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Intergroup Contact and Grandparent–Grandchild Communication: The Effects of Self-Disclosure on Implicit and Explicit Biases Against Older People

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This study investigated contact and ageism on both the implicit and the explicit level. We examined the role of grandparent–grandchild communication (in terms of self-disclosure) and its relations to anxiety and empathy in improving intergenerational attitudes. Analyses revealed that: (1) quantity and quality of contact with older people (other than grandparents) predict higher levels of self-disclosure (to one's grandparent); (2) quantity (but not quality) of contact with older people is associated with more favorable implicit associations with them, while quality of contact is associated with more favorable explicit attitudes; and (3) higher levels of self-disclosure to grandparents are associated with empathy and reduced anxiety, which in turn are associated with more positive explicit attitudes toward older adults. We explain our findings in light of the environmental associations model (Karpinsky & Hilton, 2001)—that quantity of contact, or mere exposure to older people, drives the Implicit Association Test effect. The model sheds light on the mediational roles of interpersonal variables (self-disclosure, anxiety, and empathy with a grandparent) in intergenerational contact.

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AGEISM is a major issue in our society and can be observed in the workplace (Finkelstein, Burke, & Raju, 1995), in the health system (Grant, 1996), and in the media (Harwood & Anderson, 2002). Age is, in fact, one of the most salient categorizations people use (Hamilton & Sherman, 1994) and is one of the first characteristics we notice about other people (Fiske, 1998; Kite, Deaux, & Miele, 1991). However, age categorization research has received significantly less attention than research on gender, ethnic, and racial categorizations (Montepare & Zebrowitz-McArthur, 1998; Pasupathi, Carstensen, & Tsai, 1995). Beliefs about the elderly being unable to contribute to society, and attitudes of dislike toward them are prevalent (Kite & Johnson, 1988), and although there is a lack of strong, explicit hatred toward older adults, the widespread occurrence of socially acceptable expressions of negative attitudes toward them has been well documented (Williams & Giles, 1998). Given this context, research on *implicit* bias against older people is important.

Implicit measures differ from explicit (or self-report) measures in that they reflect biases to which people lack introspective access. Such associations may be automatically activated by the mere presence of an attitude object (i.e. the outgroup), and reflect *unintentional* bias, of which would-be unprejudiced people may be largely unaware (Dovidio, Kawakami, & Gaertner, 2002). People are often reluctant to admit to tendencies revealed by implicit measures (Greenwald et al., 2002), especially in studies of prejudice and stereotyping (e.g. Devine, Plant, Amodio, Harmon-Jones, & Vance, 2002). Nosek, Banaji, and Greenwald (2002) found that the effect sizes of implicit ageism (against older as compared to younger people) are strikingly large (Cohen's $d = 1.42$); they were, in fact, consistently larger than those of both *explicit* ageist attitudes ($d = .28$) and implicit bias against Black Americans (compared to White Americans; $d = .88$).

Although people in Western society have negative attitudes toward older people, they generally have mostly positive views of *specific* older persons (e.g. grandparents, older co-workers, older friends; Kite & Johnson, 1988). Harwood, Hewstone, Paolini, and Voci (2005) explain the dissociation between positive attitudes toward specific elderly people and negative attitudes toward elderly people in general by casting it in the light of intergroup processes. Exploring the moderators of contact, they found that positive attitudes toward a grandparent generalized to the elderly as a whole when that grandparent was seen as 'elderly'. Our study further explored the more interpersonal potential mediators of the contact experience; we examined the specific processes of self-disclosure, anxiety, and empathy with a *grandparent* (as opposed to the elderly in general), and examine the effects of these processes to attitudes toward the elderly in general. Interpersonal factors that contribute to intimate affective experience are especially important for attitude change (Pettigrew, 1997).

Like other forms of prejudice, ageism can be combated with increased positive contact between younger and older people (Caspi, 1984), and we view the grandparent–grandchild relationship to involve both the personal and intimate as well as *intergroup* dimensions so crucial to mediating attitude change (Brown & Hewstone, 2005). Previous research lends support to the causal influence of contact on ageist attitudes. Longitudinal research (e.g. Herek & Capitanio, 1996), comparisons of reciprocal pathways in cross-sectional research (e.g. Pettigrew, 1997), and a meta-analysis of contact (Pettigrew & Tropp, 2000) have supported the causal sequence stemming from contact to prejudice reduction, rather than the other way around.

The impact of intergroup contact on prejudice is maximized when four features of the contact situation are present: equal status between the groups in the situation, common goals, intergroup cooperation, and the support of institutions and authorities for the contact experience (Allport, 1954/1979; Pettigrew & Tropp, 2000). Furthermore, personal, intimate

contact is important and should be fostered by the situation (Pettigrew & Tropp, 2000). Allport outlined a number of factors constituting the 'nature of contact' (see Allport, 1954/1979, pp. 262–263). These factors included measures of the *quantity* of contact (frequency, number of persons involved, etc.) and more specific measures of its *quality* (status and role aspects of contact, the social atmosphere surrounding contact, etc.). Reviews of the literature have highlighted the particularly beneficial effects of high-quality contact (Amir, 1969; Pettigrew & Tropp, 2000). As Allport put it, 'contact must reach below the surface in order to be effective in altering prejudice' (Allport, 1954/1979, p. 276).

