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Article title

Which interventions with youths counter ageism toward older adults? Results from a realist review

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Abstract

Age-related social biases – ageism – are developed at an early age. Interventions to counter ageism have been identified but little is known about their mechanisms, particularly in children. This study aimed to provide a comprehensive understanding of which interventions in youths are most effective, under which circumstances, how, and with what outcomes. Using 46 keywords in 6 databases, a realist review identified 24 studies published between 2000 and 2021 targeting youths under 18. A content analysis of these studies led to the construction of a Context-Mechanisms-Outcomes explanatory model. Contextual facilitators triggering mechanisms for changing stereotypes, prejudices and discrimination were: 1) enhancing knowledge about aging and older adults by providing nuanced information, 2) improving the quality of intergenerational contacts, 3) increasing opportunities to apply previously acquired knowledge in intergenerational interactions, and 4) promoting reflective thinking about experiences with older adults. However, stereotypes and prejudices appeared to be resistant and changes difficult to generalize. Insufficiently advanced cognitive development in children or viewing healthy and socially engaged older adults as unrepresentative of their age group were obstacles that reduced intervention effectiveness. Future studies should explore how advancing age influences interventions as well as the characteristics of older adults involved.

Keywords

Adolescent; Ageism; Child; Education; Explanatory model; Intergenerational relations; Older adults; Review

Introduction

With population aging accelerating worldwide (United Nations, 2021), ensuring that older adults' rights are respected and their health and social participation optimized poses a major challenge. For many older adults, ageist prejudices restrict social participation, which increases loneliness (Ayalon & Tesch-Römer, 2018) and isolation (Fakoya et al., 2020). Ageism is defined as *stereotypes* (thoughts), *prejudices* (feelings) and *discrimination* (actions or behaviors) based on perceived age (World Health Organization, 2021a, 2021b). *Stereotypes* are cognitive representations resulting from overgeneralization of an age group's characteristics and guiding behaviors. Transmitted through socialization, learning processes, media discourses, etc. (Bigler & Liben, 2007; Nahon-Serfaty et al., 2013), stereotypes are based on beliefs and expectations about the characteristics of typical members of a group, such as that older adults are frail, rigid and depressed (Dovidio & Jones, 2019; World Health Organization, 2021b). *Prejudices* also guide actions and relate to emotional reactions or feelings like sympathy, pity, or aversion toward members of a group, which can be based on perceived age (Dovidio & Jones, 2019; World Health Organization, 2021b). *Discrimination* relates to actions, practices or policies applied to people based on their perceived group membership, such as behaving differently towards a particular age group (Dovidio & Jones, 2019; World Health Organization, 2021b). Although it can target every group, ageism appears to be more frequent towards older adults (Burnes et al., 2019), which is the focus of this article. The COVID-19 pandemic also exacerbated this widespread phenomenon (Lichtenstein, 2021). Negative representations of aging and older adults can have serious harmful consequences, such as reduced life expectancy (Levy et al., 2002) or decreased health (Armstrong et al., 2017; Nelson, 2016).

In a youth-oriented society, age-related stereotypes and prejudices are learned from an early age (Bigler & Liben, 2007; Flamion et al., 2020; Mendonça et al., 2018; World Health Organization, 2021b). These negative biases make young people anxious about their own aging experience (Ayalon & Tesch-Römer, 2018; Drury et al., 2017). According to the terror management theory (Ayalon & Tesch-Römer, 2018; Greenberg et al., 1986), the fear of decline and death prompted by interactions with older adults leads to negative reactions toward, and avoidance of, the latter. Furthermore, with shifting demographics and changes in family structures, the distance established between generations increases, which limits intergenerational contacts (Drury et al., 2017; World Health Organization, 2021b). Ageist stereotypes are developed and learned during childhood, most often under the influence of parents and the media (Bigler & Liben, 2007; Mendonça et al., 2018). If not challenged, age-based stereotypes remain as people grow older, and can result in ageist attitudes and behaviors, including towards oneself (Lagacé & Firzly, 2017; Mendonça et al., 2018). Given the growing proportion of older adults and the negative consequences of ageism, it is essential to take a preventive approach to change the way aging is perceived, especially by younger people, and to establish a society free of ageism.

To this end, three types of intervention were identified, namely *education*, *intergenerational contacts* and a *combination of the two* (Burnes et al., 2019; World Health Organization, 2021b). Interventions using *education* are based on the hypothesis that limited knowledge about the aging process leads to the development of prejudice and belief in stereotypes. To overcome ignorance, misconceptions and simplistic thinking, educational interventions aim to provide accurate information presenting a realistic view of aging and highlighting the heterogeneity of the older adult population (Ayalon & Tesch-Römer, 2018; Burnes et al., 2019; Chonody, 2015). These interventions enable youths to identify and deconstruct their stereotypes and prejudices through

self-reflection and discussion. Learning about the similarities (in addition to differences) between generations also seems to foster positive intergenerational perceptions (World Health Organization, 2021b). Interventions using *intergenerational contacts* focus on building and facilitating relationships between generations (Burnes et al., 2019; World Health Organization, 2021b). Contacts can be direct or indirect (e.g., imagined or through others' experiences) and occur in various contexts (Christian et al., 2014; Drury et al., 2017). By enabling younger generations to get to know some older adults, these intergenerational contacts often help to deconstruct stereotypes, decrease anxiety about interacting with older adults and facilitate mutual understanding (Drury et al., 2017; World Health Organization, 2021b). According to the intergroup contact theory (Allport, 1954; Pettigrew & Tropp, 2006), a greater reduction of prejudices is triggered when optimal conditions are present, i.e., groups have equal status, work on a common goal and cooperate with each other while authority figures promote interactions. Other studies documented additional conditions that facilitate the reduction of prejudices, such as fostering close bonds and self-disclosure with one-on-one relationships (Christian et al., 2014; Drury et al., 2017). Finally, *combined interventions*, i.e., education and intergenerational contacts, seem to be slightly more effective than intergenerational contacts-only interventions in changing stereotypes and prejudices (Burnes et al., 2019; World Health Organization, 2021b) but might differ according to context. Knowledge about the aging process and older adults can be applied through intergenerational interactions.

