

Intergenerational Potential: Effects of Social Interaction Between Older Adults and Adolescents

Eva-Marie Kessler and Ursula M. Staudinger
Jacobs University Bremen

The present study aimed to investigate the potentially facilitative effect of the interaction between older adults and adolescents. For older adults, the interaction was expected to compensate for age-related deficits (e.g., cognitive performance, cognitive-affective complexity). In case of the adolescents, an optimization of development was expected (e.g., prosocial behavior, communion goals). Ninety older women (70–74 years) and 90 adolescent girls (14–15 years) were randomly assigned to 3 experimental conditions. In each of the conditions, nonfamiliar dyads collaborated on 1 task. The conditions varied according to the age composition and the type of contextual demand (high vs. low support of generativity [older adults] and identity formation [adolescents]). Individual performance measures were assessed immediately after the interaction. As expected, intergenerational settings characterized by high support of generativity and identity formation resulted in more prosocial behavior in adolescents. Furthermore, the results lent partial support to the hypothesis that in older adults, this setting facilitated higher complexity of emotion regulation as well as higher levels of performance in measures of speed and word fluency.

Keywords: collaboration, generativity, identity formation, intergenerational relationships, interactive minds

There is a long history to the investigation of social contexts on microgenetic and ontogenetic processes (e.g., Mead, 1913; Piaget, 1932; Vygotsky, 1978). This tradition has recently been revived by research on interactive minds and collaboration (e.g., Gould & Dixon, 1993; Staudinger & Baltes, 1996), social-cognitive paradigms in social psychology (e.g., Hess, Auman, Colcombe, & Rahhal, 2003; Hess, Rosenberg, & Waters, 2001), and social-cognitive paradigms in personality research (e.g., Berk & Andersen, 2000; Fitzsimons & Bargh, 2003). Two aspects, however, may have been understudied: (a) the systematic variation of the age composition and (b) the simultaneous consideration of interactional effects on *both* partners. In particular, the effects of interaction between members of different generations have been understudied. Therefore, the goal of the present study was to investigate the effects of intergenerational interaction on psychological functioning of both partners. In particular, we chose to investigate the interaction between older people and adolescents

because developmental theory and research suggests that the interaction between the grandparent and the grandchildren generation (i.e., G1–G3 interaction) is particularly interesting and potentially resourceful. A kin and a nonkin type of G1–G3 interactions are to be distinguished. In the present article, we focus on intergenerational relations outside the family. Whereas the study of grandparenthood has quite a long history (Smith, 1991; Szinovacz, 1998), there is very little systematic research on intergenerational relationships outside of the family (Kessler & Staudinger, 2007).

On the basis of a working model about the psychological effects of the interaction between older adults and adolescents, we conceptualized the G1–G3 interaction as a complex interplay between age-related motivational concerns on the one hand and contextual demands of the situation on the other hand. The central assumption was that G1–G3 interactions have the potential to facilitate psychological functioning both in adolescence and old age. They do so by compensating for well-documented deficits in the realm of cognitive functioning and emotion regulation in old age (i.e., cognitive performance, cognitive-affective complexity, e.g., Labouvie-Vief & Medler, 2002; Schaie, 2005) and by “accelerating” social development in adolescence (i.e., prosocial behavior and communion goals, e.g., Diehl, Owen, & Youngblade, 2004; Midlarsky & Hannah, 1989).

Eva-Marie Kessler and Ursula M. Staudinger, Jacobs Center for the Study of Lifelong Learning and Institutional Development, Jacobs University Bremen (formerly International University Bremen), Bremen, Germany.

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Correspondence concerning this article should be addressed to Eva-Marie Kessler or Ursula M. Staudinger, Jacobs Center for the Study of Lifelong Learning, Jacobs University Bremen, Bremen, Germany. E-mail: e.kessler@jacobs-university.de or staudinger@jacobs-university.de

Applied Research on Intergenerational Relations

Research on old-age educational intervention programs and intergenerational programs has explicitly addressed the effects of intergenerational interaction (e.g., Bales, Eklund, & Siffin, 2000; Meshel & McGlynn, 2004, for a review of recent publications). However, this research often lacks methodological rigor and mostly remains atheoretical (Kessler & Staudinger, 2007). Alto-

gether, these studies have suggested that intergenerational contexts increase positive affect, self-esteem, and life satisfaction of the participating older adults. This was the case, in particular when older people's authority and advisory status has been made pivotal (e.g., Kinnevy & Morrow-Howell, 1999). Some studies suggest that G1–G3 interactions stimulate cognitive functioning in older adults. In one study, for instance, older people were asked by the young nursing staff to comment on ethical issues (e.g., Kohlberg dilemma, war). It turned out that even patients with mild dementia seemed to be able to understand the hypothetical situations and to provide some advice (Müller, 1993). Evaluating the effects of volunteering in an intergenerational school program demonstrated that older volunteers' everyday memory functioning and positive mood increased from pretest to posttest (Newman, Karip, & Faux, 1995). With regard to adolescents, intergenerational programs were almost exclusively evaluated in terms of their reduction of negative age stereotypes (Fox & Giles, 1993, for an overview). Therefore, these studies do not contribute to a broader picture of the effects of G1–G3 interactions on adolescents.