One of the key aspects of intergroup contact is, we argue, the nature of the communication that takes place (Fox & Giles, 1993). Pettigrew (1998) explicitly calls for contact situations to provide participants with the opportunity to make self-disclosure and other friendship-developing mechanisms possible. Because grandparents are likely to be the main contacts young people tend to have with older people (Ng, Liu, Weatherall, & Loong, 1997) and because the family relationship is likely to facilitate the kind of long-term close relationships that maximize the positive effects of contact (Banker & Gaertner, 1998), we investigate the impact that grandparent–grandchild relationships will have on attitudes toward older people in general. Thus, the aims of the study are: (1) to examine the influence of interpersonal contact with grandparents (with regards to self-disclosure) on attitudes toward the elderly; and (2) to examine *how* self-disclosure affects these attitudes. We predict that higher empathy and lower anxiety with grandparents mediate the effect of self-disclosure on positive attitudes toward the elderly. As Ensari and Miller (2002) suggest, we view self-disclosure as a more precise measure of quality of contact with grandparents that is associated with positive relationships (Dolgin & Minowa, 1997). Contact and communication are relevant variables that have not yet been explored with regard to the implicit and explicit distinction, and thus we investigate how contact with older

people and communication with grandparents predict ageism on the implicit as well as the explicit level.

Self-disclosure in grandparent–grandchild communication: Reducing ageist attitudes

Self-disclosure is the act of voluntarily providing information to another that is of an intimate or personal nature (Omarzo, 2000). Presenting these significant aspects of the self to another is important in the development and maintenance of a relationship (Jourard, 1971). In intergroup relations research, self-disclosing information has been shown to reduce the negative bias toward the outgroup that ordinarily characterizes intergroup relations (Ensari & Miller, 2002). These findings support Pettigrew's (1998) view that self-disclosure is a central process in cross-group friendship.

Personalized interaction during contact directs attention toward individual members of the outgroup, emphasizing their individuating features (Fiske & Neuberg, 1990) and increasing liking for those individuals (Berg & Wright-Buckley, 1988). Disclosure reduces threatening aspects of interaction with outgroup members by promoting individuation and familiarity (Miller, 2002). Thus, the act of disclosing personalizes members of the outgroup, undercutting default, category-based impressions (Krueger & Rothbart, 1988; Wilder, 1978) as well as promoting intimacy (Laurenceau, Barrett, & Pietromonaco, 1998) and more complex, differentiated perceptions of the outgroup (Harwood et al., 2005).

Intimate information, being more rarely discussed and less readily available than non-intimate information, is more greatly valued (Petty & Mirels, 1981). Receiving intimate information is rewarding because such information is normally only shared with friends (Lynn, 1978). Furthermore, disclosure of intimate information often induces reciprocal disclosure and fosters mutual trust between members of different groups (Steel, 1991; Worthy, Gary, & Kahn, 1969). In addition, self-disclosure has positive

effects on attitudes toward the discloser (Collins & Miller, 1994) as well as toward the discloser's group (Ensari & Miller, 2002), hence reducing intergroup bias. Thus, we hypothesized that self-disclosure with grandparents would predict lower levels of bias against older people as a whole. Grandparent-grandchild relationships begin with the birth of the grandchild, and thus we expect the causal direction to stem from communication between grandparents and grandchildren to general ageism rather than the other way around.

Self-disclosure and anxiety in communication

Upon receiving self-disclosure, people are better able to understand and predict a discloser's behavior (Berger & Bradac, 1982); recipients thus feel more in control of their environment and less anxious. Empirical evidence (Gudykunst, 1995; Gudykunst & Shapiro, 1996; Hubbert, Gudykunst, & Guerrero, 1999) has shown that individuals can communicate effectively only to the extent that they are able to manage their anxiety and accurately predict and explain others' attitudes, feelings, and behaviors. Management of anxiety is therefore seen as vital for effective communication (Gudykunst, 1995).

Anxiety is higher in intergroup than interpersonal encounters (Gudykunst & Shapiro, 1996). Indeed, Stephan and Stephan (1985, 2000) have developed the specific notion of 'intergroup anxiety' which primes negative reactions to outgroup members by strengthening stereotyping (Wilder, 1993). Anxiety also leads to distrust of an outgroup (Dovidio, Gaertner, Kawakami, & Hodson, 2002), perhaps because it narrows attention and limits the capacity for extensive processing, thus preventing attitude change (Stephan & Stephan, 1985; Wilder & Simon, 2001). Intergroup anxiety has been shown to be a mediator of the effect of intergroup contact on attitudes toward outgroups (Islam & Hewstone, 1993; Paolini, Hewstone, Cairns & Voci, 2004; Voci & Hewstone, 2003). In light of this research, we suggest that self-disclosure with grandparents is associated with

lower levels of anxiety and thereby lower levels of bias toward the elderly as a whole; we further examine the role of anxiety as a potential mediator of the effect of self-disclosure on attitudes toward older people.