A number of reviews related to interventions that counter ageism have been carried out (Burnes et al., 2019; Chonody, 2015; Christian et al., 2014; Drury et al., 2017; Jarrott et al., 2021; Martínez-Arnau et al., 2022) but few concern children (Gualano et al., 2018). Also, none of them specifically targeted all three types of intervention to counter ageism in individuals less than 18 years old

(called ‘youths’ henceforth in this study) to determine whether these interventions are equally effective in this population. For example, these interventions involve different educational strategies or intergenerational activities and, when combined, are less effective with pre-primary and primary school-aged children than with high school and university students, which reinforces the relevance of studying interventions specifically targeting youth (World Health Organization, 2021b). Moreover, although a few studies specifically documented how changes in ageism occur (Christian et al., 2014; Lineweaver et al., 2017; Teater, 2018), none provided an in-depth understanding of the contexts, mechanisms and outcomes of these interventions. Hence, the current study aimed to fill these gaps by providing a comprehensive understanding of the most efficient interventions to counter ageism in youths, under which circumstances, how, and with what outcomes.

Methods

To achieve this objective, a realist review was conducted (Pawson et al., 2005; Wong et al., 2016). As a theory-driven interpretative method, a realist review guides the development of explanatory models to get a better understanding of the mechanisms underlying complex interventions. This understanding is fostered by identifying three main intervention components. The *context* (C) involves the characteristics of the conditions in which interventions are used. Triggered by components of the context, the *mechanisms* (M) can make an intervention successful. The *outcomes* (O) produced by the mechanisms reflect both intended and unintended intervention effects (Pawson et al., 2005; Wong et al., 2016). Conducting a realist review consists of linking intervention components to develop C-M-O configurations, i.e., identify the contextual influences that triggered the mechanisms that generated the outcomes (Pawson et al., 2005; Wong et al.,

2016). Following the ‘Realist and meta-narrative evidence syntheses: Evolving standards’ (RAMESES), five key steps were carried out (Wong et al., 2016).

Clarifying the scope of the realist review

Iterative consulting sessions with the research team generated the following research question: What interventions to counter ageism among youths generate outcomes (O) on stereotypes, prejudices and discrimination, to what extent or under which circumstances (C), how and why (M)? Based on previous studies (Ayalon & Tesch-Römer, 2018; Burnes et al., 2019), three intervention types, i.e., education, intergenerational contacts and the two combined, were targeted.

Searching for evidence

As it covered the widest range of studies in terms of interventions and targeted populations, the study of Burnes et al. (2019) was the starting point of the search for evidence. Guided by the goals of a realist review and validated by two co-authors (ML, AC), Burnes and colleagues’ review (2019) was updated to November 11, 2022, and more extensive selection criteria were applied (e.g., qualitative and quantitative studies) across six electronic databases (Abstracts in Social Gerontology, AgeLine, CINAHL, MEDLINE, PsycInfo, SocINDEX). The same keywords selected by Burnes et al. (2019) were used, with the addition of keywords to identify studies documenting concrete actions (Table 1). To complete the search for evidence, the Scientific Watch of the Research Chair on Mistreatment of Older Adults was screened, and a manual search was carried out in references of reviews and selected texts.

[Insert Table 1 about here]

Selection of primary studies and extraction of data

The following inclusion criteria were used for this study. Selection was restricted to peer-reviewed journal articles, book chapters and doctoral dissertations. The selected documents had to: report the outcomes of interventions on at least one of the three components of ageism (stereotypes, prejudices, discrimination) and have been published in English or French between January 2000 and December 2022. Studies were excluded if the older adults involved in intergenerational contacts were below age 65 or had a specific physical or mental condition or if the study focused on intergenerational family ties. After removing duplicates, titles and abstracts of the remaining studies were screened (Figure 1). Two independent reviewers (AMG, CB) screened a sample of 144 studies (14.2% of 1012 studies, a sub-group excluding records unrelated to ageism or in an excluded format, i.e., erratum, commentary or editorial) and reached complete agreement. The remaining studies were screened (CB) using the same criteria. Full-text studies were then considered by three independent reviewers (JFC, LT, CB) to confirm their selection. Only studies targeting individuals under age 18 were retained for this review.

[Insert Figure 1 about here]

Data extraction was standardized with the use of a detailed explanatory manual created by three co-authors (AC, ML, CB). One reviewer (JFC, CB or LT) extracted data while another verified them. Extractions and coding decisions were discussed until interrater agreement was reached. Content extracted identified contextual characteristics, mechanisms (as explained by the authors of the studies) and outcomes involving the components of ageism (Table 2).

Analyzing and synthesizing evidence

Following the data extraction, an in-depth analysis to develop C-M-O configurations was conducted by three co-authors (ML, AC, CB) who considered each of the three types of intervention. Consistent with the realist review method (Wong et al., 2016), a synthesis of how

contextual specificities could have triggered the mechanisms that counter ageism was also prepared, leading to the construction of an explanatory model.