Intergenerational Potential

When we turn to theory-based, well-controlled research, impressive evidence for the potential of intergenerational interactions has been provided by a recent study on older people's recall performance as a function of the listener's age (Adams, Smith, Pasupathi, & Vitolo, 2002). Each participant was instructed to learn a story (a fable, a Sufi teaching tale) and to retell it from memory to either a child or the adult experimenter. Older women demonstrated better propositional recall in the child-as-listener condition. In this condition, older women recalled even as much propositional content as younger participants. The authors attribute this finding to the older women's greater motivation to learn in the child-as-listener-condition. A study by Mergler, Faust, and Goldstein (1985) offers complementary results for the young interaction partner. In this study, taped prose passages (descriptive or narrative text) read by college students, middle-aged, or older tellers were orally recalled by college students in an incidental memory paradigm. The students remembered more story units when the narrative text was read by an older person. Both findings are consistent with social-cognitive research that has demonstrated that the meaning attached to a situation heavily influences the extent to which a person is willing to engage his or her (limited) cognitive resources (Hess, 1999; Hess et al., 2001). Obviously, both older and young perceive the transfer of experiential knowledge as a highly meaningful situation in which it is "worthwhile" to invest cognitive resources. From an evolutionary perspective, it has even been argued that the observed cognitive advantages of the G1–G3 interaction with regard to transmitting sociocultural knowledge and information are linked to the survival of the offspring (Mergler & Goldstein, 1983). Integrating these different pieces of evidence, it seems that G1–G3 interactions can have positive effects for both older and young interaction partners. These facilitative effects seem to be linked to intergenerational exchanges that support older adults' role as advice givers and conveyors of experience. However, for the facilitation to take effect, it has to be made sure that no negative age stereotypes are activated before or during the interaction. Recent social-cognitive research has demonstrated that the activation of negative age

stereotypes may have debilitating effects for older adults. In these studies, priming older people with the senility age stereotype led to lower levels of functioning in different domains of psychological and physical functioning, for example, in the domain of motor behavior (Hausdorff, Levy, & Wei, 1999), physiological reactions (Levy, Hausdorff, Hencke, & Wei, 2000), intellectual performance, and attitudes toward aging (Hess et al., 2003; Levy, 1996).

A Working Model of G1–G3 Interaction

On the basis of the research described above, we developed a working model of intergenerational interaction that describes the general psychological processes underlying the G1–G3 interaction. The model distinguishes two tiers of influences: the motivational tier and the tier of contextual demands. The motivational tier (Tier 1) represents the core of our model. We assume that there is a positive and favorable motivational basis underlying G1–G3 interactions that has a facilitating effect on old-age deficits, such as cognitive performance and cognitive-affective complexity, as well as on adolescents' weaknesses, such as prosocial behavior and communion goals. The facilitative effect is assumed to be due to the *activation of respective motivational concerns* (McAdams & de St. Aubin, 1992) that older adults and adolescents bring to the interaction. Age-related motivational concerns are very well described in Erikson's model of psychosocial phases as the interplay between inner needs or drives and external forces in society (Erikson, 1963). According to Erikson and other authors, generativity is a central motivational concern in old age (Erikson, Erikson, & Kivnick, 1986; Lang & Baltes, 1997) that includes a concern for transmitting life experience to the young generation (Kotre, 1984; McAdams, 2001). Generativity finds its motivational sources in the desire to do something that transcends one's own death as well as in societal expectations concerning older adults' devotion of increasing personal resources toward the caring for the young generation (McAdams & de St. Aubin, 1992). When it comes to adolescence, identity formation is regarded as the central motivational concern. It refers to developing a sense of personal meaning and direction (Erikson, 1959). Identity formation is expressed in the striving for knowledge about the self and the world in order to form an identity and to be able to cope with future challenges (e.g., Carstensen, 1992; Marcia, 1980). The motivational sources of identity formation lie in the interplay between physical and cognitive maturation and the societal expectation to take responsibility for oneself and others. We argue that generativity and identity formation are complementary motivational concerns that together constitute the G1–G3 motivational pattern.

We do not assume, however, that this powerful and favorable motivational pattern is realized in every G1–G3 interaction. For this powerful motivational pattern to be realized, it is necessary that contextual demands (Tier 2) are such that the older person can pass on life experience, and, in turn, curiosity and attentiveness is stimulated in the adolescents (i.e., generativity-identity context). Only if the contextual demands ask for the transmission of life experience and thereby assign an expert status to the older person, then the model predicts that generativity is activated in the older person and she or he consequently experiences a feeling of expanding and asserting the self as well as of caring for and devoting himself or herself to the adolescent. In the generativity literature, these two aspects of generativity have been referred to as the

agentive and communal part of generativity, respectively (Kotre, 1984; McAdams, Hart, & Maruna, 1998). We assumed that the activation of these two aspects of generativity is related with an activation of cognitive resources as well as with the promotion of a nonrepressive and self-assured attitude that allows for higher complexity of emotion regulation to occur.

In adolescents, in turn, generativity-identity contexts stimulate interest in and attention for the older person on the basis of their search for information about the self and the world. As a consequence of observing the older person's display of caring and other-oriented behavior, we predict an increase in adolescents' prosocial behavior and communion goals. However, if the contextual demands are such that the expert status is assigned to the adolescent and the older adults are therefore less likely to be able to pass on their experience, then no facilitating effects are expected.