Self-disclosure and empathy in communication

In addition to reducing anxiety for the recipients of disclosures, self-disclosure serves to give the disclosers control of how others see them (Berger & Bradac, 1982). By self-disclosing, disclosers tell others how to understand the way they see themselves, or how to empathize with them. In an event-contingent diary study of self-disclosure, Laurenceau et al. (1998) showed that self-disclosure and its reciprocation are linked to feelings of intimacy. Aron, Melinat, Aron, and Vallone (1997) similarly found that participants engaged in self-disclosure tasks generated greater closeness than those engaged in comparable small talk tasks. These self-disclosure tasks also facilitated an 'expansion' of the self to include, first, the outgroup individual and then the outgroup as a whole. Aron, Aron, and Smollan (1992) argue that in close contact, the outgroup is included in the perception of self; the representation of the self comes to include the outgroup, and the outgroup is accorded benefits usually reserved for the self, i.e. empathy.

Given the importance of self-disclosure in increasing closeness, intimacy, and inclusion of the other in the self, we suggest that self-disclosure is associated not only with reduced anxiety but also with increased empathy toward outgroup members—itsself an important step in prejudice reduction. Empathizing with a member of a stigmatized group leads to reductions in bias against the group as a whole (Batson, Polycarpou, Harmon-Jones, & Imhoff, 1997) and also influences people's motivations to *behave* in a more supportive way toward others, independent of how much they like them (Batson & Shaw, 1991). Finlay and Stephan (2000) likewise reported improvements in Whites' attitudes toward Blacks after participants read a series of short essays

ostensibly written by Black students about the discrimination they had faced.

In this study, we investigate the mechanisms by which self-disclosure reduces biases against older people. Considering the importance of both empathy and anxiety in intergroup relations, we examine empathy and anxiety simultaneously as potential mediators of the effect of self-disclosure on outgroup evaluations. We predict that self-disclosure is associated with higher empathy and lower anxiety in interactions with grandparents, which are, in turn, associated with more positive attitudes toward older people as a whole.

Implicit measures

Because educational, institutional, and cultural socialization promote equality and fairness between groups, people are often reluctant to admit to prejudice against older people (Greenwald et al., 2002). Implicit measures are thus important for examining societal biases against older people. Although evidence suggests that exposure to outgroups may change implicit biases (Dasgupta & Greenwald, 2001), little research has examined the association between actual intergroup contact and implicit bias toward outgroups. It is important however to explore these in relation to explicit bias because: (1) self-reported outgroup evaluations often reflect social desirability and are seldom correlated with implicit and physiological measures of outgroup evaluation (Fazio & Olson, 2003); (2) implicit biases are automatic and more resistant to change than are explicit biases (Bargh, 1999; Fazio, Jackson, Dunton, & Williams, 1995); and (3) explicit and implicit measures of attitudes predict different sorts of behaviors; whereas explicit measures of attitude predict more deliberative and controlled behavior, implicit measures predict more spontaneous, or automatic, behavior (Chen & Bargh, 1997; Dovidio, Kawakami, & Gaertner, 2002). The MODE model (Fazio, 1990) suggests that explicit and implicit measures correspond only in regard to nonsocially sensitive issues, while socially sensitive issues such as prejudice evoke a motivation to respond in a more socially desirable manner.

Whereas explicit attitude measures reflect an individual's level of endorsement of (or preference for) an attitude object, recent evidence suggests that the Implicit Association Test (IAT), rather than tapping implicit *attitudes* (see Greenwald, McGhee, & Schwartz, 1998), merely reflects the associations a person has been exposed to in his or her environment (Karpinski & Hilton, 2001)—culturally shared, but not necessarily individually accepted, negative information about older people (and positive information about younger people). According to this environmental association model of the IAT, a high score on the Young–Old IAT, for example, does not indicate that the individual has more favorable evaluations of young people compared with older people. Instead, the score may simply indicate that the individual has been exposed to a larger number of positive-young and negative-old associations than negative-young and positive-old associations. Evidence suggests that the IAT reflects ‘extrapersonal’ associations, which are valence effects that come from sources other than participants' own individual personal associations with the object.

Mere exposure to all kinds of stimuli leads people to have more positive associations with them (Bornstein, 1989; Zajonc, 1968). Simple exposure to positively valued older exemplars (e.g. Mother Teresa) reduced implicit bias against the elderly on an IAT (Dasgupta & Greenwald, 2001). Similarly, exposure to word pairs linking ‘elderly’ with ‘good’ concepts and ‘young’ with ‘bad’ concepts had the same effect (Karpinski & Hilton, 2001). In both studies, the IAT following the manipulations reduced implicit ageism. We suggest that intergroup contact is associated not only with measures of *explicit* bias but also with more positive implicit associations, as intergroup contact—particularly *quantity* of contact—is a form of exposure to the elderly in the real world.

Overview of the present study

Previous research shows that ageism can be combated with increased positive contact between younger and older people (Caspi, 1984). Our study aims to investigate *how* this

works and explores the more interpersonal (as opposed to intergroup) potential mediators of the contact experience; we examine self-disclosure toward grandparents, the anxiety felt toward them, and empathy with them (as opposed to the elderly in general). These interpersonal intimate relations are crucial to the contact experience because they influence the powerful affective domain (Pettigrew, 1998). In our view, the grandparent–grandchild relationship itself involves both the interpersonal as well as intergroup dimensions so crucial to mediating attitude change (Brown & Hewstone, 2005; Soliz & Harwood, in press). We also explore how different aspects of intergroup contact (quantity vs. quality of contact) relate to implicit associations as well as explicit outgroup evaluation, with the following hypotheses specifically in mind:

Hypothesis 1. We predict that quantity and quality of contact with older people are associated with more self-disclosure with grandparents and more positive explicit attitudes toward older people.