Formulating recommendations and conclusions

The synthesized evidence was used to formulate recommendations for effective use of the three types of intervention to counter ageism in youths. The contexts (i.e., characteristics of the interventions, including content and organization) most conducive to triggering mechanisms that lead to a decrease in stereotypes, prejudices and discrimination in the target population are described below.

Results

Twenty-four studies targeting participants under 18 years of age were selected (Figure 1). All were published between 2000 and 2021, with the majority after 2010 (n=17; 70.8%; Table 2). About half of the studies (n=11; 45.9%) were conducted in the US, and the others in Europe (n=6; 25%), Asia (n=5; 20.8%) and Australia (n=2; 8.3%). Half the interventions used intergenerational contacts (n=12; 50%), with experimental sample sizes between 7 and 40 participants aged 4 to 17 (Table 2). Nine studies (37.5%) focusing on interventions combining education and intergenerational contacts had 22 to 97 participants aged 8 to 17. Only three studies (12.5%) documented the effect of educational interventions only, with sample sizes between 31 and 782 participants aged 11 to 15 (Table 2).

[Insert Table 2 about here]

Ten studies (41.7%) had a quasi-experimental design and six (25%) a pre-experimental design; some also included a descriptive design (Table 2). Only three studies (12.5%) were randomized

controlled trials and five (20.8%) used only a descriptive design. Six studies (25%) evaluated all three outcomes, i.e., stereotypes, prejudices and discrimination (Table 2). Seven studies (29.2%) assessed two outcomes, and only one outcome was assessed in almost half of the studies (n=11; 45.8%). Ten studies (41.7%) showed significant improvements for all outcomes, two (8.3%) found significant improvements for some outcomes and a trend of improvement for others, and six (25%) a trend of improvement for all outcomes. Two studies (8.3%) reported no change and four (16.7%) showed mixed results, including one study with both significant improvements and a significant worsening of outcomes.

Educational interventions

Two educational interventions (Lichtenstein et al., 2001; Mellor et al., 2015) focused on the school context and employed different strategies, such as lectures on aging, health promotion and interpersonal respect, discussions on what it means to be an older adult or on ageist attitudes and stereotypes as well as role playing and games to develop new skills. By providing realistic and accurate information, these strategies triggered mechanisms for change by making children aware of the diversity among older adults with an understanding of life span and the impact of aging on health (Figure 2). Youths thus acquired a less biased view of the aging process and older adults' characteristics and developed a greater awareness of older people's concerns. For example, Lichtenstein et al. (2001) inserted some geriatrics and gerontology content in the mathematics and science curriculum, including 12 sessions over 36 weeks, to reduce age-related stereotypes (Table 2). The authors observed that key lessons (e.g., practical exercises) tended to reduce stereotypes, which resulted in an improvement in children's drawings of "typical" older adults. Developing social skills and fostering respect for older adults also facilitated positive changes (Figure 2), as shown by Mellor et al. (2015) who evaluated a 4-session multimodal educational program. By

examining the role of older adults in society, stereotypes, and the development of mutual respect and interpersonal skills (Table 2), the authors found a significant decrease in youths' prejudice following this program, and this was still present at the 6-month follow-up (Mellor et al., 2015).

[Insert Figure 2 about here]

In three studies, Chen et al. (2021) used counter-stereotypes cognitive training with one or more evaluative conditioning tasks to change implicit negative age-related attitudes (Table 2). By repeatedly associating positive words with older adults and seeing a video developing a counter-stereotype story, the 12- to 13-year-old adolescents significantly changed their stereotypes and prejudices. According to Chen et al. (2021), these tasks were effective in reducing the activation of ageist stereotypes, especially with adolescents with high cognitive plasticity (Figure 2). This effect was also maintained for a longer period by increasing the number of training tasks.

Intergenerational contact interventions

Intergenerational contact interventions used various activities, including storytelling, mentoring and leisure activities (Figure 2). Some conditions under which the contacts took place were important to trigger changes. For example, Alcock et al. (2011) set up a 28-week photovoice program that comprised cooperative group activities and written exchanges between the generations (Table 2). Equal status, common goal and cooperation in the task were established by the fact that the photography activity was chosen by all participants, although both generations lacked experience in this activity. According to Alcock et al. (2011), the decrease in all stereotypes, prejudices and discrimination is explained by the interaction conditions and having photography as an ice-breaking activity. Youths were able to challenge their stereotypes and prejudices, increase their awareness of similarities between the generations (by observing older adults' actions), see older adults as unique individuals, include them in activities, and foster the generalization of a

more realistic representation of older adults (Figure 2). Similarly, Kleijberg et al. (2020) observed that reciprocal interactions between 9-year-old youths and older adults involving arts activities related to end-of-life were efficient in decreasing stereotypes and prejudices. Youths were able to see older adults as individuals with their own experiences of life, regardless of the age group to which they belonged (Table 2).

Other conditions linked to intergenerational contacts, such as structured, mutually rewarding activities and enjoyable contacts that fostered intimacy with a low level of anxiety, triggered the mechanisms (Figure 2). Belgrave (2011) used a 12-week music therapy program in a retirement living facility with 14 older adults and 12 youths that included various activities (e.g., singing, discussions, instrument playing) in groups or dyads. After this intervention, a significant decrease in discrimination toward older adults and a downward trend in stereotypes were observed (Table 2). According to Belgrave (2011), activities in pairs fostered more intimacy and enabled youths to gradually overcome their stereotypes and get to know older adults and the value they have. After a 10-week summer program in a long-term care facility with dyadic interactions, Feyh et al. (2022) also observed an expansion of youths' internal perceptions of older adults they met (Table 2). This positive outcome was explained by the variety of activities (games, presentations, music, crafts, etc.) which increased attention and interest and by the supervision supporting communication and social interactions (Feyh et al., 2022) (Figure 2). Three studies (Belgrave, 2011; Cummings et al., 2004; Teater, 2018) noted that contacts in dyads or small groups encouraged self-disclosure between participants during activities, which facilitated positive outcomes (Figure 2). A significant decrease in stereotypical attitudes toward older adults was thus observed following positive paired mentoring interactions for 4 weeks, enabling youths to appreciate older adults' potential contribution, such as in supportive relationships or mutual learning (Cummings et al., 2004).

