reflect on how they can apply this shift in mindset towards controllable attributions to their own life.
Saying Yes	Assigned After Session 4	Participants were given a handout that included an activity in which they consider objects around a room and mentally say "no" to these objects, then repeat it but this time, say "yes." Afterwards, they are instructed to apply this to internal experiences.
A Caring Exercise	Assigned After Session 4	Participants were given a handout that included an activity in which they envision an experience they have a hard time accepting, and practice envision accepting it through metaphors, such as though looking at the experience as if it were a painting or holding the experience in your hand like a delicate flower.

Applying Perspective Taking to Acceptance	Assigned After Session 4	Participants were given a handout that contained a description of several brief acceptance exercises to practice, including an activity in which they consider an aging experience they struggle with, and through a series of prompts, try and view themselves from an outside perspective, and then considering what advice they would give themselves regarding their suffering, from this outside perspective.
Attributional Retraining	Bonus Activity After Session 4	Participants were provided with the script of the within session Attributional Retraining video.
Acceptance	Bonus Activity After Session 4	Participants were provided with the script of the within session acceptance activity.
100th Birthday Party	Within Session 5	Participants were asked to imagine themselves at their 100th birthday party, and to picture their loved ones giving speeches about what they stood for as a person. They were then instructed to try and extract two values they hold in life from these imagined speeches.
Someone You Admire	Within Session 5	Participants were instructed to reflect on an older adult they admire, and why they admire them. They were then asked to imagine what this person aging well would look like, in terms of living in line with that older adult's values.
Creating Personal Definitions of Aging Well	Within Session 5	Participants were asked to reflect on their values, to consider someone who supports these values, what this support looks like, what an act of self-compassion they could do to support their own values might be, what it feels like to live through these values, and what it feels like when not living through these values. They were then instructed to imagine what their life looks like when living through these values, and then consider how they might live up to these values as they age.
Personal Definitions of Aging well	Assigned After Session 5	Participants were instructed to write down at least two values they have, then to write down answers to the questions presented in the creating personal definitions of aging well activity completed within session 5. Participants were also asked to answer how these values might guide their behaviour, and what some behaviours they might choose to commit to are. Finally, they were asked to write a personal definition of aging well through the lens of their own values.
100th Birthday Party	Bonus Activity After Session 5	Participants were given a handout that walked them through the 100th birthday party activity carried out within session 5, with room to write in responses and reflection.

Someone You Admire	Bonus Activity After Session 5	Participants were given a handout that walked them through the Someone You Admire activity carried out within session 5, with room to write in responses and reflection.
Values List	Bonus Activity After Session 5	Participants were given a handout that contained several examples of values to assist with identifying their own values.
Values Writing	Bonus Activity After Session 5	Participants were given a worksheet that guided them through an activity in which they rated certain areas of their life in terms of importance, then were prompted to write answers to questions surrounding the areas of life they identified as important. They were encouraged to reflect on why they care about these areas, when these values became important, what pursuing this value looks like, what they might do to manifest more of that value, and what happens when they violate that value.
Drawing Out Sweetness	Bonus Activity After Session 5	Participants were given a worksheet in which they were encouraged to reflect on moments in their life when they felt especially connected to certain values they hold, and to draw a picture of the first thing that comes to mind when thinking about what these values say about what they wish to put into the world. After, they were encouraged to reflect on what they drew.
Identifying Behaviours	Within Session 6	Participants were guided through an activity in which they considered one behaviour that was aligned with each of their values identified in the previous session. Participants were instructed to conceptualize it through a SMART goals framework (i.e., make the behaviour specific, measurable, attainable, relevant [to their values], and time-bound).
Aging Narratives	Assigned After Session 6	Participants were provided with a handout that asked them to write a narrative about their aging self in the same way they were asked to prior to session 1; however, this time, they were instructed to consider their values and personal definitions of aging well while writing this narrative. Participants were encouraged to compare this with their original narrative and reflect on differences.
SMART Goals	Bonus Activity After Session 6	Participants were provided with a handout that summarized SMART Goals.
Identifying Behaviours	Bonus Activity After Session 6	Participants were provided with a handout that walked them through the identifying behaviours activity completed within session 6.
Six Skills Summary	Bonus Activity After Session 6	Participants were provided with a handout that summarized the six acceptance and commitment therapy skills taught throughout the program (i.e., mindfulness, defusion, perspective taking, acceptance, values, and committed action).

Study 2: Effectiveness of a Process Based Intervention in Decreasing Internalized Ageism

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Abstract

Background and Objectives: A lifetime of exposure to ageism may be internalized in older adults, and this can have severe consequences. However, little research has addressed reducing internalized ageism. Thus, I designed and implemented a six-week process-based intervention to reduce internalized ageism. This intervention utilized education, acceptance and commitment therapy, and attributional retraining to target theoretically based mechanisms of change (i.e., psychological flexibility, mindfulness, and perceived control). **Methods:** A total of 78 older adults who participated in the intervention consented to participate in research. Participants completed questionnaires prior to the intervention, immediately following the intervention, and at a two-month follow-up. **Results:** Participants' internalized ageism was significantly reduced following the intervention and maintained at follow up; reductions were associated with large effect sizes. Furthermore, reductions in internalized ageism were mediated by increases in psychological flexibility, mindfulness, and perceived control. **Discussion:** This study provides initial data that supports the effectiveness of this process-based intervention targeting a reduction of internalized ageism. This has the potential to reduce the deleterious consequences of internalized ageism impacting older adults across the globe.

Key words: Process-based therapy, Acceptance and commitment therapy, Attributional retraining, Mediation, Internalized ageism

Effectiveness of a Process Based Intervention in Decreasing Internalized Ageism

Ageism (i.e., the stereotypes, prejudice, and discrimination directed toward someone based on age; World Health Organization [WHO], 2023) carries severe consequences. Internalizing ageist beliefs and directing it towards oneself in older age predicts a multitude of negative health outcomes, including worsened cognitive performance, poorer physical and mental health, and decreased longevity (Chang et al., 2020). These consequences are so deleterious, the WHO (2015) identified the reduction of ageism as a key target in improving general human health across the globe.

In contrast to the large body of literature evaluating interventions designed to decrease ageism directed towards others (Burnes et al., 2019), research on reducing internalized ageism is scarce. However, researchers have begun to provide theoretical speculation and empirical tools that may be helpful in designing such an intervention (e.g., Steward, 2022). Building on these suggestions and other theoretical and empirical considerations, I developed a six-week community-based intervention aimed at decreasing internalized ageism. This study evaluated the effectiveness of this intervention in decreasing internalized ageism, and the mechanism(s) through which intervention-related improvements in outcomes were hypothesized to take place.

An Intervention to Decrease Internalized Ageism

Though research on reducing internalized ageism is in its nascent stage, theoretical foundations exist from which to build such interventions. Two such foundations are process-based therapy (PBT; Hayes et al., 2022), and stereotype embodiment theory (SET; Levy, 2009). PBT is the "contextually specific use of evidence-based processes linked to evidence-based procedures to help solve the problems… of particular people" (Hofmann & Hayes, 2019, p. 38). The evidence-based processes fall into six functionally important processes of change (Hayes et al., 2022). These processes include emotional, cognitive, motivational, attentional, behavioural, and self-processes. These six processes are captured by the term psychological flexibility, which is an individual's ability to be cognitively and emotionally

open, to be aware of the internal and external aspects of the present moment, and to be more engaged in living a values-focused life (Falletta-Cowden et al., 2022). Interventions targeting psychological flexibility address all six processes of change. SET, on the other hand, explains the process by which ageist stereotypes, messaging, and motives are internalized within individuals (Levy, 2009). SET posits that these internalized ageist beliefs negatively impact health outcomes through psychological, behavioural, and physiological pathways. Taken together, by targeting the six functionally important processes of change, and the pathways through which SET posits internalized ageism manifests, the theoretical stage is set to create an intervention.