Hypothesis 2. We further predict that quantity (rather than quality) of contact with older people is associated with more positive implicit associations for older people.

Hypothesis 3. We predict that: (a) self-disclosure mediates the relationship between contact and both anxiety and empathy with grandparents; and that (b) anxiety and empathy mediate the effects of self-disclosure on ageist attitudes.

Method

Seventy-seven native English speakers at a British university (27 males, 50 females; mean age 20.1 years) participated. All respondents received course credit for their participation in this study.

Measures

All measures regarding grandparents refer to the grandparent with whom participants interacted most regularly (or did so until that grandparent's death). There were no significant

gender or age effects on any of the measured variables. All measures achieved normality unless otherwise indicated.

Quantity of contact with older people other than grandparents This was assessed by two items. In the first item, participants were asked in an open-ended measure how many older people other than their grandparents participants knew 'pretty well (e.g. know their names, could chat easily with them)'. This significantly and positively skewed item (Skew = 2.4, *SE* Skew = 0.27) was transformed logarithmically (Tabachnik & Fidell, 2001) to achieve normality (Skew = 0.12, *SE* Skew = 0.28). In the second item measuring quantity of contact, participants rated the amount of contact they had had with older people other than their grandparents on a scale from 1 (*very low*) to 7 (*very high*). These two items were standardized and combined to yield a reliable scale (Cronbach's alpha = .71).

Quality of contact with older people other than grandparents This was assessed with three items. Participants were asked how well they 'get along with older people (other than your grandparents)' on a scale from 1 (*very poorly*) to 5 (*very well*), how 'emotionally close' they felt toward older people (other than grandparents) on a scale from 1 (*very distant*) to 5 (*very close*), and how they rated the 'quality of communication' with older people other than grandparents on a scale from 1 (*very poor*) to 5 (*very good*) (Cronbach's alpha = .78).

Self-disclosure to grandparent Self-disclosure was measured using three items about the target grandparent: 'How much do you express your feelings to this grandparent?'; 'How much personal information do you disclose?'; and 'How personal is the information you disclose?' on a scale from 1 (*not at all*) to 7 (*very much so*). The three items were derived from Laurenceau et al. (1998), and they constituted a reliable measure of self-disclosure (Cronbach's alpha = .84).

Anxiety with grandparent The measure of anxiety with participants' grandparent was a

modified version of the intergroup anxiety scale developed by Stephan and Stephan (1985). Similar shortened versions of the intergroup anxiety scale have been used previously (e.g. Paolini et al., 2004; Voci & Hewstone, 2003). Three items asked participants how they would feel when interacting with their grandparents: self-conscious, relaxed (reverse-coded) and awkward, on a scale from 1 (*not at all*) to 7 (*extremely*) (Cronbach's alpha = .78).

Empathy with grandparent The empathy measure was adapted from Davis' (1983) Interpersonal Reactivity Index: 'If this grandparent disclosed something very personal (e.g. a problem that she or he is facing), were you able to relate to this grandparent?' (e.g. did you feel concern for the other person?) on a scale from 1 (*not at all*) to 7 (*completely*), 'How difficult is it for you to see things from the point of view of this grandparent?' on a scale from 1 (*not at all difficult*) to 7 (*extremely difficult*), and 'Were you able to put yourself in this grandparent's shoes (see things from the other person's perspective)?' on a scale from 1 (*not at all*) to 7 (*completely*) (Cronbach's alpha = .72).

Explicit attitudes toward older people Using the General Evaluation Scale (Wright, Aron, McLaughlin-Volpe, & Ropp, 1997), participants were asked to indicate the degree to which they felt negative-positive, friendly-hostile (reverse-coded), contempt-respect, and admiration-disgust (reverse-coded) toward older people (on bipolar scales ranging from 1 to 7). The four items created a reliable index reflecting explicit attitudes toward older people (Cronbach's alpha = .76).

Implicit attitudes toward older people: The Implicit Association Test (IAT) Participants completed a version of the IAT (Greenwald et al., 1998) on the computer, which measured the degree to which they automatically associated old and young names with positive and negative evaluations. Previous studies (e.g. Nosek et al., 2002) found greater effect sizes in IATs with names than with faces; thus, the current study used names associated with old

and young people. In a pretest, nine British undergraduates rated 58 names (from Dunkling, 1991) on a scale from 1 (*very typical for young person*) to 5 (*very typical for old person*). Eight old names (e.g. Elsie) and eight young names (e.g. Zoe) were selected from this list. We tested the difference between the mean and the midpoint (3) of the response scale for the old names ($M = 4.54$, $SD = .47$; $t(8) = 9.89$, $p < .001$) and the young names ($M = 1.73$, $SD = .47$; $t(8) = -7.86$, $p < .001$).

In presenting the IAT, we followed the methodology outlined by Greenwald et al. (1998). Each participant was seated at a computer, and instructions were presented both verbally and in writing. In the IAT task, participants made key presses to categorize names that appeared in the middle of the screen as 'young' or 'old' (e.g. Elsie, Zoe) while simultaneously categorizing words as 'pleasant' (e.g. lucky, rainbow) or 'unpleasant' (e.g. ugly, rotten). Response latency differences provided the measure of implicit group evaluation. Negative scores indicated more negative associations with older people relative to young people, and positive scores indicated more positive associations with older people relative to young people (IAT procedures are shown at: <http://implicit.harvard.edu/implicit/>). Participants received feedback (i.e. a red X appeared) when they made incorrect categorizations (e.g. 'vomit' as 'pleasant' or 'Elsie' as 'young'). The computer recorded the reaction times of each trial in milliseconds from the initial appearance of the target to the correct response. The IAT took approximately 10 minutes to complete.