Within the contextual tier, the model also takes into consideration that stereotypes about older people and aging are activated both in adolescents and older people themselves and influence the G1–G3 interaction. The activation of stereotypes is strongest when interaction partners are unfamiliar with each other (e.g., Fiske & Neuberg, 1990). This applies not only to the adolescent's perception of the older persons ("other stereotypes") but also to persons' self-perception ("self-stereotype"). According to Hummert's model of intergenerational communication (Hummert, 1994), the context of an interaction determines whether a positive or negative old-age stereotype is activated. That is, contextual demands can make old age salient in a positive or a negative way. For example, situations that assign an expert status to older adults are expected to trigger a positive old-age stereotype (both in young and older). Thus, those situations are assumed to support the activation of the G1–G3 motivational pattern. In contrast, contextual demands that stress older people's deficiencies (e.g., when it comes to tasks that require knowledge about modern technologies) are expected to activate a negative old-age stereotype that counteracts the activation of generativity and the realization of the G1–G3 motivational pattern.¹ Our predictions are illustrated in Figure 1.

Experimental Design and Hypotheses

The hypothesized facilitation effect was tested in an experimental lab study that systematically varied two factors, namely, (a) the age composition of the interaction partners and (b) situational support for the generativity-identity motivational pattern by varying the older person's expert status and the adolescent's interest. The latter factor was varied by means of the collaborative task. A difficult life problem was expected to assign the expert status to older adults, and a new media problem assigned the expert status to the adolescent (see the Method section). In the experimental condition, the interaction partners were from different generations (G1 and G3), and the contextual demand assigned the expert status to the older person ("old-young, life problem" [OY-LP]). We assumed that if at least one of these two factors, that is, old-young dyad or difficult life problem, was not given, then the G1–G3 motivational pattern would not be realized and therefore no facilitation would take place. Consequently, the design encompassed two control conditions. In the first control condition, the interaction partners belonged to different generations, but the task was a media problem that assigned the expert status to the adolescent

("old-young, media problem" [OY-MP]). In the second control condition, the interaction partners belonged to the same generation (older or adolescent peers), and the task was a difficult life problem ("peer control condition": "old-old, life problem" [OO-LP]; "young-young, life problem" [YY-LP]).

For each age group, the effects of the interaction were tested on the basis of two a priori hypotheses. For the adolescents, we expected adolescents to show more prosocial behavior and expose more communion goals in the OY-LP condition than adolescents in the first (OY-MP) and the second control condition (YY-LP). We expected the older adults to show higher levels of cognitive functioning and of cognitive-affective complexity in the OY-LP condition than in the first and second control conditions.

Method

Participants

For this first study, we decided to limit the sample to one gender only in order to keep the sample size manageable. There were 180 women who participated in this study, 90 older women, aged 70–74 years, and 90 girls, aged 14–15 years. The decision to limit the sample to women (and not to men) was primarily pragmatic. The population of older women is larger than that of older men due to higher life expectancy; furthermore, it is generally easier to recruit women because they have higher participation rates in psychological studies. We recruited the older participants through newspaper articles that described life span research (i.e., without mentioning the purpose of the study). The adolescents were recruited from the 8th, 9th, and 10th grades of the Gymnasium (school track with the highest level of education in Germany). In total, students from 27 school classes and 7 Bremen schools participated in the study.

Sociodemographic and psychological questionnaires were filled in at home after the testing session. We did this as a precaution to avoid a biased assessment because of interference between these variables and the intervention effect. This procedure resulted in the drop out of 2 older participants (2%) and 11 adolescents (12%). On average, older participants had 12.7 years of formal education ($SD = 3.65$). The older sample included a wide cross-section of women ranging from former business owners, civil servants, farmers, housewives, part-time workers, to blue- and white-collar workers, etc. Of the sample, 21% had a university degree. On a 5-point scale, the mean life satisfaction rating within the older sample was 4.1 ($SD = 0.80$). With regard to self-reported physical health, the old-age sample mean was 3.6 on a 5-point scale ($SD = 0.84$). In

¹ We did not consider "a young-age stereotype" in our model because to our knowledge, there is no empirical evidence as to the effects of its activation. Social-cognitive research has extensively studied the effects of old-age stereotypes, but not those of their counterparts at younger ages. Even more important, the very few studies that have addressed the investigation of "young-age stereotypes" have provided evidence that adolescence/young adulthood is not a category that is as equally salient as the old-age stereotypes (probably as, at least until recently, adolescents and young adults clearly presented the societal majority). Rather, older adults' mental representations of and judgments about adolescents appear to be neither strongly negative nor strongly positive, but rather neutral and balanced (Matheson, Collins, & Kuehne, 2000; Pinquart & Schoenbrodt, 1997).