Building from this foundation, Steward (2022) proposed a conceptual model for interventions designed to combat internalized ageism. Steward suggests targeting mechanisms shown to mediate internalized ageism's negative impact on health outcomes along each of the three pathways posited by SET. Targeting these mechanisms can act through the six processes of change within PBT. These targets include self-efficacy (self-process), perceived control and purpose in life (motivational process), and physical activity and biomarkers of stress and inflammation (behavioural process). Steward also suggests targeting education (cognitive process) and narrative reframing (self-process) due to their established effects in decreasing ageism towards others.

Several empirically supported tools were chosen to address various mechanisms along the pathways posited by SET, acting on the six functional processes of PBT. I chose several tools from acceptance and commitment therapy (ACT), a transdiagnostic third-wave cognitive behavioural therapy (Hayes et al., 2022). ACT targets psychological flexibility and thus acts on all six processes of PBT. The specific components of ACT can simultaneously target the mechanisms Steward (2022) suggests along the pathways posited by SET. He recommends mindfulness interventions that reduce stress, which is one of the six components in the psychological flexibility ACT model (attentional process; Hayes, 2019; Hayes et al., 2022). Additionally, mindfulness was the second most frequent mechanism of change in a

review of therapeutic outcome research (Hayes et al., 2022). Furthermore, values-based living components of ACT may address purpose in life (motivational processes); behaviour modification embedded within ACT may be leveraged to promote physical activity (behavioural processes); self-efficacy (self-processes); and narrative reframing exercises in ACT may prove useful in addressing internalized ageism itself (self-processes). The intervention also incorporated attributional retraining (AR) to target perceived control. AR encourages older adults to avoid attributing outcomes in their life to "old age," and instead to something they can control (Murphy et al., 2022). Brief AR interventions promote adaptive behaviour by targeting cognitions, motivation, and perceived control (cognitive and motivational processes; Haynes, Perry, et al., 2009). The final pillar of the intervention consisted of education surrounding ageism, internalized ageism, and more positive perspectives of aging (cognitive process). Education was employed due to its success in targeting the reduction of ageism toward others (Burnes et al., 2019) and has been used in the small body of literature demonstrating shifts in self-perceptions of aging (Beyer et al., 2019; Wolff et al., 2014). For a more detailed outline of program logic and development, see Murphy (2023a).

In summary, I created an intervention to target internalized ageism from a PBT paradigm, rooted in SET. This intervention employs ACT, AR, and education to target mechanisms of change rooted in established theory and empirical research. To my knowledge, this is the first longitudinal, theory-informed intervention aimed at decreasing internalized ageism.

Objectives and Hypotheses

The primary aim of this study was to evaluate the effectiveness of a six-week process-based intervention aimed at decreasing internalized ageism, and the mechanisms through which any reduction was achieved. Hypothesis 1 was that participants would have reduced levels of internalized ageism (i.e., more positive self-perceptions of aging and more positive perceptions of older adults) immediately following the intervention and at a two month follow up, compared to baseline levels. Hypothesis 2 was

that participants would also experience improvement in the mechanisms or mediators that are theoretically linked to reduced internalized ageism (i.e., psychological flexibility, mindfulness, and perceived control). Hypothesis 3 was that change in process-based mechanisms would mediate the positive change in participants' self-perceptions of aging and perceptions of older adults from baseline to post-intervention, and from baseline to two-month follow up.

Method

Participants and Design

I recruited participants from a pool of 207 individuals who registered for the six-week intervention via email that provided details of the current study. Of these 207, approximately 150 took part in the intervention. The precise number is unknown because participating in the research study was not necessary to participate in the intervention. The inclusion criteria for those who consented to participate in the research study was, (1) understanding written and spoken English, and (2) 55+ years of age. In total, 78 older adults consented to participate in this research project, with three withdrawing. Three additional participants did not respond to the time three survey and were listwise deleted from analysis, leaving 72 total participants. Participants completed an online battery of self-report measures described below in a two-week period before (time 1 [T1]), immediately after (time 2 [T2]), and two months after (time 3 [T3]) the six-week intervention. The measures contained within the battery, and the questions within each measure, were presented in random order.

Intervention

The intervention consisted of six weekly 90-minute sessions on Zoom. Each session consisted of pre-recorded videos, small group discussions, in-session activities, and between-session activities. The intervention was developed based on evidence-based tools and through consultation with an academic advisory board and several older adult community organizations. See Murphy (2023a) for a detailed overview of the intervention.

Measures

Sociodemographics

Participants provided sociodemographic information including age, gender, marital status, occupational status, household income, education, and population group/ethnicity. See Table 1 for the sample sociodemographic data.

Table 1

Sample Sociodemographic Characteristics

Characteristic	***n***	**%**
Gender		
Male	6	8.3
Female	66	91.7
Education		
High school or equivalent	7	9.7
College diploma, or trade certificate/diploma	12	16.7
Bachelor's degree	29	40.3
Graduate degree	24	33.3
Race/ethnicity		
White	59	81.9
Indigenous	3	4.2
Filipino	3	4.2
Latin American	3	4.2
Chinese	1	1.4
South Asian	2	2.8
Black	1	1.4
Marital status		
Married or Common Law	34	47.2
Separated or Divorced	18	25.0
Widowed	13	18.1
Single (Never Married/Common Law)	7	9.7
Household income		
$0-$50,000	15	20..8
$50,000-$100,000	42	58.3
$100,000+	15	20.8
Occupation status		
Full-time employed	4	5.6
Part-time employed	9	12.5
Volunteer	2	2.8
Retired	57	79.2
Age (*M*, *SD*)	70.44	6.44

Note. N = 72. Participants' age ranged from 58 – 85 years old.

Ageism Outcomes

Self-Perceptions of Aging

The Self Perceptions of Aging Scale (SPA; Kleinspehn-Ammerlahn et al., 2008) measured internalized ageism. Items (e.g., "The older I get, the more useless I feel") were rated by participants on a 5-point rating scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly agree*). Negative questions were reverse coded and higher scores thus indicate more positive self-perceptions of aging. Internal consistency was good (α = .88).

Perceptions of older adults

Participants' perceptions of other older adults were assessed using Levy and Langer's (1994) method that requires them to list the first five words that come to mind when they think of someone who is 80 years old. Two coders blindly rated each unique word based on their valence as 1 (*positive*), 0.5 (*neutral*), or 0 (*negative*). Inter-rater reliability was excellent (90.2% agreement). The average score of both coders was taken in the case of disagreement. The numerical values assigned to each word were summed for a total score. Higher scores represent more positive views of older adults.

Mediators

Psychological Flexibility

The 7-item Acceptance and Action Questionnaire II Revised (AAQ-II; Bond et al., 2011) measured psychological flexibility, which captures each of the six processes within PBT. Items (e.g., "My painful memories prevent me from having a fulfilling life") were rated by participants on a on a 5-point rating scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly agree*). Scores were reversed such that higher scores indicate greater psychological flexibility. Internal consistency was excellent (α = .91).

Mindfulness

The 5-item Mindful Attention Awareness Scale – Short Form (MAAS-SF; Osman et al., 2016) measured mindfulness, which this scale operationalizes as present-moment awareness. Items (e.g., "I

find myself doing things without paying attention") were rated by participants on a 5-point rating scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly agree*). Scores were reversed such that higher scores indicate greater mindfulness. Internal consistency was good (α = .88).