We followed the new scoring algorithm for the IAT (Greenwald, Nosek, & Banaji, 2003). Participants who had more than 10% of trials with latencies less than 300 ms were removed, as they were simply pressing *any* key in this case. All trials with latencies greater than 10,000 ms were removed, as these were extremely slow reaction times that indicate attention was elsewhere or that participants had problems with the test. To examine the reliability of the IAT, we compared the IAT scores for participants on even and odd numbered trials (Cronbach's alpha = .73).

Results

Descriptive statistics and correlations are noted in Table 1. Participants knew, on average, nine older people ‘pretty well’, and the amount of contact they had with older people other than their grandparents was moderate ($M = 3.60$), as was their *quality of contact* ($M = 3.44$). Participants reported low levels of *anxiety* ($M = 2.68$), medium levels of *self-disclosure* ($M = 4.04$), and somewhat high levels of *empathy* ($M = 5.11$) during interactions with their grandparents. Participants had somewhat positive *explicit attitudes* toward the older people ($M = 5.30$), but IAT scores revealed implicit negative associations with older people, relative to younger people. IAT scores ranged from -1.31 to 0.04 , with only one participant’s score being positive (i.e. biased *in favor* of older people).

In our first hypothesis, we predicted that quantity and quality of contact with older people are associated with more self-disclosure with grandparents and more positive attitudes toward older people. Zero-order correlations (see Table 1) confirmed that both quantity and quality of contact were related to self-disclosure ($r = .43$ and $r = .51$, respectively, both $p < .001$). However, only quality of contact was related to explicit attitudes ($r = .32$, $p < .01$); quantity of contact was, on the other hand, unrelated to explicit attitudes ($r = .11$, *ns*).

In our second hypothesis, we predicted that the quantity of contact with older people would be associated with more positive implicit associations with older people. The results confirmed our second hypothesis. While quality of contact was associated with more positive *explicit* attitudes, quantity of contact was associated with more positive *implicit* associations.

In the third hypothesis, we predicted that (a) anxiety and (b) empathy mediate the effects of self-disclosure on ageist attitudes. To test for this mediational effect, we constructed a structural equation model (SEM) with directly observable variables, or path analysis. Although SEM with latent variables is preferable, our sample was smaller than 100—the minimum size generally recommended for SEMs with latent variables (Hair, Anderson, Tatham &

Table 1. Correlation matrix

	Quantity of contact with elderly	Quality of contact with elderly	Empathy with GP	Anxiety with GP	Self-disclosure to GP	Explicit attitudes toward elderly	Implicit attitudes toward elderly
Quantity of contact with elderly	—						
Quality of contact with elderly	.39**	—					
Empathy	.17	.27*	—				
Anxiety	-.22*	-.17	-.36**	—			
Self-disclosure	.51***	.43**	.38**	-.37**	—		
Explicit attitudes	.11	.32**	.38**	-.37**	.26*	—	
Implicit attitudes	.25*	.05	.06	.01	.09	-.01	—
Mean (SD)	2.7(1.2)	3.4(.75)	5.1(1.1)	2.7(1.2)	4.0(1.4)	5.3(0.8)	- .65(.30)
Reliability	.76	.77	.73	.84	.72	.73	.73

* $p < .05$; ** $p < .01$; *** $p < .001$; $N = 77$.

^a The first item of quantity of contact measure was transformed into a 1–7 scale in order to be consistent with the second item.

Note: GP = grandparent.

Black, 1998).² The tested model (see Figure 1) considered the relations between quantity and quality of contact with the elderly, as predictors, and explicit and implicit attitudes as criterion or outcome variables, and included variables related to grandparent-grandchild communication (self-disclosure, anxiety, and empathy) as potential mediators, using Lisrel 8 (Jöreskog & Sörbom, 1996).

We examined (1) the direct effect of the quantity of contact on implicit associations and (2) a chain which started from quantity and quality of contact, goes to self-disclosure, passes through anxiety and empathy, and finally reaches explicit attitudes. Certain paths were excluded *a priori*, in order to test our predictions about mediational processes. We tested *self-disclosure* as a mediator of the influence of contact on both anxiety and empathy with grandparents, and *anxiety* and *empathy* as mediators of the impact of self-disclosure on explicit attitude; we thus excluded the direct paths between contact and anxiety, between contact and empathy, and between self-disclosure and explicit attitude in our model.

The tested model (Figure 1) fitted the data well: $\chi^2(12, N = 77) = 7.48, p = .82$; root mean square error of approximation (RMSEA) = .00; standardized RMR = .052; comparative fit index (CFI) = 1.00 (good fit is indicated by a non-significant chi-square test, an RMSEA of less than .06, a standardized RMR of less than .08, and a CFI value greater than 0.95; Hu & Bentler, 1999). The fact that the model fitted the data well without the direct paths mentioned above confirmed the mediational role of self-disclosure, empathy, and anxiety. The results reported in Figure 1 represent all the estimated parameters.