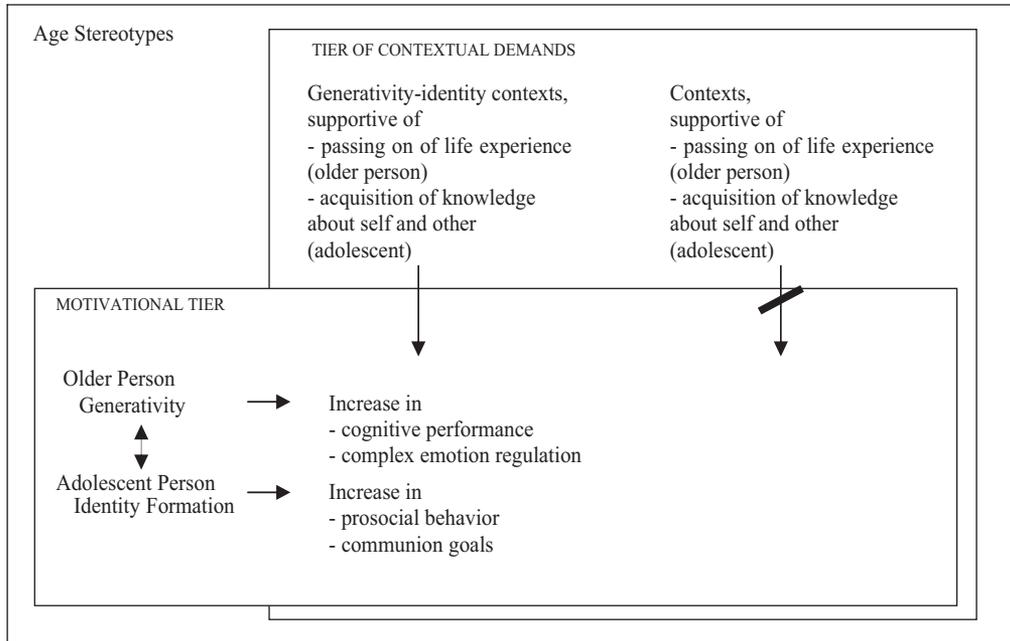


Figure 1. Illustration of the hypotheses underlying the study.

self-reports on the Neuroticism scale of the German version of the NEO Five-Factor Inventory (Borkenau & Ostendorf, 1989), older participants were in the normal, healthy range for their age ($M = 2.3$, $SD = 0.62$). For the adolescents, the sample mean of life satisfaction was 3.7 ($SD = 0.99$) on a 5-point scale. With regard to neuroticism, the sample mean was 2.82 ($SD = 0.63$). The differences between older adults and adolescents in life satisfaction and neuroticism are fully in line with the literature on personality development.

Within each age group, participants were randomly assigned to one of the three conditions. A quite complex recruitment strategy ensured that the participants of each dyad did not know each other, resulting in 90 “artificial” pairs. The introduction to the project did neither reveal the topic or the testing procedure of the project nor that participants would meet another person of another age. When participants came to the lab, the only information they received was that they would be asked about their “general attitudes and opinions about daily life.” Including people above the age of 70 ensured that older participants’ physical appearance was visibly beyond middle adulthood. Simultaneously, the age range of the adolescent participants was chosen to ensure that their physical appearance was clearly different from that of young adults so that they were clearly recognizable as members of the G3 generation. All participants received 10 Euro (about \$14 U.S.) for participation.

Randomization Check

Randomized assignment of participants was of special importance in this study as it was not possible to realize both a between-subject design and a within-subject design because of potential carryover effects resulting from the baseline assessment. Specifically, cognitive measures have been shown to easily activate

negative age stereotypes in older adults (e.g., Rahhal, Hasher, & Colcombe, 2001). Therefore, assessing cognitive performance at baseline may have activated the negative self-stereotype of the senile old person that might have influenced the subsequent interaction and counteracted the facilitative effect both in older and adolescent participants. Furthermore, there are clear limitations to the validity of repeated assessments of prosocial behavior within a very short period of time, even if parallel forms are available. Engaging in prosocial behavior at Time 1 [T1] makes a person less willing to behave in a prosocial manner at Time 2 [T2] because of limited personal resources. With regard to cognitive-affective complexity, we know from experience in our lab that open-ended emotion measures elicit emotions that remain active beyond the actual time of assessment. Again, such emotional transfer would have compromised the experimental setup of the subsequent social interaction. Thus, the baseline assessment would have been an intervention in its own right. Therefore, we decided against the repeated design and rather invested in controlling for the success of the randomization procedure.

Randomization of individuals. Analyses of variance (ANOVAs) and chi-square tests showed that the three subsamples of both the older and the adolescent participants did not differ in terms of demographic characteristics (age, years of education) or of central psychological variables (life satisfaction, Neuroticism, Openness to New Experience, Agreeableness, Conscientiousness, Extraversion; see Table 1). Furthermore, the older subsamples in the two intergenerational conditions (OY-LP, OY-MP) did not differ in any of three types of intergenerational contact (chi-square according to Fisher’s exact tests for small contingency tables): grandchildren, $\chi^2(1, N = 53) = 2.65$, *ns*; relatives and friends, $\chi^2(1, N = 47) = 6.29$, *ns*; people outside family, $\chi^2(N = 52) = 6.07$, *ns*. Furthermore, the adolescent subsamples in the intergen-

Table 1
Randomization Checks: Sociodemographic and Psychological Variables per Experimental Condition