The profiles of older adults played a role in triggering the mechanisms (Figure 2). For example, Santini et al. (2018) used a 32-week intervention with various activities in small groups (e.g., learning sessions, biographical self-narration), allowing youths to interact with both active and more frail older adults (Table 2). By fostering awareness of older adults' heterogeneity, this intervention resulted in a decrease in stereotypes, prejudices and discrimination shown by youths. Similarly, using a pre-experimental design, Carcavilla et al. (2020) evaluated an online Spanish teaching program with videoconferencing in dyads. The results showed a decrease in prejudices, which the authors explained by the choice of activity, noting that older adults' health was not an obstacle to their participation in the program. In another study, Heyman et al. (2011) observed fewer stereotypes of older adults held by preschool children enrolled in a shared-site intergenerational program, i.e., a single site where different generations receive services, such as a children's daycare program and an adult day program (Table 2). These authors concluded that with early, positive exposure to older adults with physical and cognitive limitations, children learned to see the strengths beyond these limitations (Figure 2).

However, the effectiveness of intergenerational contact interventions was not established in every case (Figure 2). For example, with a 6-week puppet show activity, Pinguart et al. (2000) observed a significant decrease in stereotypes for both the experimental group (joint activities for younger and older individuals) and comparison group (only visual contact between youths and older adults; Table 2). This decrease in stereotypes was still present at the 7-week follow-up for the experimental group but had disappeared in the comparison group. According to these authors, the intervention's mechanisms were mitigated because stereotypes are highly resistant to change. Moreover, participants could have had less positive intergenerational contacts outside the

intervention program, leading them to consider older adults in the interaction group as a positive exception to the rule, which hindered the generalization of changes in stereotyping.

Combined interventions

Promoting reflective and critical thinking (e.g., peer discussions, journal writing) and fostering the application of previously acquired knowledge in intergenerational contacts were identified as facilitators triggering mechanisms for change (Figure 2). For example, in their program, Schwalbach and Kiernan (2002) included opportunities to apply information learned in pre-visit lessons (i.e., guest speakers, role playing, communication skills) when making friendly visits to older adults, followed by time for reflection and discussion about the feelings they experienced during the activity (Table 2). Although less discrimination was observed, mixed outcomes related to prejudices were found, where the latter was explained by the development of a realistic view of aging through education and significant relationships with older adults (Figure 2). According to Schwalbach and Kiernan (2002), some of the 9- to 10-year-old participants may not yet have acquired sufficient skills for abstract thinking and generalized learning, which impeded the triggering of mechanisms. Lynott and Merola (2007) used a 21-week intervention that included a pre-collaborative meeting with the young participants to give them information about aging and older adults (e.g., historical events, stereotypes, skills for interviewing older adults) followed by intergenerational interactions around leisure, storytelling, social visits and writing (Table 2). Youths exhibited a significant decrease in stereotypes for 9 of the 17 items, on the one hand seeing older adults as active and interesting despite their physical aspects and limitations and, on the other hand, improving their understanding and appreciation of older adults they met (Figure 2). Lynott and Merola (2007) also explained their results by setting up conditions for their intervention, i.e., equal status contact, common goals, cooperative interaction and institutional support. With their

intergenerational program, Sun et al. (2019) proposed a 6-week intervention that met the same conditions for quality intergenerational interactions, including opportunities for peer discussions about experiences with older adults (Table 2). A significant decrease in prejudices was explained by the high quality of intergenerational interactions, which increased the young participants' comfort level and provided them with positive views of older adults (Figure 2). At the end of the intervention, youths paid more visual attention to, and made more conversation with, older adults, which confirmed a decrease in discrimination related to these behaviors.

Despite the potential for change with the combined interventions, some contextual elements did not trigger the mechanisms. For example, two studies (Babcock et al., 2016, 2018) explored interventions of 4 and 6 weeks respectively, including storytelling, interviews and leisure activities, but did not report any changes in stereotypes and prejudices (Table 2). According to these authors, ageist biases might have already been ingrained in the young participants' minds and the interventions may have been too brief. Moreover, the healthy and socially engaged older adults they met may not have reflected youths' view of aging (Figure 2). Observing no effect of their program on prejudices (Table 2), Klein et al. (2005) also concluded that it was extremely difficult to change age-related prejudices in middle or high school, especially with only a one-day intervention (Figure 2).

Discussion

The aim of this study was to provide a comprehensive understanding of the types of intervention that are most effective in countering youths' ageism toward older adults, under which circumstances, how, and with what outcomes, i.e., using C-M-O configurations. Consistent with previous systematic reviews (Burnes et al., 2019; Chonody, 2015; Martínez-Arnau et al., 2022),

this study confirmed that the provision of nuanced information about aging and older adults helped youths avoid or deconstruct stereotypes. It also showed that educational interventions transformed their perceptions into positive and realistic opinions, increasing their compassion for older people's needs and concerns, as demonstrated by Lichtenstein and colleagues (2001). This review also found that educational programs fostering the development of social skills in order to interact with older adults played an important role in decreasing prejudices (Mellor et al., 2015).