The results showed that (1) quantity of contact with the elderly had a direct positive effect on implicit associations with the elderly and (2) quantity and quality of contact had a positive effect on self-disclosure to grandparents. (3) Self-disclosure, in turn, had a negative effect on anxiety with grandparents, as well as a positive effect on empathy with grandparents, and (4) both anxiety and empathy predicted explicit attitudes toward the elderly.

Although the goodness-of-fit indices already suggested the presence of mediational processes,

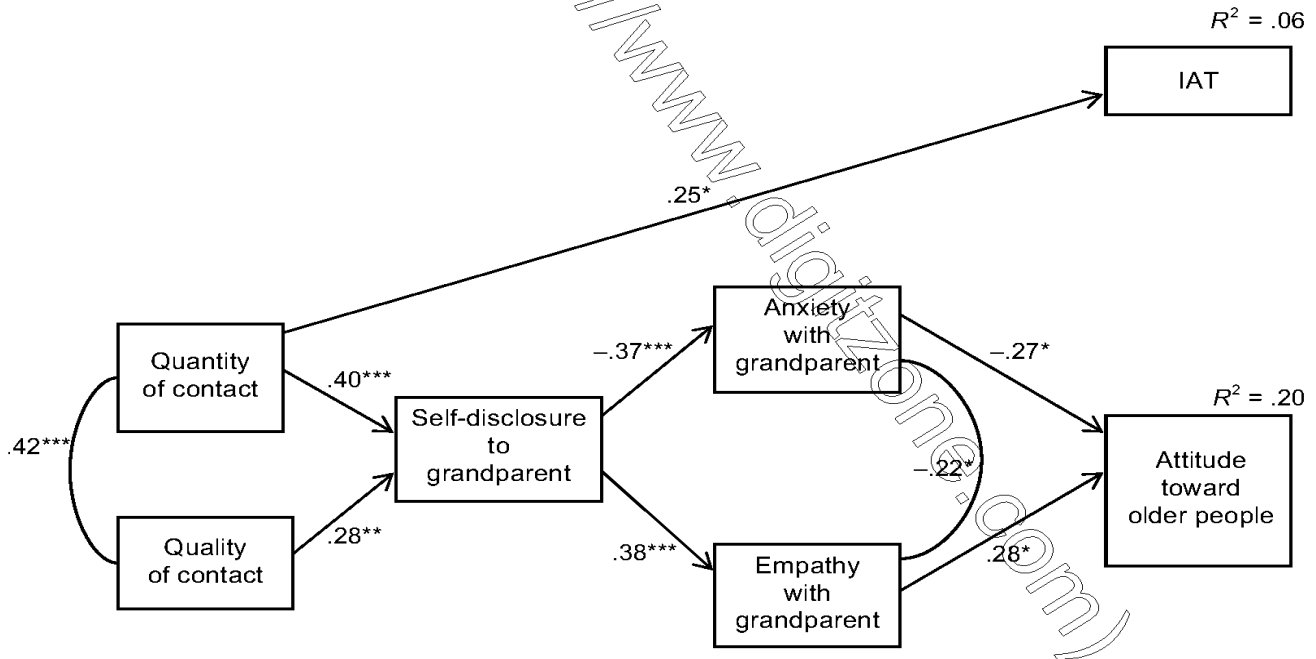


Figure 1. The effects of contact on attitudes toward the elderly, mediated by self-disclosure, anxiety, and empathy with grandparents.

* $p < .05$; ** $p < .01$; *** $p < .001$; $N = 77$.

we conducted further analyses to confirm this result. We added all of the direct links from contact quantity and quality to empathy and anxiety, and we also added the direct link between self-disclosure and explicit attitudes. We then adopted the distribution of products method, described by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002), computing the products of *z* scores for each couple of critical paths.³ The results reported in Table 2 indicate that: (a) all the direct paths inserted in the model were nonsignificant; (b) the mediations of self-disclosure, empathy, and anxiety were reliable and complete.

Discussion

In our first hypothesis, we predicted that quantity and quality of contact with older people would be associated with more self-disclosure with grandparents and more positive attitudes toward older people. While quality of contact was related to both self-disclosure and more positive attitudes, quantity of contact was only related to self-disclosure, but not explicit attitudes. Although our results only partially support our hypothesis, they are in line with previous research that demonstrates the importance of *quality* of contact for improving intergroup relations and lowering prejudice (Allport, 1954/1979; Pettigrew & Tropp's (2000) meta-analysis).

We predicted in our second hypothesis that quantity (but not quality) of contact would be

related to higher IAT scores. Supporting the environmental association model (Karpinski & Hilton, 2001) and mere exposure effect (Bornstein, 1989)—which state that more positive implicit associations stem from repeated positive exposure to a stimulus object—we found quantity of contact with older people (but not quality) was associated with more positive implicit associations for older people.