Perceived Control

Seven items measuring perceived control across life domains among older adults (i.e., physical health, social activities, leisure, mental well-being, everyday activities, aging, and life in general) from Chipperfield et al., (2004) and Hladkyj et al. (2000) measured perceived control. Participants responded to each item (e.g., "Indicate the amount of control you feel you have over your aging") with a 5-point rating scale ranging from 1 (*Almost no control*) to 5 (*Almost total control*). Higher scores represent higher levels of PC. Internal consistency was good (α = .85).

Statistical Analysis

I tested hypotheses 1 and 2 concerning changes in measures across three time points using repeated measures ANOVAs with each outcome and mediator. Partial eta squared (η_p^2) scores to determined effect size of ANOVA analyses, with .01, .06, and .14 indicating small, medium, and large effects, respectively (Cohen, 1988). Post-hoc comparisons determined which time points significantly differed. Bonferroni correction controlled for the family-wise error rate of 21 comparisons across seven measures (α = .002).

I tested hypotheses 3 (i.e., changes in the outcome variables would be mediated by changes in the mediators) with The PROCESS version 4.1 macro for SPSS (Model 4; Hayes, 2018). For each outcome variable, I first evaluated the change from T1 to T2 in the outcome variable as a function of the change score in the mediating variables from T1 to T2. The indirect effect of each mediator was evaluated in isolation, followed by a parallel mediation model. These analyses were repeated for change from T1 one to T3 scores, utilizing change scores in the mediating variables from T1 to T3 as the mediator. Each mediation analysis employed 5,000 bootstrapped samples to create 95% confidence intervals to probe

the relationships in the mediation analysis. Mediation effects were considered significant when indirect effects did not cross zero. The random number generator was seeded to 22222 to allow for exact replication of analysis.

Results

Data Cleaning and Descriptive Analysis

Missing data were minimal (< 0.3%) and appeared random across participants. Thus, missing data was replaced with the average response to the other items on the measure for those with 80% complete data on any given measure. Participants with less than 80% complete data on any measure were pairwise deleted from relevant analyses. This is a prudent course of action when there is little missing data, data is not systematically missing, and there is adequate power (Cheema, 2014). This resulted in a total of 71 participants with valid data for analyses including perceptions of older adults, and 72 participants for all other analyses. Means, standard deviations, and zero-order correlations of all measures within the models are shown in Table 2.

Table 2

Zero-Order Correlations, Means, and Standard Deviations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. SPA T1	-														
2. SPA T2	.51***	-													
3. SPA T3	.36**	.85***	-												
4. POA T1	.26*	-.08	-.03	-											
5. POA T2	.13	.19	.25*	.47***	-										
6. POA T3	.03	.06	.22	.47***	.47***	-									
7. PF T1	.61***	.22	.03	.28*	.11	-.15	-								
8. PF T2	.35**	.48***	.37**	.14	.13	-.10	.70***	-							
9. PF T3	.16	.36***	.37**	.04	.21	.03	.50***	.74***	-						
10. M T1	.69***	.11	-.02	.34**	.13	-.04	.60***	.33**	.14	-					
11. M T2	.37***	.28*	.19	.19	.25*	-.03	.46***	.47***	.36**	.57***	-				
12. M T3	.19	.25*	.24*	.04	.15	-.04	.22	.36**	.44***	.47***	.65***	-			
13. PC T1	.73***	.24*	.11	.28	.01	-.04	.61***	.34**	.18	.65***	.21	.11	-		
14. PC T2	.48**	.59***	.47***	-.03	.11	-.10	.38***	.49***	.42***	.24*	.35**	.27*	.60***	-	
15. PC T3	.35**	.48***	.49***	-.02	.09	-.02	.26*	.42***	.45***	.23*	.31**	.32**	.53***	.83***	-
M	3.07	3.72	3.67	2.63	3.62	3.60	3.41	3.96	3.93	3.46	3.90	3.88	3.75	4.03	4.05
SD	0.82	0.58	0.65	1.43	1.27	1.26	1.01	0.62	0.57	0.87	0.60	0.58	0.75	0.59	0.53

Note. N = 72. T1 = Time 1. T2 = Time 2. T3 = Time 3. SPA = Self-perceptions of aging. POA = Perceptions of older adults. PF = Psychological flexibility. M = Mindfulness. PC = Perceived control. * $p < .05$. ** $p < .01$. *** $p < .001$.

Main Effects of Outcome Measures over Time

Results supported hypothesis 1; participants had reduced internalized ageism following the intervention and at a two month follow up. Repeated measures ANOVA revealed a significant within-subjects effect of time across outcome measures (See Table 3 and Figure 1). The effect sizes for the change in self-perceptions of aging (η_p^2 = 0.37, *F*(2, 142) = 41.23, *p* < .001) and perceptions of older adults (η_p^2 = 0.27, *F*(2, 140) = 25.89, *p* < .001) were very large. Results from post-hoc multiple comparisons supported the notion that internalized ageism decreased from T1 at T2 and remained stable thereafter (See Table 4). Participants reported significantly more positive self-perceptions of aging compared to T1 at T2 (*t*(71) = 7.55, *p* < .001) and T3 (*t*(71) = 5.99, *p* < .001). Participants also reported significantly more positive perceptions of older adults compared to time T1 at T2 (*t*(70) = 6.10, *p* < .001) and T3 (*t*(70) = 6.08, *p* < .001). T2 to T3 outcome scores did not differ and remained relatively constant (all *p*'s > .05; See Table 4).

Table 3

Repeated Measures ANOVA results.

Outcome	MSE	MS	F (df)	η_p^2
Self-Perceptions of Aging	0.23	9.51	41.23 (2, 142)***	0.37
Perceptions of Older Adults	0.95	24.53	25.89 (2, 140)***	0.27
Psychological Flexibility	0.25	7.25	29.29 (2, 142)***	0.29
Mindfulness	0.24	4.80	20.48 (2, 142)***	0.22
Perceived Control	0.16	2.16	13.93 (2, 142)***	0.16