Characteristic	Total		Old-young, Life problem		Old-young, Media problem		Peer, Life problem		Total: <i>F</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Age									
Older (<i>n</i> = 90)	71.83	1.39	71.80	1.42	71.70	1.37	72.00	1.41	<i>F</i> (2, 87) = 0.36, <i>ns</i>
Young (<i>n</i> = 90)	14.52	0.49	14.60	0.50	14.50	0.51	14.47	0.50	<i>F</i> (2, 87) = 0.57, <i>ns</i>
Years of education									
Older (<i>n</i> = 85)	12.35	3.76	12.08	3.89	13.50	3.28	12.67	3.65	<i>F</i> (2, 82) = 1.24, <i>ns</i>
Young (<i>n</i> = 90)	8.90	0.91	9.10	0.91	9.07	0.91	9.02	0.91	<i>F</i> (2, 87) = 0.25, <i>ns</i>
Neuroticism									
Older (<i>n</i> = 86)	2.29	0.62	2.19	0.64	2.20	0.36	2.48	0.78	<i>F</i> (2, 83) = 1.98, <i>ns</i>
Young (<i>n</i> = 79)	2.82	0.63	2.79	0.58	2.94	0.72	2.74	0.58	<i>F</i> (2, 76) = 0.72, <i>ns</i>
Openness to Experience									
Older (<i>n</i> = 86)	3.76	0.51	3.89	0.43	3.67	0.50	3.72	0.58	<i>F</i> (2, 83) = 1.53, <i>ns</i>
Young (<i>n</i> = 79)	3.37	0.58	3.47	0.62	3.29	0.59	3.35	0.55	<i>F</i> (2, 76) = 0.65, <i>ns</i>
Conscientiousness									
Older (<i>n</i> = 86)	3.97	0.47	3.90	0.51	3.97	0.47	4.03	0.46	<i>F</i> (2, 83) = 0.53, <i>ns</i>
Young (<i>n</i> = 79)	3.64	0.57	3.78	0.57	3.42	0.52	3.71	0.58	<i>F</i> (2, 76) = 2.96, <i>ns</i>
Agreeableness									
Older (<i>n</i> = 86)	3.98	0.37	4.09	0.36	3.98	0.37	3.87	0.37	<i>F</i> (2, 83) = 2.57, <i>ns</i>
Young (<i>n</i> = 79)	3.58	0.48	3.62	0.50	3.51	0.43	3.59	0.53	<i>F</i> (2, 76) = 0.33, <i>ns</i>
Extraversion									
Older (<i>n</i> = 86)	3.29	0.46	3.36	0.49	3.31	0.44	3.21	0.46	<i>F</i> (2, 83) = 0.77, <i>ns</i>
Young (<i>n</i> = 79)	3.65	0.52	3.71	0.54	3.66	0.56	3.60	0.47	<i>F</i> (2, 76) = 0.25, <i>ns</i>
Life satisfaction									
Older (<i>n</i> = 87)	4.11	0.80	4.14	0.69	4.21	0.77	4.00	0.93	<i>F</i> (2, 84) = 0.50, <i>ns</i>
Young (<i>n</i> = 90)	3.70	0.99	3.80	0.96	3.77	0.94	3.53	1.07	<i>F</i> (2, 87) = 0.64, <i>ns</i>

Note. Smaller sample sizes were due to missing data (see the Method section). *ns* = nonsignificant at $p < .05$ level.

erational conditions also did not differ with regard to how frequently they had contact with their grandparents and with older people outside family: grandparents, $\chi^2(1, N = 49) = 6.84, ns$; people outside family, $\chi^2(N = 49) = 3.95, ns$. However, the adolescent participants in the experimental condition were more frequently in contact with older relatives and friends than adolescent participants in the OY-MP condition, $\chi^2(1, N = 49) = 9.47, p \leq .05$; see the Results section for discussion.

Randomization of dyads. We also tested whether the ceteris-paribus condition was realized with regard to the dyads. This means that the success of randomization was also tested using the old-young dyads of the OY-LP, OY-MP conditions as units of analysis. For this purpose, each interaction partner was classified as scoring low or high (as compared with the mean of their respective age group) on variables that may influence dyadic constellations (Openness to New Experience, Agreeableness, Extraversion, Neuroticism, and frequency of contact with the older/younger generation). This resulted in four alternative constellations per intergenerational dyad (low/low; high/high; low/high; high/low). For both age groups, chi-square tests showed that the two subsamples of old-young dyads did not differ with regard to the frequency of any of the four possible dyadic constellations: Neuroticism, $\chi^2(3, N = 49) = 0.23, ns$; Agreeableness, $\chi^2(3, N = 48) = 3.36, ns$; Openness to New Experience, $\chi^2(3, N = 49) = 3.38, ns$; Extraversion, $\chi^2(3, N = 49) = 1.34, ns$; Frequency of intergenerational contact: chi-square according to Fisher's exact tests for small contingency tables: within family, $\chi^2(N = 47) = 7.05, ns$; relatives and friends, $\chi^2(N = 47) = 1.34, ns$; people outside family, $\chi^2(N = 47) = 6.29, ns$.

Experimental Conditions

In all conditions, dyads worked on the respective task for 20 min. Both in OY-LP and the peer control conditions (OO-LP/YY-LP), the interaction partners had to work on a difficult life problem. The problem text describes a fictitious person who realizes that she or he has not accomplished in life what she or he once set out for (see the Appendix). Taken from the Berlin Wisdom paradigm (Staudinger & Baltes, 1996), this scenario has been shown to be an ecologically relevant and functional interactive-minds setting for the assessment of wisdom-related performance (Staudinger & Baltes, 1996). In the present study, participants were instructed to elaborate on ideas about what they would recommend to the fictitious person. Recent work has shown that adults achieve higher levels of performance on this task than adolescents (Pasupathi, Staudinger, & Baltes, 2001). In the peer control condition, the collaborative task was a fictitious media problem that was of similar structure and length. The task was to elaborate on ideas about what participants would recommend to a TV maker producer who plans to produce a show targeted to teenagers (see the Appendix). A pilot study had demonstrated that adolescents feel that they have a lot of knowledge to offer when it comes to this task; in a complementary fashion, older participants mostly regarded adolescents as experts in this task.