As we predicted in the third hypothesis, (a) self-disclosure mediated the relationship between contact and both anxiety and empathy with grandparents, and (b) anxiety and empathy mediated the effects of self-disclosure on ageist attitudes. Our model (see Figure 1) draws together previous findings in the literature to investigate the interpersonal (grandparent–grandchild) mediators involved in implicit and explicit ageism. This research provides a picture of how intergroup contact with older people and communication with grandparents affects explicit attitudes and implicit associations. Our results, first of all, highlight the effect of self-disclosure on prejudice through simultaneously reducing anxiety and increasing empathy. Lowered anxiety is essential for effective interpersonal and intergroup communication and reducing feelings of unease, tension, or apprehension about what might happen (Gudykunst, 1995; Islam & Hewstone, 1993; Stephan & Stephan, 1985). Self-disclosure not only reduces the negative process of anxiety, it also induces the positive development of closeness and empathy (Aron et al., 2004). As we

Table 2. Mediation effects of self-disclosure, empathy and anxiety

Independent (IV)—Dependent (DV) variables	Mediator	Relation			MacKinnon et al. (2002)'s product of <i>z</i> scores $z_{\alpha} z_{\beta} =$	
		IV—DV	IV—mediator	Mediator—DV		
Quantity of contact—Empathy	Self-disclosure	-.07	.40***	.36***	10.61	<i>p</i> < .01
Quantity of contact—Anxiety	Self-disclosure	-.05	.40***	-.34**	-9.88	<i>p</i> < .01
Quality of contact—Empathy	Self-disclosure	.14	.28**	.36**	7.51	<i>p</i> < .01
Quality of contact—Anxiety	Self-disclosure	-.01	.28**	-.34**	-6.99	<i>p</i> < .01
Self-disclosure—Explicit attitude	Empathy	.07	.36***	.26*	6.26	<i>p</i> < .01
Self-disclosure—Explicit attitude	Anxiety	.07	-.34***	-.25*	5.60	<i>p</i> < .01

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

predicted, these interpersonal variables (self-disclosure, empathy, and anxiety with a grandparent, as opposed to with older people in general) mediated the effect of contact on explicit attitudes toward older people. However, because our sample size was only 77, we consider this only preliminary data; future research is needed to replicate and confirm these findings.

In the following sections, we discuss: (1) the effect of intergroup contact quantity on implicit associations; (2) the more specific context of grandparent–grandchild communication and intergroup contact; and (3) generalization of the effects of interpersonal contact to explicit attitudes toward and implicit associations with the outgroup as a whole. We also consider alternative models in which other causal sequences are assessed and in which other measures (e.g. quality of contact with grandparents) are used.

The effect of intergroup contact on implicit associations and explicit attitudes

This study is the first to explore the effects of intergroup contact and interpersonal communication on *implicit* associations using the IAT. In line with our prediction, quantity of contact with older people predicted more positive implicit associations with them; in other words, people who were more familiar with elderly people held more positive implicit associations with them. In line with the mere exposure effect (Zajonc, 1968), familiarity (or environmental associations) breeds liking on an implicit level (Bornstein, 1989; Karpinski & Hilton, 2001). Thus, only quantity of contact with older people predicted implicit associations with them.

As previous studies found (e.g. Dasgupta & Greenwald, 2001), implicit associations with older people were more negative than explicit attitudes. As Olson and Fazio (2004) suggested, implicit associations may reflect negative *societal* associations concerning aging (automatically activated by our IAT), while explicit attitudes reflect consciously held, personally endorsed attitudes. The proportion of variance explained in implicit bias may seem low (7%), but in

previous research, using a range of mediators and predictors, we have found that contact explains a similarly low proportion of variance for some measures (e.g. perceived variability) but a much higher proportion of variance for explicit attitudes (Paolini et al., 2004; Voci & Hewstone, 2003). This study demonstrates the importance of contact quantity in relation to implicit bias. IAT scores did not correlate with explicit attitude ($r = -.01$). This replicates previous research results in which IAT scores did not correlate with explicit ageist attitudes against the elderly ($r = .08$) (Nosek et al., 2002). The distinction between implicit and explicit bias is shown in our study. In line with the environmental association model, quantity of contact with older people affects implicit associations—culturally shared, but not necessarily individually accepted, negative information about older people—on the implicit level. Quality of contact, on the other hand, affects explicit attitudes—personally endorsed feelings about older people as a whole.

Grandparent–grandchild communication and intergroup contact

This study is the first to simultaneously examine the attitudinal consequences of contact with older adults inside and outside the family, along with empathy and anxiety. The results in Figure 1 paint a picture of the dynamic between interpersonal (grandparent–grandchild) and intergroup (young-old) relations on the implicit and explicit level. Consistent with theory and previous research (e.g. Ensari & Miller, 2002), self-disclosure was accorded a central role in our model of the effects of contact on attitude toward the outgroup. We view self-disclosure as a specific form of quality of contact with grandparents. Results confirmed the importance of self-disclosure as a mediator of the impact of contact with the elderly on anxiety in grandparent–grandchild relations.

Quantity of contact with the elderly in general is associated with higher quality grandparent–grandchild communication and with more positive *implicit* associations with the elderly.

While the effect of quantity of contact on *explicit* attitude was mediated by anxiety and empathy with grandparents, quantity (but not quality) of contact had a direct effect on *implicit* associations. From mere exposure theory (Bornstein, 1989) and an environmental association model (Karpinski & Hilton, 2001), the exposure to an environment with more older people leads to more positive associations with them. More personal (and personalizing) intimate intergroup dimensions (i.e. self-disclosure, empathy, and anxiety with grandparents), however, did not mediate this effect (as it did for explicit attitudes). This appears to support the notion that the IAT reflects 'extrapersonal' environmental associations (Olson & Fazio, 2004). We suggest further research to examine the effects of contact on the 'personalized IAT' designed by Olson and Fazio (2004), which appears to eliminate extrapersonal associations and reflect the participants' personal evaluations of the target group. In the 'personalized IAT' participants categorize targets using the category labels 'I Like' and 'I Dislike' rather than 'Pleasant' and 'Unpleasant'. In this way, the IAT may assess participants' personal implicit attitudes rather than simple environmental or cultural associations of what's pleasant and unpleasant.