According to the results of many intergenerational contact interventions identified in this review, bringing together different age groups can decrease ageism. With empirical confirmation of the intergroup contact theory (Allport, 1954; Pettigrew & Tropp, 2006), certain conditions (e.g., equal status of participants, cooperation in common goals, institutional support) help to decrease stereotypes and prejudices in ageist situations (Alcock et al., 2011; Kleijberg et al., 2020; Lynott & Merola, 2007; Sun et al., 2019). When reducing these biases, quality is more important than quantity of contacts (Hannon & Gueldner, 2008; Teater, 2018). This review also confirmed that positive changes were fostered by structured, mutually rewarding, close contacts without anxiety, as previously identified (Christian et al., 2014; Drury et al., 2017). It highlighted the mechanisms triggered by these contacts, i.e., questioning stereotypes and prejudices by getting to know older adults and identifying similarities between generations (Alcock et al., 2011; Cummings et al., 2004; Feyh et al., 2022; Kleijberg et al., 2020; Santini et al., 2018; Teater, 2018). Dissipating intergenerational anxiety with close contacts (e.g., dyadic interactions) and realistically seeing older adults as individuals also positively changed age-related biases that influence actions (Belgrave, 2011; Feyh et al., 2022; Kleijberg et al., 2020). When meeting older adults with diverse profiles, youths observed that their partners' health limitations were not an obstacle to doing

activities (Carcavilla et al., 2020; Heyman et al., 2011; Santini et al., 2018), which challenged their stereotypes and prejudices.

Fostering the development of critical and reflective thinking and providing opportunities to apply new knowledge are other contextual elements highlighted in this review that trigger positive changes with combined interventions. According to intergenerational program theories, decreases in prejudice are achieved through interactions with others and greater knowledge of these age-related emotional reactions or feelings (Schwalbach & Kiernan, 2002). If combined interventions to counter ageism are assumed to be the most effective (Burnes et al., 2019; Chonody, 2015), the results of this study indicate the need for nuances. Half of the outcomes (n=8; 50%) did not change, or only partially changed, following combined interventions with youths. Consistent with the WHO's conclusions (World Health Organization, 2021b), these types of interventions might be less effective with pre-primary and primary school-aged children.

Obstacles to change were also identified. For example, some studies highlighted difficulties in modifying older children's stereotypes and prejudices as these biases were already too ingrained to change with a brief intervention (Babcock et al., 2016, 2018; Klein et al., 2005; Pinquart et al., 2000). On the other hand, Chen et al. (2021) observed that 12- and 13-year-old youths have high cognitive plasticity, which enables them to change their stereotypes and prejudices. Schwalbach and Kiernan (2002) argued that because not all participants aged 9 or 10 had acquired the abilities to think abstractly and to generalize, they could not apply the new knowledge from their educational and intergenerational activities to all older adults. The present realist review also found that the representativeness of older adults participating in intergenerational activities could influence the triggering of change mechanisms. In other words, youths could view healthy, socially engaged older adults, referred to as "heroes" in Klein and colleagues' (2005) study, as positive

exceptions when interacting with them (Babcock et al., 2016; Pinquart et al., 2000), which triggered no effect on their age-related bias. The mixed results that emerged from the studies reviewed suggest the need for further research to gain a better understanding of the influence of advancing age on the effectiveness of interventions and the characteristics of older adults involved in the intergenerational contacts.

Recommendations

Given these findings, recommendations can be made regarding interventions to counter ageism in youths. Regardless of their type, interventions must increase youths' awareness of the heterogeneity of aging and highlight older adults' value, contributions and strengths. Stereotypes and prejudices can and must be challenged in order to generate a more realistic and positive perception of older adults and reduce discrimination toward them. Using intergenerational contacts requires in-depth planning of the conditions for these interventions. Contact quality is essential to generate positive outcomes, e.g., equality of status, cooperation in common goals, fostering intimacy and comfort with dyads or small group interactions. In this context, youths can see beyond older adults' limitations and really get to know them, which diminishes their stereotypes and prejudices. To move forward in reducing ageism, it is important to provide youths with opportunities and support for reflection and development of critical thinking. Finally, although it is advisable to intervene at an early age, it is necessary to consider the children's cognitive development when designing these actions, knowing that youths may not yet have acquired the skills required for reflection and generalization to take full advantage of them.

This realist review was carried out according to RAMESES standards (Wong et al., 2016) and using the research team's combined expertise. Among its limitations, it was sometimes difficult to clearly identify the contexts and mechanisms that explain the outcomes. Validation of the data

extraction by a second person and discussions about the selected codes improved the process. Regarding the studies selected, including only studies involving older adults (65 and older) in relatively good health during the intergenerational contacts probably influenced the results. If meeting healthy older adults challenged stereotypes and prejudices, some studies observed other outcomes, as these healthy older adults could be seen as exceptions. Further research should explore whether C-M-O configurations are similar when youths meet older adults with more limitations, although this risks confirming stereotypes and prejudices. Finally, although they were identified, cultural contexts were not analyzed in the various studies in connection with the interventions and their outcomes. The perception of aging and prejudices toward older people are strongly linked to culture and social interpretations (Levasseur et al., 2009). Therefore, changing these perceptions requires interventions adapted to the cultural contexts in which they take place.