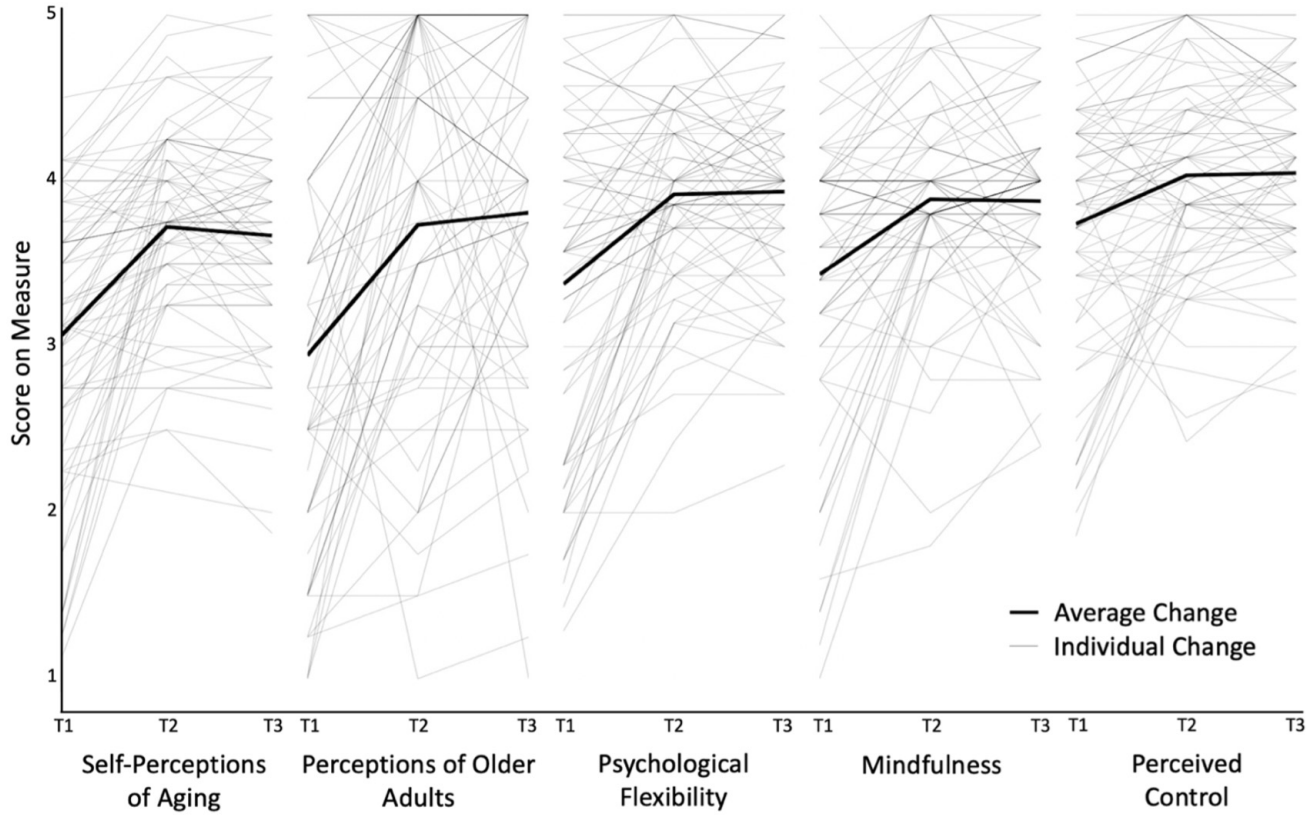
Note. *** *p* < .001. MSE = Mean square error. MS = Mean square**.** Effect size measured with partial eta squared (η_p^2); .01, .06, and .14 indicating small, medium, and large effects, respectively (Cohen, 1988)

Main Effects of Mediating Measures over Time

Results supported hypothesis two; mediating variables increased following the intervention and remain at this increased level at follow-up. Repeated measures ANOVA revealed significant within subject effects across all mediators (See Table 3 and Figure 1). Psychological flexibility,

Figure 1

Visual Representation of Average and Individual Change in Outcome and Mediating Measures Over Time



Note. T1 = Time 1 (baseline). T2 = Time 2 (immediately following intervention). T3 = Time 3 (two-month follow up). Repeated measures analysis revealed all changes are significant (see Results section). Post-hoc analyses revealed T1 scores on all measures significantly differed from the respective T2 and T3 measures, and T2 and T3 scores did not significantly differ across all measures.

(η_p^2 = 0.29, *F*(2, 142) = 29.29, *p* < .001), mindfulness (η_p^2 = 0.22, *F*(2, 142) = 20.48, *p* < .001), and perceived control (η_p^2 = 0.16, *F*(2, 142) = 13.93, *p* < .001) had large effect sizes. Post-hoc multiple comparison analysis revealed that these mediators increased from T1 at T2 and remained constant thereafter. Psychological flexibility increased from T1 to T2 (*t*(71) = 6.24, *p* < .001) and T1 to T3 (*t*(71) = 5.41, *p* < .001). Mindfulness increased from T1 to T2 (*t*(71) = 5.27, *p* < .001) and T1 to T3 (*t*(71) = 4.71, *p* < .001). Finally, perceived control increased from T1 to T2 (*t*(71) = 3.98, *p* < .001) and T1 to T3 (*t*(71) = 3.97 < .001). T2 and T3 measurements on all mediating variables did not differ from one another as there was very little change in scores (all *p*'s > .05; See Table 4).

Mediational Analysis of Process Variables

Mediation analyses supported hypothesis 3; changes in process-based variables mediated positive change in self-perceptions of aging and perceptions of older adults. To summarize, T1 levels of outcome variables negatively predicted change scores in the mediating variables. In turn, change scores in the mediating variables positively predicted T2 and T3 scores in outcome variables, respectively. In other words, those with more negative self-perceptions of aging and perceptions of older adults at baseline experienced greater change in the mediating variables. Those who experienced greater change in the mediating variables reported more positive self-perceptions of aging and perceptions of older adults at T1 and T3. See Tables 5-7 for model summaries of mediators run individually, and Table 8 for parallel mediation model summaries.

Table 4

Post Hoc Multiple Comparisons

Outcome	M	SE	95% CI	*t* (df)
Self-Perceptions of Aging				
Time 1 vs. Time 2	0.65	0.09	(0.48, 0.83)	7.55 (71)***
Time 1 vs. Time 3	0.60	0.10	(0.40, 0.80)	5.99 (71)***
Time 2 vs. Time 3	-0.05	0.04	(-0.13, 0.03)	-1.29 (71)
Perceptions of Older Adults				
Time 1 vs. Time 2	1.02	0.17	(0.69, 1.36)	6.10 (70)***
Time 1 vs. Time 3	1.01	0.17	(0.68, 1.35)	6.08 (70)***
Time 2 vs. Time 3	-0.01	0.16	(-0.32, 0.30)	-0.06 (70)
Psychological Flexibility				
Time 1 vs. Time 2	0.54	0.09	(0.37, 0.71)	6.24 (71)***
Time 1 vs. Time 3	0.56	0.10	(0.35, 0.76)	5.41 (71)***
Time 2 vs. Time 3	0.02	0.05	(-0.08, 0.12)	0.32 (71)
Mindfulness				
Time 1 vs. Time 2	0.45	0.09	(0.28, 0.62)	5.27 (71)***
Time 1 vs. Time 3	0.44	0.09	(0.25, 0.64)	4.71 (71)***
Time 2 vs. Time 3	-0.01	0.06	(-0.13, 0.10)	-0.19 (71)
Perceived Control				
Time 1 vs. Time 2	0.29	0.07	(0.15, 0.44)	3.98 (71)***
Time 1 vs. Time 3	0.31	0.08	(0.15, 0.46)	3.97 (71)***
Time 2 vs. Time 3	0.01	0.04	(-0.06, 0.09)	0.36 (71)

Note. M = Mean difference between time points. All differences are calculated such that the earlier time point is subtracted from the later time point and positive values represent an increase over time. All time 1 vs. time 2 contrasts are significant with Bonferroni adjustment (alpha = .002).