Alternative models and limitations

Although our hypothesized model fit the data well, there are always alternatives (MacCallum & Austin, 2000). We considered several options and rejected them on empirical or theoretical grounds. Although previous work is consistent with the idea that self-disclosure leads to empathy and reduced anxiety rather than vice versa (e.g. Aron et al., 2004; Gudykunst, 1995), we considered an alternative model in which the order between self-disclosure and the empathy-anxiety pair was reversed. In this model, contact with older people (1) has a direct effect on IAT scores, (2) quality of contact affects empathy and quantity of contact affects anxiety, (3) both of which, in turn, affect explicit attitudes via self-disclosure. This alternative model did not fit the data well: $\chi^2(13) = 41.90$, $p = .00$; RMSEA = .16; SRMR = .14; CFI = .63.

Models in which the causal sequence runs from prejudice to contact were also eliminated based on careful work, demonstrating that contact leads to prejudice reduction more strongly than vice versa (Herek & Capitanio, 1996; Pettigrew & Tropp, 2000). We did not test models in which empathy predicted lowered anxiety, or in which anxiety predicted empathy; both directions are plausible, and so we assessed them at the same level in our model.

As Ensari and Miller (2002) suggest, we view self-disclosure as a more specific form of quality of contact. Thus, we did not assess general contact with grandparents explicitly because we measured specific manifestations of it. That is, self-disclosure, anxiety, and empathy with grandparents would all be so highly correlated with a generic 'quality of contact with grandparents' measure that it would be inappropriate and tautological to include them in the same model. We also considered assessing self-disclosure, empathy, and anxiety with older people in general. It is likely, however, that young people have very limited levels of such experiences with older people in general (Williams & Giles, 1996). The grandparent-grandchild relationship has much more potential for the specific communicative and affective experiences vital for mediating the effects of contact on prejudice (Brown & Hewstone, 2005).

That said, we acknowledge that our data are cross-sectional and alternative models can exist simultaneously. As we have only a small sample size ($N = 77$), further research is needed to replicate these effects and examine further complexities (e.g. examining mediated moderation is not possible with our small sample). Furthermore, participants responding to questions about grandparents and the elderly in the same questionnaire may produce artificially high generalizability; grandparents and elderly may seem conceptually closer during the study than they would normally be. Future research may want to separate these concepts more markedly.

Conclusion and future directions

Contact with grandparents (particularly when involving self-disclosure) may be more personalized (Miller, 2002) than contact with other

older people, and may reflect a shared family identity rather than age group differences (Soliz & Harwood, in press). Such contact may thus lead to subtyping of the grandparents, and the contact may not generalize to attitudes toward all older people as easily as contact with older people outside the family. Although grandparents are in a different group (older people), they are also in the same group (family). This may facilitate generalization in ways that would be much less likely to occur with other intergroup divisions (e.g. race). Furthermore, age is a permeable boundary. Young people (with a little luck) will become old people. Thus, perhaps it is easier to empathize with grandparents (in the same family) and older people (which young people will one day become) than other groups. Future research should examine the differences between such groups. Future research might also examine the role of group salience in generalizing the effects of contact to attitudes on the *implicit* level.

This study draws together various lines of research (e.g. contact hypothesis, implicit measures of social cognition, communication) to investigate ageism. Self-disclosure is one of a host of communication variables that can be sensibly considered as crucial to intergroup processes involved in contact experiences (Harwood & Giles, 2005). Future research might also look at trait-based measures of communication competence (Greene & Burleson, 2003) and painful (or negative) self-disclosure. More competent communicators might be expected to experience lower anxiety and be able to devote more cognitive resources to managing quality intergroup interactions, thus enhancing the possibility of positive attitude change on the implicit as well as the explicit level. Likewise, examination of intergroup social support has great potential. Social support processes have been shown to predict interpersonal solidarity, trust, and quality relationships (Pierce, Sarason, & Sarason, 1996). The extent to which social support is offered and received from outgroup members has not been examined and is likely to yield powerful outcomes from contact. We see a promising future for the joint examination of

psychological and communicative phenomena in intergroup contact.

Notes

1. Only one participant was unable to recall any self-disclosure. She then reported a score of 2 on emotional empathy and a score of 4 on cognitive empathy, or perspective-taking. These scores were included in the analysis.
2. We also conducted this analysis using multiple regression; these results paralleled our SEM analysis.
3. Baron and Kenny (1986) suggest when there is a mediational effect, there should be a significant relationship (1) between independent variable and mediator, and (2) between mediator and dependent variable, controlling for the independent variable. (3) The effect of the independent variable should be reduced when the mediator is controlled for, when there is a mediational effect. Step 1 is shown in the correlation matrix (Table 1), Step 2 is shown in the model (Figure 1), and Step 3 is shown in Table 2. MacKinnon et al. (2002) indicate that there need not be a significant relationship between independent variable and dependent variable to establish mediation.

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