Conclusion

This realist review provided a comprehensive understanding of which interventions with youths to counter ageism toward older adults were effective and how this happened. An integrative figure of the proposed C-M-O configurations documented how three types of interventions, namely education, intergenerational contacts and the two combined, transformed stereotypes, prejudices and discrimination. This contribution can help educational institutions, recreational associations and other organizations to bring generations closer together and counter ageism. Given the heterogeneity of the population considered in this review, future studies should explore whether the most promising interventions work differently depending on age, i.e., with children in pre-school, primary or secondary school. Finally, as only three studies did follow-ups over 6-month (Mellor et al., 2015), 7-week (Pinquart et al., 2000) and 6-day (Chen et al., 2021) periods, future

research should assess the effectiveness of lengthier interventions, especially since children mature faster than any other population group. Ageism is a widespread phenomenon which must be eradicated from society in order to integrate and respect the rights of all age groups. As the characteristics of the society in which people live influence their level of ageism (World Health Organization, 2021b), it would be useful to develop larger scale interventions targeting the entire population.

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The authors report there are no competing interests to declare.

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Table 1. Search strategy

ID	Concepts	Relevant key words
1	Ageism	Ageism, agism, ageist, agist, age discrimination, age prejudice, age stereotype, self-perceptions of ageing, self-perceptions of aging, self-perception of aging, age identity
2	Older adults	Aged, aging, ageing, old age, frail elderly, elder*, seniors, older adult, older adults, older person, older persons, older peoples, older people
3	Discrimination	Social exclusion, social rejection, social acceptance, stereotyped behavior, social perception, age identification, self-perception, prejudice, stereotyp*, stereotyping, social discrimination, intergenerational relations
4	Intervention [†]	Education, age education, aging education, action, actions, prevention, intervention, interventions, campaign, intergenerational

(#1 OR (#2 AND #3)) AND #4

[†] Addition to the search strategy of Burnes and colleagues (2019)

Table 2. Characteristics of the 24 studies included in the realist review, by type of intervention

Authors (year of publication) Country	Study design	Context Participants#	Context Intervention†	Mechanisms‡	Outcomes	
Education						
Chen et al. (2021) China	RCT	Study 1	Effect of training task			
		31 YG	1 day (1 session)	Counter-stereotypes transmitted with evaluative conditioning technique: ↓ aging stereotypes (modifying implicit attitudes toward OA); 12-13 years old: high cognitive plasticity	↓* S	
		12-13, Ø	School	EDU training task: evaluative conditioned reflex technology (positive + negative words attributed to OA or YG)	Poor retention effect (decline after 24 hours)	↓* P
			Study 2a	Effect of accumulating training tasks		
			34 YG	1 day (1 session)	Same as Study 1 + ↑ retention effect (after 72 hours); ↑ effect using the counter-stereotypes scenario story method	↓* S
			12-13, Ø	School		↓* P
			No OA	EDU dual training tasks: evaluative conditioned reflex technology + video viewing task (counter-stereotypes situational story, 3')		
			Study 2b	Effect of accumulating training times		
			31 YG	4 days (2 sessions; 2nd session 72 hours later)	Same as Study 2a + ↑ retention effect (after 6 days)	↓* S
		12-13, Ø	School		↓* P	

		No OA	EDU dual training tasks: evaluative conditioned reflex technology + video viewing task (counter-stereotypes situational story, 3')		
Lichtenstein et al. (2001)	Quasi-experimental	782 YG 11-14, 52.6%	36 weeks (incorporated) School EDU Positively Aging® teaching materials	Key lessons (e.g., practical exercises) > conducive to changes in YG's stereotypes, other lessons > conducive to changes in specific knowledge content	↓ S
USA		No OA	Incorporating aging education using examples from geriatrics + gerontology in mathematics + science curriculum; stereotypical attitudes toward aging		
Mellor et al. (2015, study 2)	Quasi-experimental	118 ^{EG+CG} YG 14.3 (0.83), 50.8%	4 weeks (4 sessions) School EDU lessons on OA in society, stereotypes, mutual respect, interpersonal skills	Effectiveness of EDU program; ↑ respect for OA = important in ↓ prejudices toward OA	↓* P
Australia		No OA	Discussions, games, role playing, case studies, homework tasks		
<i>Intergenerational contacts</i>					
Alcock et al. (2011)	Descriptive	18 YG 9-14, 27.7%	28 weeks (36 sessions x 90') Youth center + excursions IGC photovoice	Testing stereotypes + prejudices; ↑ awareness of similarities between generations; see OA as individuals	↓ S ↓ P ↓ D
UK		13 OA			

		65-80, 76.9%	Icebreaker + photography activities, writing to each other; exhibition of group's photos		
			Groups		
Belgrave (2011)	Quasi-experimental	12 YG 9-10, Ø	12 weeks (10 sessions x 30')	↑ interactions with small groups + dyads: ↑ intimacy + comfort can cause disabilities to disappear from YG's consciousness	↓ S ↓* D
USA	+ descriptive		Retirement living facility IGC music therapy		
		14 OA Ø, Ø	Singing, structured conversations, instrument playing, moving to music activities		
			Groups + dyads		
Carcavilla et al. (2020)	Quasi-experimental	24 YG 16.2 (0.97), 100%	6 weeks (12 sessions x 30')	OA health condition ≠ impediment to participate in the program: confronting prejudices	↓* P
Italy, Spain			Videoconference IGC Spanish teaching practice		
		21 OA 83.8 (7.89), 70%	OA = mentors for YG: help practicing + ↑ Spanish language skills; conversations		
			Dyads		
Cummings et al. (2004)	Quasi-experimental	40 YG 9-10, 48.9%	4 weeks (8 sessions x 1 day)	Positive interaction with OA: combatting stereotypes	↓* S
Australia			Seniors' center IGC outdoor classroom project on hands-on science techniques (based on usual curriculum)	Understanding the potential contribution of OA (supportive relationships, fostering of communication, mutual learning)	
		Ø OA Ø, Ø	OA = mentors for YG Discussions, interviews, art, music, gardening		