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

Table 5

Mediation Analysis of Change in Psychological Flexibility to Reduce Internalized Ageism

	Outcome							
	Change in PF (Time 1 to Time 2)				**Time 2 SPA**			
Predictor	**path**	**b**	**SE**	**95% CI**	**path**	**b**	**SE**	**95% CI**
Constant		2.050[a]	0.279	(1.483, 2.596)		1.680[a]	0.263	(1.175, 2.185)
Time 1 SPA	a	-0.488[a]	0.088	(-0.663, -0.313)	c'	0.584[a]	0.072	(0.440, 0.728)
Change in PF					b	0.462[a]	0.082	(0.299, 0.625)
Total Effect						0.359[a]	0.072	(0.215, 0.502)
Indirect Effect						-0.225[a]	0.057	(-0.342. -0.118)
Model R2		0.306, F(1, 70) = 30.929***				0.495, F(2, 69) = 33.836***		
	Change in PF (Time 1 to Time 3)				**Time 3 SPA**			
Predictor	**path**	**b**	**SE**	**95% CI**	**path**	**b**	**SE**	**95% CI**
Constant		2.538[a]	0.313	(1.914, 3.162)		1.464[a]	0.313	(0.841, 2.088)
Time 1 SPA	a	-0.646[a]	0.099	(-0.842, -0.449)	c'	0.624[a]	0.090	(0.445, 0.802)
Change in PF					b	0.525[a]	0.086	(0.354, 0.696)
Total Effect						0.284[a]	0.087	(0.111, 0.458)
Indirect Effect						-0.339[a]	0.076	(-0.491, -0.194)
Model R2		0.380, F(1, 70) = 42.970***				0.438, F(2, 69) = 26.902***		
	Change in PF (Time 1 to Time 2)				**Time 2 POA**			
Predictor	**path**	**b**	**SE**	**95% CI**	**path**	**b**	**SE**	**95% CI**
Constant		0.924[a]	0.177	(0.570, 1.277)		2.345[a]	0.335	(1.676, 3.015)
Time 1 POA	a	-0.147[a]	0.060	(-0.266, -0.028)	c'	0.449[a]	0.091	(0.250, 0.648)
Change in PF					b	0.209	0.193	(-0.177, 0.594)
Total Effect						0.419[a]	0.958	(0.228, 0.610)
Indirect Effect						-0.031	0.028	(-0.095, 0.015)
Model R2		0.081, F(1, 69) = 6.059*				0.230, F(2, 68) = 10.159***		
	Change in PF (Time 1 to Time 3)				**Time 2 POA**			
Predictor	**path**	**b**	**SE**	**95% CI**	**path**	**B**	**SE**	**95% CI**
Constant		1.034[a]	0.209	(0.616, 1.451)		2.017[a]	0.301	(1.416, 2.618)
Time 1 SPA	a	-0.183[a]	0.071	(-0.323, -0.042)	c'	0.504[a]	0.091	(0.322, 0.687)
Change in PF					b	0.516[a]	0.149	(0.219, 0.813)
Total Effect						0.410[a]	0.094	(0.223, 0.597)
Indirect Effect						-0.094[a]	0.046	(-0.204, -0.023)
Model R2		0.089, F(1, 69) = 6.731*				0.334, F(2, 68) = 17.070***		

Note. N = 72. SPA = Self-perceptions of aging. POA = Perceptions of older adults. PF = Psychological flexibility. Change in all mediating variables reflect their change from time one to the time point of the respective outcome variable.

[a] = Confidence interval does not cross zero.

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

Table 6

Mediation Analysis of Change in Mindfulness to Reduce Internalized Ageism

	Outcome							
	Change in MA (Time 1 to Time 2)				**Time 2 SPA**			
Predictor	**path**	**b**	**SE**	**95% CI**	**path**	**b**	**SE**	**95% CI**
Constant		1.903[a]	0.279	(1.347, 2.459)		1.820[a]	0.256	(1.310, 2.330)
Time 1 SPA	a	-0.473[a]	0.088	(-0.648, -0.298)	c'	0.558[a]	0.074	(0.410, 0.706)
Change in M					b	0.421[a]	0.085	(0.252, 0.591)
Total Effect						0.359[a]	0.072	(0.215, 0.503)
Indirect Effect						-0.199[a]	0.069	(-0.347, -0.075)
Model R2		0.293, F(1, 70) = 29.051***				0.456, F(2, 69) = 28.885***		
	Change in MA (Time 1 to Time 3)				**Time 3 SPA**			
Predictor	**path**	**b**	**SE**	**95% CI**	**path**	**b**	**SE**	**95% CI**
Constant		2.325[a]	0.277	(1.774, 2.877)		1.401[a]	0.316	(0.770, 2.032)
Time 1 SPA	a	-0.614[a]	0.087	(-0.787, -0.440)	c'	0.653[a]	0.092	(0.470, 0.836)
Change in M					b	0.601[a]	0.096	(0.408, 0.793)
Total Effect						0.284[a]	0.087	(0.111, 0.458)
Indirect Effect						-0.369[a]	0.083	(-0.533, -0.204)
Model R2		0.416, F(1, 70) = 49.790***				0.445, F(2, 69) = 27.610***		
	Change in MA (Time 1 to Time 2)				**Time 2 POA**			
Predictor	**path**	**b**	**SE**	**95% CI**	**path**	**b**	**SE**	**95% CI**
Constant		0.788[a]	0.177	(0.436, 1.141)		2.285[a]	0.319	(1.649, 2.921)
Time 1 POA	a	-0.130[a]	0.060	(-0.248, -0.011)	c'	0.460[a]	0.098	(0.265, 0.655)
Change in M					b	0.321	0.191	(-0.060, 0.703)
Total Effect						0.419[a]	0.096	(0.228, 0.610)
Indirect Effect						-0.042	0.031	(-0.114, 0.005)
Model R2		0.064, F(1, 69) = 4.738*				0.248, F(2, 68) = 11.216***		
	Change in MA (Time 1 to Time 3)				**Time 3 POA**			
Predictor	**path**	**b**	**SE**	**95% CI**	**path**	**b**	**SE**	**95% CI**
Constant		0.929[a]	0.187	(0.556, 1.303)		2.260[a]	0.320	(1.622, 2.899)
Time 1 POA	a	-0.189[a]	0.063	(-0.315, -0.063)	c'	0.469[a]	0.098	(0.273, 0.665)
Change in M					b	0.312	0.177	(-0.040, 0.664)
Total Effect						0.410[a]	0.094	(0.223, 0.597)
Indirect Effect						-0.059	0.040	(-0.150, 0.001)
Model R2		0.115, F(1, 69) = 8.992**				0.251, F(2, 68) = 11.402***		

Note. N = 72. SPA = Self-perceptions of aging. POA = Perceptions of older adults. PF = Psychological flexibility. Change in all mediating variables reflect their change from time one to the time point of the respective outcome variable.

[a] = Confidence interval does not cross zero.

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

Table 7

Mediation Analysis of Change in Perceived Control to Reduce Internalized Ageism

	Outcome							
	Change in PC (Time 1 to Time 2)				Time 2 SPA			
Predictor	**Path**	**b**	**SE**	**95% CI**	**Path**	**b**	**SE**	**95% CI**
Constant		1.263[a]	0.257	(0.751, 1.776)		1.911[a]	0.208	(1.497, 2.325)
Time 1 SPA	a	-0.316[a]	0.081	(-0.478, -0.155)	c'	0.537[a]	0.062	(0.413, 0.661)
Change in PC					b	0.563[a]	0.083	(0.397, 0.729)
Total Effect						0.359[a]	0.072	(0.215, 0.503)
Indirect Effect						-0.178[a]	0.063	(-0.305, -0.052)
Model R2		0.179, F(1, 70) = 15.305***				0.556, F(2, 69) = 43.161***		
	Change in PC (Time 1 to Time 3)				Time 3 SPA			
Predictor	**Path**	**b**	**SE**	**95% CI**	**Path**	**b**	**SE**	**95% CI**
Constant		1.642[a]	0.249	(1.146, 2.138)		1.685[a]	0.282	(1.123, 2.247)
Time 1 SPA	a	-0.435[a]	0.078	(-0.591, -0.279)	c'	0.579[a]	0.084	(0.413, 0.746)
Change in PC					b	0.678[a]	0.106	(0.466, 0.889)
Total Effect						0.284[a]	0.087	(0.111, 0.458)
Indirect Effect						-0.295[a]	0.067	(-0.421, -0.155)
Model R2		0.306, F(1, 70) = 30.885***				0.454, F(2, 69) = 28.677***		
	Change in PC (Time 1 to Time 2)				Time 2 POA			
Predictor	**Path**	**b**	**SE**	**95% CI**	**Path**	**b**	**SE**	**95% CI**
Constant		0.688[a]	0.146	(0.408, 0.990)		2.108[a]	0.314	(1.482, 2.734)
Time 1 POA	a	-0.157[a]	0.049	(-0.255, -0.059)	c'	0.515[a]	0.098	(0.319, 0.711)
Change in PC					b	0.615[a]	0.224	(0.167, 1.062)
Total Effect						0.419[a]	0.096	(0.227, 0.610)
Indirect Effect						-0.096[a]	0.059	(-0.239, -0.012)
Model R2		0.129, F(1, 69) = 10.178**				0.295, F(2, 68) = 14.214***		
	Change in PC (Time 1 to Time 3)				Time 3 POA			
Predictor	**Path**	**b**	**SE**	**95% CI**	**Path**	**b**	**SE**	**95% CI**
Constant		0.726[a]	0.154	(0.429, 1.043)		2.237[a]	0.315	(1.609, 2.865)
Time 1 POA	a	-0.164[a]	0.052	(-0.268, -0.060)	c'	0.48[a]	0.098	(0.284, 0.676)
Change in PC					b	0.426	0.213	(-0.000, 0.852)
Total Effect						0.410[a]	0.094	(0.223, 0.597)
Indirect Effect						-0.070[a]	0.042	(-0.170, -0.005)
Model R2		0.126, F(1, 69) = 9.981**				0.260, F(2, 68) = 11.945***		