Materials

Prosocial behavior (adolescents). Prosocial behavior was one of the outcome measures for the adolescent sample, as it represents

a domain of functioning that is not yet well developed in adolescents (e.g., Midlarsky & Hannah, 1989; van Lange, de Bruin, Otten, & Joireman, 1997). To obtain a change-sensitive measure, we selected a paradigm usually applied in experimental settings with children and adolescents (e.g., Knight, Johnson, Carlo, & Eisenberg, 1994; Miller, Eisenberg, Fabes, & Shell, 1996). Such paradigms typically assess children's helping behavior in reaction to a cover story. Typically, films or letters are presented that describe a fictitious target person who is in need of help. In the present study, adolescent participants read an announcement letter of an alleged non-profit organization that recruits teenage volunteers who support ill children and teenagers in the hospital. The dependent variable was whether participants volunteered to help such a person by writing e-mails, letters, text messaging, or phoning them. The participants could choose among two options (volunteer or not). To minimize the effects of social desirability during decision making, the experimenter left the room by pretending that she forgot something that she needed to get. If participants agreed to volunteer, then they had to write down their name and address on a sheet of paper and throw it into a box. In order to avoid that the measurement was confounded by intraindividual differences in how competently and confidently participants felt about helping (cf. Barnett, Thompson, & Schroff, 1987), the letter describing the project stressed that no special skills or prior knowledge were required in order to be able to help.

Communion goals (adolescents). Communion goals were selected as a second outcome domain because no balance between agency and communion goals or related self-conceptions has been achieved yet in adolescence. Rather, there is an overemphasis on agency to be observed in adolescence (e.g., Diehl et al., 2004). Communion goals in adolescents were assessed on the basis of seven goal-related sentence stems (e.g., "In the course of the next years . . .") that are part of the sentence completion task developed by Dittmann-Kohli (1995).² These sentence stems have been shown to tap into people's wishes, intentions, and goals. The measure has been used with adolescents before. The sentence completions were coded as to whether they are primarily oriented toward oneself or others (Dittmann-Kohli, 1995). Participants were instructed to spontaneously complete the sentence stems within 10 min. The coding of answers encompassed two steps. In a first step, a trained rater divided sentence completions into coding units. A *coding unit* was defined to be constituted by a goal. To check the reliability of the segmentation, a second person segmented 10% of the protocols. The interrater reliability was $\kappa = .99$. This reliability was considered highly satisfactory. Thus, the segmentations of the first rater were accepted. In a second step, two independent raters, who were trained extensively on the basis of a manual, categorized the coding units according to communal or agentic content.³ The definition of agentic and communal content was based on the definitions by Saragovi, Koestner, Di Dio, and Aubé (1997). The *agentic category* was defined as expressing a focus on the self and on forming separations, including self-protection, self-assertion, self-expansion, self-control, and self-direction (e.g., "The most important thing for me is that . . . I'll get a prestigious and well-paid job."). The *communal category* was defined as expressing a focus on others and forming connections, including group participation, cooperation, and attachment (e.g., "The most important thing for me is that . . . my family and I can always live together.").⁴ The interrater reliability was $\kappa = .79$.

Inconsistencies were resolved through discussion until consensus was reached. The ratio of the number of communal coding units to the number of agentic coding units formed the final score.

Cognitive-affective complexity (older adults). Cognitive-affective complexity was selected as an area of functioning that has been shown to be deficient in older adults (Labouvie-Vief & Medler, 2002). *Cognitive-affective complexity* is defined as the ability to view events and persons in an open, tolerant, and complex fashion by focusing on the negative as well as the positive side of the self and others (Labouvie-Vief & Medler, 2002; Loevinger, 1976; Noam, 1998). It was assessed on the basis of participants' spontaneous ideas in reaction to an ambiguous text. The development of the measure followed the assessment paradigm suggested by Labouvie-Vief (Labouvie-Vief, Chiodo, Goguen, Diehl, & Orwoll, 1995; Labouvie-Vief & Medler, 2002).⁵ The ambiguous text consisted of a short statement that described an older woman who finds herself in a town where she has never been before. Subsequently, participants were asked to take 5 min to write down answers to three questions concerning that scenario (How may the woman have come to this town? What may she be doing there? What may the woman feel and think?). Two independent judges rated the responses on a 4-point Likert scale ranging from 1 (*uniformly positive or negative*) to 4 (*complex and multivalent*). Raters were trained and calibrated according to a manual.⁶ The interrater reliability was highly satisfactory (Cronbach's $\alpha = .93$). The dependent variable was the degree of cognitive-affective complexity on a 4-point scale, ranging from 1 (*low complexity*) to 4 (*high complexity*). An answer was rated as "4" if the answers included multiple perspectives on how the woman came to the town and if both positive and negative feelings and thoughts were attributed to her. The Appendix lists an illustrative example of a high-level response.

Cognitive performance (older adults). Three facets of cognitive performance were selected because they have repeatedly been shown to demonstrate pronounced declines in later adulthood: speed, word fluency, and logical reasoning (e.g., Li, 2001; Schaie, 2005, for overviews).

On the basis of our working model, we hypothesized that triggering generativity in older adults would result in the activation of cognitive resources that, in particular, should facilitate performance on cognitive measures that are sensitive to motivational influences. We expected that this primarily applies to measures with a strong speed component such as our speed and fluency

² Sentence stems can be obtained from Eva-Marie Kessler upon request.

³ The rating manual can be obtained from Eva-Marie Kessler upon request.

⁴ The pattern of findings, as reported in the Results section, remains unchanged when the ratio of the number of communal coding units to the total number of segments was referred to as the outcome variable.

⁵ Labouvie-Vief and colleagues (1995; Labouvie-Vief & Medler, 2002) used a measure in which participants had to write a short paragraph about the self or the self in relation to her or his close social network. For the purpose of the present study, we modified the paradigm in order to make it change-sensitive by selecting a target that bore resemblance to the older participant and exhibited a high degree of ambiguity. The rating procedure used by Labouvie-Vief also encompasses a richer set of dimensions, as compared with this study.