			Dyads		
Feyh et al. (2022) USA	Descriptive	12 ²⁰¹⁸ , 13 ²⁰¹⁹ YG 4-9, 61.5%	10 weeks x 2 iterations 2018 + 2019 (2 x 10 sessions x 45')	Expansion of internal perceptions of OA + experiences with OA; ↓ focusing on OA's physical appearance + deficits, ↑ OA's positive characteristics (jobs, behaviors, temperament)	↓ S
		16 ²⁰¹⁸ , 14 ²⁰¹⁹ OA 79-100, 86.7%	Long-term care facility IGC Get WISE: physical activities, games, presentations, music, crafts, food Common goal, supervision, promotion of communication + interactions	Variety of types of activities: ↑ interests + attention of participants Providing supervision + encouraging communication and social interactions to develop YG competencies	
			Dyads		
Hannon & Gueldner (2008) USA	RCT + descriptive	67 ^{EG+CG} YG 6-12, 53.7%	4 weeks (9 sessions x 60')	↑ realistic perception of OA during quality interactions: ↓ equate physical limitations with mental disabilities	↓* S
		17 OA 65-97, 70.6%	Summer camp IGC bonding activities, journal writing, discussions, music, games Large & small groups	See OA as providing value to society by teaching or talking about their past	↓ P
Heyman et al. (2011) USA	Quasi-experimental	32 YG 4.7 (0.49), 40%	12 weeks (9 sessions) Shared site (daycare/OA day program) IGC with numerous opportunities for spontaneous interactions + organized visits with activities	Be able to see beyond the OA's physical limitations (influenced by OA's strengths > limitations) if early, positive exposure to OA with physical & cognitive limitations	↓* S
		Ø OA Ø, Ø	Large & small groups		

Kamei et al. (2011) Japan	Pre- experimental + descriptive	7 YG	24 weeks (22 sessions x 180')	Quantity + quality of IGC: ↑ new relationships	→ S
		9.9 (1.4), 71.4%	Nursing school + historic sites	through communicating + enjoyment of	↓ P
			IGC St. Luke's Nagomi-no-kai program	activities with each other	↓ D
		14 OA ^{G1}	Games, art, having tea, visiting historic sites; OA	<i>Already positive view of OA</i>	
		75.6 (7.1), 100%	share wisdom, traditions, culture, personal history		
		8 OA ^{G2}	Groups		
		68.6 (8.8), 100%			
Kleijberg et al. (2020) Sweden	Descriptive	16 YG	Ø x 2 iterations 2016 + 2018 (2 x 5 sessions)	Reciprocal interactions: helping connections	↓ S
		9.0 (0.0), 50%	Community organization	(preferred by YG to hierarchical interactions)	↓ P
			IGC Studio DöBra: arts activities about topics +	OA seen as individuals with their own histories	
		16 OA	questions related to end-of-life	rather than solely as representatives of an age	
		65-93, 81.3%	Game, play, design, sculpture, collage, drawing, sewing; final exhibition	group (getting to know each other)	
			Groups	Active roles, collaborative arts activities supported by community organizations	
Pinquart et al. (2000) Germany	Quasi- experimental	32 ^{EG+CG} YG	6 weeks (6 sessions x 90')	Possible to change stereotypes over a short	↓*a S
		9.4 (0.9), 81%	Senior centers	intervention (if concrete rating object)	
			IGC puppet show	<i>General age stereotypes highly resistant to</i>	
		20 OA	Choose fairy tale, create story for puppet show,	<i>change; contact with? outside group may be</i>	
		71.7 (8.3), 100%	make glove puppets, perform show	<i>less positive: interaction group perceived as</i>	
			Groups & dyads	<i>positive exception to the rule (no</i> <i>generalization)</i>	

Santini et al. (2018) Italy	Descriptive	25 YG	32 weeks (27 sessions x 120')	Gradually overcome + abandon stereotypes:	↓ S
		14 (Ø), 28%	Multiple locations	recognize human, relational + social value of	↓ P
		16 OA ^{G1}	IGC Let's Re-Generate program	OA despite disability + generate new beliefs on	↓ D
		70 (Ø), 68.8%	Institutionalized OA + active OA met; active	which YG could build future choices + actions;	
		16 OA ^{G2}	OA = mentors for YG; discussions, art,	encourage YG critical thinking	
		16 OA ^{G2}	storytelling, games, music, acting		
		83 (Ø), 62.5%	Small groups		
Teater (2018) UK	Descriptive	12 YG	1 day (1 x 180') + 2 weeks reflection	Changes mediated by quality of contact +	↓ S
		11-12, Ø	School	anxiety level; communication, getting to know	↓ P
		8 OA	Draw + paint portrait of OA + engage in	each other; anxiety dissipated with contact	↓ D
		65+, Ø	afternoon tea	theory's conditions; distractor, mediator,	
		65+, Ø	Triads + dyads	bonding agent + aid for relaxation; challenge	
				stereotypes, see commonalities + OA as	
				individuals	
Combined					
Babcock et al. (2016) USA	Quasi- experimental	25 YG	4 weeks (4 sessions)	<i>Prejudices already ingrained, exposure to OA</i>	→ P
		10-11, Ø	School	<i>too brief; YG use of stereotypical knowledge</i>	
		6 OA	EDU lessons on aging + stereotypes; IGC	<i>instead of information about OA's unique</i>	
		Ø, Ø	discussions + activities relevant to lessons;	<i>individual attributes; healthy, socially engaged</i>	
		Ø, Ø	reflection on learning (journal writing)	<i>OA may not reflect YG's view of aging</i>	
			Small groups		