Note. N = 72. SPA = Self-perceptions of aging. POA = Perceptions of older adults. PF = Psychological flexibility. Change in all mediating variables reflect their change from time one to the time point of the respective outcome variable.

[a] = Confidence interval does not cross zero.

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

Table 8

Mediation Analysis of Change in Outcome Variables – Parallel Mediation Models

	Mediation of Self-Perceptions of Aging Change					
	Time 2 SPA			**Time 3 SPA**		
	b	**SE**	**95% CI**	**b**	**SE**	**95% CI**
Constant	1.336[a]	0.244	(0.849, 1.823)	0.917[a]	0.298	(0.323, 1.510)
Total Effect of Model	0.359[a]	0.721	(0.215, 0.503)	0.284[a]	0.087	(0.111, 0.458)
Time One SPA Direct Effect	0.673[a]	0.068	(0.538, 0.809)	0.775[a]	0.085	(0.606, 0.944)
Total Indirect Effect	-0.315[a]	0.078	(-0.472, -0.167)	-0.492[a]	0.085	(-0.643, -0.310)
Change in PF Indirect Effect	-0.145[a]	0.042	(-0.236, -0.071)	-0.178[a]	0.062	(-0.299, -0.053)
Change in M Indirect Effect	-0.077	0.058	(-0.223, 0.006)	-0.184[a]	0.070	(-0.330, -0.057)
Change in PC Indirect Effect	-0.092[a]	0.045	(-0.189, -0.011)	-0.123	0.053	(-0.241, -0.032)
Model R2	0.640, F(4, 67) = 29.720***			0.589, F(4, 67) = 23.989***		
	Mediation of Perception of Older Adults Change					
	Time 2 POA			**Time 3 POA**		
	b	**SE**	**95% CI**	**b**	**SE**	**95% CI**
Constant	2.165[a]	0.337	(1.493, 2.838)	2.051[a]	0.316	(1.421, 2.682)
Total Effect of Model	0.419[a]	0.096	(0.228, 0.610)	0.410[a]	0.094	(0.223, 0.587)
Time One POA Direct Effect	0.512[a]	0.100	(0.313, 0.712)	0.496[a]	0.095	(0.305, 0.686)
Total Indirect Effect	-0.094[a]	0.061	(-0.236. -0.002)	-0.086	0.052	(-0.206, 0.000)
Change in PF Indirect Effect	0.013	0.036	(-0.044, 0.094)	-0.105[a]	0.055	(-0.227, -0.012)
Change in M Indirect Effect	0.014	0.038	(-0.044, 0.109)	0.019	0.043	(-0.070, 0.105)
Change in PC Indirect Effect	-0.120	0.094	(-0.352, 0.008)	0.001	0.057	(-0.136, 0.097)
Model R2	0.298, F(4, 66) = 7.010***			0.336, F(4, 66) = 9.981**		

Note. SPA = Self-perceptions of aging. POA = Perceptions of older adults. PF = Psychological flexibility. M = Mindfulness. PC = Perceived control. Change in all mediating variables reflect their change from time one to the time point of the respective outcome variable. All mediators in the above models run simultaneously. [a] = Confidence intervals do not cross zero. *** = $p < .001$.

Self-Perceptions of Aging

When considered individually, all process-based variables partially mediated the change in self-perceptions of aging. Change in psychological flexibility (see Table 5) had a significant indirect effect from T1 to T2 (*b* = -.23, 95% CI [-0.34, -0.12]) and T1 to T3 (*b* = -.34, 95% CI [-0.49, -0.19]). Change in mindfulness (See Table 6) had a significant indirect effect from T1 to T2 (*b* = -.20, 95% CI [-0.35, -0.08]) and T1 to T3 (*b* = -.37, 95% CI [-0.53, -0.20]). Change in perceived control (See Table 7) had a significant indirect effect from T1 to T2 (*b* = -.18, 95% CI [-0.31, -0.05]) and T1 to T 3 (*b* = -.23, 95% CI [-0.42, -0.16]). When all mediating variables were run as parallel mediators, not all maintained their significant indirect effect (See Table 8). For T1 to T2, the total indirect effect of all mediators was *b* = -0.32, 95% CI (-0.47, -0.17). The indirect effect of psychological flexibility (*b* = -.15, 95% CI [-0.24, -0.07]) and perceived control (*b* = -.09, 95% CI [-0.19, -0.01]) remained significant, and the indirect effect of mindfulness was nearly significant (*b* = -.08, 95% CI [-0.22, 0.01]). This model explained 64% of the variance in T2 self-perceptions of aging. For T1 to T3 change, the total indirect effect was *b* -0.49, 96% CI (-0.64, -3.10). The individual indirect effect of psychological flexibility (*b* = -.18, 95% CI [-0.30, -0.05]), mindfulness (*b* = -.18, 95% CI [-0.33, -0.06]) and perceived control (*b* = -.12, 95% CI [-0.24, -0.03]) were all significant. This model explained 59% of the variance in T3 self-perceptions of aging.

Perceptions of Older Adults

When run individually, psychological flexibility's indirect effect (See Table 5) was significant from T1 to T3 (*b* = -.09, 95% CI [-0.20, -0.02]), and nearly significant from T1 to T2 (*b* = -.03, 95% CI [-0.10, 0.01]). The indirect effect of mindfulness (See Table 6) was nearly significant across T1 to T2 (*b* = -.04, 95% CI [-0.11, 0.01]), and T1 to T3 (*b* = -.06, 95% CI [-0.15, 0.00]). The indirect effect of perceived control (See Table 7) was significant across T1 to T2 (*b* = -.10, 95% CI [-0.24, -0.01]) and T1 to T3 (*b* = -.07, 95% CI [-0.17, -0.01]). When all mediators were run simultaneously (See Table 8), the total indirect effect of all mediators was significant from time T1 to T2 (*b* = -.09, 95% CI [-0.24, -0.00]). However, no individual

mediators maintained a significant indirect effect. This model explained 30% of the variance in T2 perceptions of older adults. Conversely, from T1 to T3, the total indirect effect of all mediators was nearly significant (*b* = -.09, 95% CI [-.21, .00]). The indirect effect of psychological flexibility, however, was significant (*b* = -.10, 95% CI [-0.23, -0.01]). No other individual mediator had a significant indirect effect. This model explained 34% of the variance in T3 perceptions of older adults.