⁶ The manual can be obtained from Eva-Marie Kessler upon request.

measure. Word fluency has been shown to reflect not only differences in semantic knowledge (e.g., the pragmatics) but also individual differences in speed and ease of information access (Salthouse, 1993). We did not expect that measures of logical reasoning that more strongly depend on coordinative processing (Mayr & Kliegl, 1993) would profit from the generativity intervention. Comparing the three experimental conditions on the measure of logical reasoning therefore may also be considered as a quasibase-line comparison of cognitive functioning.

As mentioned above when discussing the choice of design, we aimed to minimize the risk that the cognitive assessment would activate a negative old-age stereotype that would undermine the intervention effect. From social-cognitive studies we know, for instance, that the language used to instruct intelligence tests easily activates the negative stereotype of the senile old person, thereby significantly debilitating older people's cognitive performance (Rahhal et al., 2001). Therefore, we modified test instructions such that "stereotype threat" (Steele & Aronson, 1995) was minimized. Specifically, test instructions deemphasized the achievement component of the task. Three practice items for speed and logical reasoning were administered before the test phase started.⁷

First, speed was measured using the Letter Comparison test (Salthouse & Babcock, 1991). Participants had 60 s in total to mark whether pairings of three, six, or nine letters were the same or different. Scoring was based on the total number of correct responses. Second, for the assessment of word fluency, participants had to name as many different words starting with the letter *s/S* as possible within 90 s (Lindenberger, Mayr, & Kliegl, 1993). Scoring was based on the total number of correct responses. Morphological variants and repetitions were excluded. All words starting with the letter *S*, including proper names, were counted as correct responses. Third, logical reasoning was measured by the "Letter Series test" (Lindenberger & Reischies, 1999). The test consists of 16 items. Each item contains five letters followed by a question mark (e.g., c e g i k?). Participants have to select the answer that correctly completes the order from a pool of five alternatives. The final score is the total number of correct responses.

Procedure

The 90-min sessions took place between 2.30 p.m. and 7 p.m. in the Behavioral Science Laboratory of the Jacobs University, Bremen, Germany (formerly International University Bremen). As daytime has been shown to influence psychological functioning (e.g., Yoon, May, & Hasher, 2000), the administration of the different experimental conditions were equally distributed across this time. The experimenters were two women, aged 28 and 30 years, respectively, who were extensively trained to follow a standardized script. After individual participants were welcomed, they were individually introduced to the collaboration task. Afterward, participants learned that they would collaborate on the task with another participant (adolescent or older). Furthermore, participants were instructed not to stray from the task during the 20 min of discussion time. Afterward, 2 participants met in one room and collaborated on one of two tasks (life problem, media problem) with no experimenter being present. A 10-min "warm-up" task always preceded the task. The warm-up task used in the OY-LP, OO-LP, and YY-LP conditions was another difficult life

problem taken from the Berlin Wisdom paradigm. The warm-up task used in the OY-MP condition was another media problem. The aim of the warm-up task was to introduce the participants to the format of the following task, the discussion mode, and to familiarize them with each other. Immediately after the discussion of the target problem, the two interaction partners were led to separate rooms, and individual performance measures were assessed. In order to avoid an experimenter bias, each of the two experimenters tested 50% of the adolescent and older participants in the experimental group. The measurement of adolescents' prosocial behavior always preceded the sentence completion task in order to make the cover story of that test work. Older participants worked on the cognitive tests and the cognitive-affective complexity measure in a balanced order. For the cognitive-affective complexity measure, a 3 (experimental group) \times 2 (testing order) between-subjects ANOVA was performed to test for sequence effects. Neither a main effect for testing order nor an interaction of testing order and experimental condition was found: testing order, $F(1, 83) = 0.30$, *ns*; Testing Order \times Experimental Condition, $F(2, 83) = 0.19$, *ns*. Using Wilks's lambda, a multivariate analysis of variance (MANOVA) revealed no sequence effects for the three cognitive measures: testing order, $F(3, 80) = 0.13$, *ns*; Testing Order \times Experimental Condition, $F(6, 160) = 1.46$, *ns*. After we had obtained the questionnaires completed at home, participants were extensively debriefed about the aims of the study.

Manipulation Check and Possible Confound

The validity of the experimental manipulation was checked in two ways: (a) video surveillance and (b) self-reported generative or identity-formation motivation. First, an experimenter observed the interaction via video in another room. In case participants strayed from the task, the experimenter intervened by means of a microphone, reorienting participants to the task.

Second, the participants were asked to complete self-report scales that assessed the degree to which they had experienced generative (older adults) and identity-formation motivation (adolescents), respectively, during the interaction. The Self-Report Generativity scale for the older participants consisted of four items (e.g., "I was able to pass on a lot to my conversational partner."); Cronbach's $\alpha = .75$; see also the Appendix). An ANOVA across the three conditions showed that older participants in the OY-LP condition scored more highly on the generativity scale than older participants in the control conditions ($M_{OY-LP} = 3.98$, $SD = 0.78$; $M_{OY-MP} = 2.87$, $SD = 0.87$; $M_{OO-LP} = 3.36$, $SD = 0.80$), $F(2, 86) = 13.86$, $p \leq .001$. Identity-formation motivation in adolescents was tested using a self-report exploration scale for the adolescent participants and consisted of three 5-point items (e.g., "I was keen on learning from the personal experiences of my conversational partner."); Cronbach's $\alpha = .62$; see also the Appendix). An ANOVA with a three-level factor representing three conditions showed that adolescent participants in the OY-LP condition scored more highly on the exploration scale than adolescent

⁷ Such modifications of the instructions have to be taken into consideration when comparing the present results with results from other studies that use standard instructions.

participants in the control conditions ($M_{OY-LP} = 3.49, SD = 0.82; M_{OY-MP} = 3.09, SD = 0.75; M_{YY-LP} = 2.94, SD = 0.67$), $F(2, 86) = 13.86, p \leq .05$.