Babcock et al. (2018) USA	Pre- experimental + descriptive	23 YG 11+, 65.2%	6 weeks (6 sessions) School Bridges Together program	Enthusiasm for program may lead to continued high quality IGC & relationships, leading to ↓ ageism	→ S → P ↓ D
		10 OA Ø, Ø	EDU defining aging; IGC team building, storytelling, interview, leisure & art activities Small groups	<i>Stereotypes & prejudices already ingrained, not enough time or information to reduce YG's implicit bias</i>	
Chowdhary (2002) USA	Pre- experimental	97 YG 12-15, 47.5%	1 week (5 sessions) School + OA own places EDU lessons on aging + stereotypes (picture analysis, videotape); IGC visit with OA, interview, help with household chores; discussion on experience with OA Groups + dyads	Concerted efforts on various fronts probably influenced YG's bias <i>Facts on aging rated as boring by YG: less effective activity to change prejudices</i>	↓* S ↑* P ↓* D
Gamliel & Gabay (2014) Israel	Pre- experimental + descriptive	27 YG 11-12, Ø 24 OA 66-77, Ø	12 weeks (12 sessions x 120') School Multigenerational connection program EDU skills-facilitation pre-collaborative workshop (OA learning style, interpersonal communication skills); IGC mutual mentoring: YG teach OA computer + internet skills; OA share life stories + help YG with schooling	Generations getting closer + ↑ confidence (feelings of being valued, accepted + respected) Development of generational intelligence Flexibility in generational roles (including both procedural + declarative knowledge)	↓* P

Dyads					
Kim & Lee (2018) Korea	RCT	30 YG 16-17, 100%	8 weeks (2 sessions x 50' + 6 sessions x 90') Nursing homes	Positive interactions improve positive perception of OA (better adaptation to social environment)	↓* S ↓* P
		30 OA 9 ≤ 79, 21 ≥ 80, 90%	EDU+IGC Sessions on intimacy, positive emotions, images of OA, art, music; sessions on IG communication, interview with reminiscence therapy; sessions on discussing feelings from the IG interactions, writing journal		
			Small groups		
Klein et al. (2005) USA	Quasi- experimental	91 YG 14-15, Ø Ø OA 65+, Ø	1 day (3 sessions x 20' + 1 session x 20') School Aging fair program EDU interactive discussions: demographics of OA population, comparisons YG + OA; similarities + differences, health aspects of aging; IGC OA “heroes” storytelling + interviews; ↑ YG engagement: decoration, candy reward	<i>Confounders (education, interactions with OA, family setting); changing prejudices in middle school + high school extremely difficult (intervention too brief)</i>	→ P
Lynott & Merola (2007)	Pre- experimental	92 YG 8-10, 45.7%	21 weeks (4 sessions x 150' + lessons) School + life care community	Both generations ↑ understand + appreciate each other; YG saw OA as vital and interesting despite physical aspect	↓* ^b S

USA		68 OA 66-97, 72.1%	EDU+IGC Program incorporated into the curriculum Prior to first IG meeting: information about the historical times OA had experienced, stereotypes of aging + how to interview OA; leisure, storytelling, social visits, discussions, interviews, writing, art Groups		
Schwalbach & Kiernan (2002)	Pre-experimental + descriptive	22 YG 9-10, 50%	21 weeks (21 sessions + 18 sessions) School + OA nursing home EDU lessons on stereotypes & prejudices toward	↑ realistic view of aging (balanced challenges + benefits of growing old); sufficient time to form significant relationships with OA, interact in meaningful ways + process feelings in discussions + journals; pre-visit activities + discussions: avoid being negatively affected by interactions with frail OA <i>Some YG still learning to think abstractly + generalize</i>	↓ [†] P ↓ D
USA		12 OA Ø, 83.3%	OA + aging; IGC guided exploration, healthy & active OA guest speakers, discussions, role playing, simulation, videotaping; friendly visits to OA + enjoyable shared activities; art, games, reading, cooking, talent show, storytelling Groups		
Sun et al. (2019)	Quasi-experimental	77 YG 16.3 (1.47), 47.4%	6 weeks (1 session, 2 sessions x 120', 2 sessions x 450' + 2 sessions x 120') Multiple locations	Access to information sharing & contact with OA outside the family; ↑ sense of comfort: facilitating high quality IG interaction & collaboration, ↑ solidarity, ↑ positive views +	↓* P ↓* ^b D
China		73 OA			

72.5 (7.18), 80.8%	EDU stimulation stage: simulations, reflecting on what is experienced + learned, YG receiving photos of OA made to look younger; IGC consolidation stages: discussion of common goals + choice of site visit, preparation for the visit + post-site visit; group presentations Large + small groups + dyads	experiences of each other, ↑ communication skills, cohesion + personal relationships
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Only the experimental group (EG): sample size of young people (YG) or older adults (OA), age in years, minimum-maximum or mean (M) and standard deviation (SD), percentage of girls

† Duration of the intervention in weeks, number of sessions and duration of each session in minutes (') when mentioned, setting and content

‡ Mechanisms explaining positive outcomes; *in italics: mechanisms explaining negative outcomes*

Note. ∅ = not mentioned; n/a = not applicable; EG = experimental group; CG = control group; G1 = group 1; G2 = group 2; EDU = educational intervention; IGC = intergenerational contact intervention; RCT = randomized controlled trial; S = stereotypes; P = prejudices; D = discrimination; ↓ = decrease; → = no change; ↑ = increase; * = significant; > = more; a = for both experimental and control groups; b = partially significant; c = mixed outcomes