Discussion

To my knowledge, this is the first theory-based, longitudinal intervention aimed at decreasing internalized ageism. Results largely supported my hypotheses. Participants had substantially more positive self-perceptions of aging and more positive perceptions of older adults following the intervention. Furthermore, participants showed increases in the mechanisms purported to reduce ageism; psychological flexibility, mindfulness, and perceived control. All gains across outcomes and mediators were maintained at a two-month follow up. Finally, improvements in the process-based mediators were responsible for the reductions of internalized ageism. That the intervention resulted in significant change associated with large effect sizes is extremely promising, given the deleterious consequences of internalized ageism.

The pattern of mediation found across mediation effects was consistent. Across both outcome variables, when mediation was significant, the indirect effect was negative. These negative indirect effects represent the negative relationship between baseline levels of the outcome variables and change in the mediators. That is, at the start of the intervention, those who had more negative self-perceptions of aging and more negative perceptions of older adults to begin with, experienced more change in the mediators than those who came to the intervention with relatively positive views. This is likely due to positive relationships between baseline levels of the outcome variables and the mediating variables. Those who had more negative views of aging prior to the intervention had more room to change in terms of both mediators and outcomes. This increased change in mediating variables, in turn, predicted

more positive outcomes at T2 and T3. Thus, it may be that those with the most internalized ageism to begin with, as a function of the mediating variables, received the most benefit. This mediation effect is most likely the result of the empirical tools employed within the intervention.

Perceived control is a mechanism through which AR may have contributed to reductions of internalized ageism. Although impossible to know for certain that AR increased perceived control because it was embedded in an intervention that targeted multiple mechanisms, there are several studies that have demonstrated its efficacy in doing so (e.g., Haynes et al., 2009). Thus, this study adds to a growing body of literature demonstrating AR's beneficial effects among older adults (Murphy et al., 2022; Sarkisian et al., 2007). Furthermore, the current study extends AR's empirical benefits in older adults from increases in physical activity to internalized ageism through the mechanism of perceived control. It should be noted that the change in perceived control and its indirect mediation effect appeared weakest of the three mediator variables across analyses. This is reasonably expected since AR was a component of one session within this six-session intervention, while acceptance and commitment therapy that explicitly targets mindfulness and psychological flexibility was utilized throughout all six sessions.

ACT interventions targeted various mechanisms proposed by Steward (2022) along the psychological, behavioral, and physiological pathways through which SET posits internalized ageism negatively impacts health. Again, though impossible to ascertain whether ACT directly impacted psychological flexibility and mindfulness, a corpus of literature has shown it to be effective in doing so (Hayes et al., 2022). In a recent comprehensive review of the world's literature on mediating factors of therapeutic outcomes among randomized trials for mental health outcomes, psychological flexibility emerged as the most frequent significant mediator, and mindfulness followed it as the second most common (Hayes et al., 2022). Thus, the fact that these variables had relatively large mediating impacts on self-perceptions of aging, and that psychological flexibility was the sole mediator of sustained change

in perceptions of older adults, makes sense within the context of the broader psychological intervention literature. It should be noted that results from this study seemingly contradicts one study which found an ACT exercise had no impact on internalized ageism in older adults or college students (Lester & Murrell, 2022). However, that intervention included a brief 13-minute non-ageism-related exercise. It may be that, like many psychotherapeutic outcomes, the dose is related to the impact. It may also be that including various ACT exercises targeting multiple processes within a PBT framework is necessary to see impactful change. Finally, it may be that directly relating the exercises to internalized ageism, as was done in the current study, was responsible for change.

Results from this study also suggests that internalized ageism directed at the self, and in-group ageism from one older adult to another may be distinct constructs. Although both self-perceptions of aging and perceptions of older adults became significantly more positive after the intervention and remained improved at a two-month follow up with large effect sizes, baseline levels of these outcomes were weakly related to each other. Indeed, intercorrelations between these constructs ranged from .03 to .26 across the three time points. Furthermore, compared to the gains in perceptions of older adults, the increase in positive self-perceptions of aging was more consistently and frequently mediated by the process-based variables targeted by this intervention. This is reasonable given that these process-based variables are constructs that represent traits internal to the individual. Ergo, it follows that the change in the outcome measure that also reflects beliefs about the self would be more strongly mediated by such constructs. Thus, this study provides some evidence that (1) these constructs are only weakly related in a sample of community dwelling older adults at baseline and showed no significant correlation post-intervention and (2) the mechanisms which act on these constructs may differ. Often, perceptions of the self and of others in the context of aging are used interchangeably to represent internalized ageism in older adults (e.g., Levy, 2022; Steward, 2022; WHO, 2023), though the current findings call this assumption into question. Understanding differences in how an older adult who may have internalized

ageist messaging views themselves in the context of aging, and how they view others, may be an important direction of future research.

Finally, though the goal of this research was to evaluate the program's impact on internalized ageism, it may have benefits that extend well beyond this construct. The various mechanisms targeted by this intervention, elucidated by Steward (2022), have been demonstrated to mediate between internalized ageism and negative health outcomes (e.g., Chang et al., 2020; Kim et al., 2019; Levy et al., 2002; Steward & Hasche, 2022; Yeom, 2014). Indeed, participants reported behaviour change that suggests these mechanisms were effectively addressed (Murphy, 2023a). Thus, by addressing these mechanisms, the program may potentially protect against downstream consequences of internalized ageism, beyond the effect on internalized ageism itself. Future research should employ health outcome measures to test this assumption.

Strengths and Limitations

The current study's findings should be interpreted considering its strengths and limitations. Regarding its strengths, first, to my knowledge, this is the first theory-informed longitudinal intervention targeting internalized ageism. That effect sizes were so large is very promising given its novelty. Second, this intervention took a process-based approach and participants displayed practically significant change in psychological constructs demonstrated to mediate change in several therapeutic settings (Hayes et al., 2022). Identifying possible mechanisms of change expand the opportunities to successfully target and reduce internalized ageism. Third, there was very little attrition in this research, speaking to the ability of the intervention to promote engagement over a voluntary six-week period.

Despite the strengths, there are notable limitations as well. This mediational analysis is suggestive of possible mechanisms of action, but not causally conclusive. Without the presence of a control group, I cannot conclude the intervention was responsible for change. Regression toward the mean could explain why those with the most negative self-perceptions of aging and negative

perceptions of older adults experienced the greatest benefit. Again, a control group is necessary in future research to address this. Furthermore, to properly infer mediation one must establish a timeline in which the mediator changes before the outcome. To accomplish this one should measure change in the mediator before change in the outcome, and the outcome should also be measured earlier along with the mediator to establish that the mediator changed prior to the outcome (Berli et al., 2021; Kazdin, 2007). Additionally, the change in the outcome must still follow the change in the mediator in close enough succession to rule out extraneous variables. The present research included three time points of measurement that did not allow for such precision. Another notable limitation is the sample. The study was predominantly White, female, and highly educated. Furthermore, this intervention was delivered over Zoom which may have limited the sample to those with some comfort with this medium. These sample considerations limit the ability to generalize findings to a more diverse population of older adults. Still, this intervention was designed to be tailored to the individuals taking part in the program (Murphy, 2023a), and results should theoretically generalize across older adults.

Conclusion

In conclusion, this six-week process-based intervention grounded in SET and PBT designed to reduce internalized ageism appears to be a promising tool in reducing internalized ageism. At the very least, it suggests practically significant reductions in internalized ageism are feasible using empirically established tools. Given that internalized ageism has been found to predict negative health outcomes in cognitive, social, emotional, and physical domains, this is especially important. The ability to reduce the negative impact of internalized ageism on vulnerable older adults has the potential to positively impact the well-being of older adults across the globe. As the WHO (2021) points out, ageism is particularly insidious; its practices appear normal and avoid recognition due to these ageist rules, norms, and practices being so long-standing and ritualized. Though addressing this institutional, societal ageism is a

salient issue, it is undoubtedly a difficult task. In the interim, protecting older adults who may be most severely impacted by its negative consequences is a laudable goal that the current study helps address.

References

Beyer, A. K., Wolff, J. K., Freiberger, E., & Wurm, S. (2019). Are self-perceptions of ageing modifiable? Examination of an exercise programme with vs. without a self-perceptions of ageing-intervention for older adults. *Psychology and Health*, *34*(6), 661–676. https://doi.org/10.1080/08870446.2018.1556273

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire-II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy*, *42*(4), 676–688. https://doi.org/10.1016/J.BETH.2011.03.007

Burnes, D., Sheppard, C., Henderson, C. R., Wassel, M., Cope, R., Barber, C., & Pillemer, K. (2019). Interventions to reduce ageism against older adults: A systematic review and meta-analysis. In *American Journal of Public Health* (Vol. 109, Issue 8, pp. E1–E9). American Public Health Association Inc. https://doi.org/10.2105/AJPH.2019.305123

Cohen J. (1988). Statistical power analysis for the behavioral sciences. New York, NY: Routledge Academic

Chang, E. S., Kannoth, S., Levy, S., Wang, S. Y., Lee, J. E., & Levy, B. R. (2020). Global reach of ageism on older persons' health: A systematic review. *PLOS ONE*, *15*(1), e0220857. https://doi.org/10.1371/JOURNAL.PONE.0220857

Cheema, J. R. (2014). Some general guidelines for choosing missing data handling methods in educational research. *Journal of Modern Applied Statistical Methods*, *13*(2), 3. https://doi.org/10.22237/jmasm/1414814520

Chipperfield, J. G., Campbell, D. W., & Perry, R. P. (2004). Stability in perceived control: Implications for health among very old community-dwelling adults. *Journal of Aging and Health*, *16*(1), 116–147. https://doi.org/10.1177/0898264303260447

Falletta-Cowden, N., Smith, P., Hayes, S. C., Georgescu, S., & Kolahdouzan, S. A. (2022). What the body reveals about lay knowledge of psychological flexibility. *Journal of Clinical Medicine*, *11*(10). https://doi.org/10.3390/jcm11102848

Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd ed.). The Guildford Press.

Hayes, S. C., Ciarrochi, J., Hofmann, S. G., Chin, F., & Sahdra, B. (2022). Evolving an idionomic approach to processes of change: Towards a unified personalized science of human improvement. *Behaviour Research and Therapy*, *156*, 104155. https://doi.org/10.1016/J.BRAT.2022.104155

Haynes, T. L., Perry, R. P., Stupnisky, R. H., & Daniels, L. M. (2009). A review of AR treatments: Fostering engagement and persistence in vulnerable college students. In *Higher Education: Handbook of Theory and Research* (pp. 227–272). https://doi.org/10.1007/978-1-4020-9628-0_6

Hladkyj, S., Chipperfield, J. G., & Perry, R. P. (2000). *Successful aging study perceived control and health among older individuals: Variable creation and description.*

Hofmann, S. G., & Hayes, S. C. (2019). The future of intervention science: Process-based therapy. *Clinical Psychological Science*, *7*(1), 37–50. https://doi.org/10.1177/2167702618772296

Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology*, *3*, 1–27. https://doi.org/10.1146/ANNUREV.CLINPSY.3.022806.091432

Kim, H., Thyer, B. A., & Munn, J. C. (2019). The relationship between perceived ageism and depressive symptoms in later life: Understanding the mediating effects of self-perception of aging and purpose in life, using structural equation modeling. *Educational Gerontology*, *45*(2), 105–119. https://doi.org/10.1080/03601277.2019.1583403

Kleinspehn-Ammerlahn, A., Kotter-Grühn, D., & Smith, J. (2008). Self-perceptions of aging: Do subjective age and satisfaction with aging change during old age? *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, *63*(6). https://doi.org/10.1093/geronb/63.6.P377

Lester, E. G., & Murrell, A. R. (2022). An experimental study of mindfulness and acceptance-based skills for internalized ageism in older adults and college students. *Aging and Mental Health*, *26*(7), 1487–1494. https://doi.org/10.1080/13607863.2021.1950613

Levy, B. (2009). Stereotype embodiment: A psychosocial approach to aging. *Current Directions in Psychological Science*, *18*(6), 332–336. https://doi.org/10.1111/J.1467-8721.2009.01662.X

Levy, B., & Langer, E. (1994). Aging free from negative stereotype: successful memory in China and among the American deaf. *Journal of Personality and Social Psychology*, *66*(6), 989–997.

Levy, B. R., Slade, M. D., & Kasl, S. V. (2002). Longitudinal benefit of positive self-perceptions of aging on functional health. *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, *57*(5). https://doi.org/10.1093/geronb/57.5.P409

Murphy, D. J. (2023a). *Development and feasibility of a process based intervention to decrease internalized ageism.* [Unpublished master's thesis]. University of Manitoba.

Murphy, D. J., Chipperfield, J. G., Chuchmach, L. P., Perry, R. P., Parker, P. C., Hamm, J. M., & Dryden, R. (2022). Pilot test of the viability of an intervention to improve causal thinking and foster quality of life among older adults. *Centre on Aging Spring Symposium*.

Osman, A., Lamis, D. A., Bagge, C. L., Freedenthal, S., & Barnes, S. M. (2016). The mindful attention awareness scale: Further examination of dimensionality, reliability, and concurrent validity estimates. *Journal of Personality Assessment*, *98*(2), 189–199. https://doi.org/10.1080/00223891.2015.1095761

Sarkisian, C. A., Prohaska, T. R., Davis, C., & Weiner, B. (2007). Pilot test of an attribution retraining intervention to raise walking levels in sedentary older adults. *Journal of the American Geriatrics Society*, *55*(11), 1842–1846. https://doi.org/10.1111/J.1532-5415.2007.01427.X

Steward, A. (2022). Toward interventions to reduce internalized ageism. *Journal of Human Behaviour in the Social Environment*, *32*(3), 336–355. https://doi.org/10.1080/10911359.2021.1898516

Steward, A., & Hasche, L. (2022). Exploring lifestyle activities to reduce internalized ageism: Self-efficacy as a mediator between exercise, volunteering, computer use, and self-perceptions of aging. *International Journal of Aging and Human Development*, *94*(3), 255–272. https://doi.org/10.1177/00914150211024175

Wolff, J. K., Warner, L. M., Ziegelmann, J. P., & Wurm, S. (2014). What do targeting positive views on ageing add to a physical activity intervention in older adults? Results from a randomised controlled trial. *Psychology and Health*, *29*(8), 915–932. https://doi.org/10.1080/08870446.2014.896464

World Health Organization. (2015). *World report on ageing and health*. World Health Organization. https://apps.who.int/iris/handle/10665/186463

World Health Organization. (2021). *Global report on ageism*.

World Health Organization. (2023). *Ageism*. https://www.who.int/health-topics/ageism#tab=tab_1

Yeom, H. E. (2014). Association among ageing-related stereotypic beliefs, self-efficacy and health-promoting behaviors in elderly Korean adults. *Journal of Clinical Nursing*, *23*(9–10), 1365–1373. https://doi.org/10.1111/JOCN.1249