Furthermore, immediately after the interaction, all participants were asked to rate to which degree they had experienced positive emotions during the interaction. Positive emotions were assessed as potential confounds, as there is evidence that positive emotions influence prosocial orientation (Isen, Shalcker, Clark, & Karp, 1978), cognitive functioning (see Isen, 2004, for an overview), and cognitive-affective complexity (Labouvie-Vief, 2003). Six positive emotion adjectives that are likely to occur during social interactions were chosen from the Positive and Negative Affect Schedule—Expanded Form (e.g., *alert, confident*; Watson & Clark, 1994). The reliability of the scale was Cronbach's $\alpha = .60$ for the older participants and Cronbach's $\alpha = .56$ for the adolescent participants. For both age groups, the three conditions did not differ (older sample: $M_{OY-LP} = 3.60, SD = 0.54; M_{OY-MP} = 3.65, SD = 0.59; M_{OO-LP} = 3.51, SD = 0.64$), $F(2, 84) = 0.44, ns$; (adolescent sample: $M_{OY-LP} = 3.52, SD = 0.53; M_{OY-MP} = 3.46, SD = 0.46; M_{YY-LP} = 3.57, SD = 0.59$); $F(2, 84) = 0.34, ns$. These results provide evidence that experimental effects cannot be attributed to differences in positive affect between the conditions.

Results

For each age group, the two hypotheses were tested using planned comparisons (OY-LP vs. OY-MP; OY-LP vs. OO/YY-LP).⁸

Prosocial Behavior (Adolescents)

As expected, significantly more adolescents in the OY-LP condition than in the OY-MP condition volunteered. Figure 2 illustrates that of the 30 participants in each condition, there were 24 volunteers in OY-LP (80%) in contrast to 13 volunteers in the OY-MP condition (43%), $\chi^2(1, N = 60) = 8.53, p \leq 0.01, \omega = 0.48$. Furthermore, in line with our hypothesis, significantly fewer adolescent participants in the YY-LP condition ($n = 10$) than in the OY-LP condition agreed to volunteer, $\chi^2(1, N = 60) = 13.3; p \leq .001, \omega = 0.63$. As prosocial behavior was not significantly correlated with the frequency of contact with older relatives and friends across the two conditions ($C = 2.81, ns$), this result was not biased by a priori differences on this dimension (as described in the Method section).

Communion Goals⁹ (Adolescents)

There were 1,225 coding units in total, of which 670 units (55%) were coded as agentic and 503 units (41%) as communion. Of the coding units, 4% did not fit either of these categories. Against our expectations, a planned comparison ANOVA showed there were no significant differences in the ratio of the number of communal coding units to the number of agentic coding units between the OY-LP and the OY-MP conditions ($M_{OY-LP} = 0.808, SD = 0.745; M_{OY-MP} = 0.864, SD = 0.707$), $F(1, 85) = 0.10, ns$. The planned comparison between the OY-LP and YY-LP conditions also failed to be significant ($M_{YY-LP} = 0.809, SD = 0.532$), $F(1, 85) = 0.00, ns$.

Cognitive-Affective Complexity (Older People)

The planned comparison between the OY-LP and OY-MP conditions showed that there was a trend that cognitive-affective complexity was higher in the OY-LP as compared with the OY-MP condition that approached significance ($M_{OY-LP} = 2.63, SD = 1.07; M_{OY-MP} = 2.21, SD = 1.05$), $F(1, 86) = 2.85, p \leq .10, \eta^2 = .032$. The older participants in the experimental condition tended to show a higher degree of cognitive-affective complexity in their written reactions to the ambiguous text material than the participants in the intergenerational control condition. Furthermore, older participants in the OY-LP condition scored significantly higher on the complexity measure than older participants in the OO-LP condition ($M_{OO-LP} = 1.70, SD = 0.84$), $F(1, 86) = 13.37, p \leq .001, \eta^2 = .135$. The results are illustrated in Figure 3.

Cognitive Performance¹⁰ (Older People)

Using Wilks's lambda, a MANOVA showed that the planned comparison between the OY-LP condition and the OY-MP condition was significant, $F(3, 83) = 2.92, p \leq .05$ (see Figure 4). Across the three indicators, older participants in the experimental condition scored more highly than participants in the intergenerational control condition. Univariate follow-up ANOVAs showed that, as expected, there was a significant effect for fluency ($M_{OY-LP} = 18.97, SD = 6.97; M_{OY-MP} = 15.27, SD = 6.49$), $F(1, 85) = 5.36, p \leq .05, \eta^2 = .059$, and an effect for speed that approached significance ($M_{OY-LP} = 12.25, SD = 2.49; M_{OY-MP} = 10.90, SD = 2.89$), $F(1, 85) = 3.19, p \leq .10, \eta^2 = .036$. Also in line with our hypothesis, the two conditions did not differ significantly in logical reasoning, which had been introduced as a quasi-baseline of cognitive functioning ($M_{OY-LP} = 7.79, SD = 3.45; M_{OY-MP} = 7.83, SD = 3.88$), $F(1, 85) = 0.00, ns$. Furthermore, a second analysis showed that the contrast between the OY-LP condition and the OO-LP condition was not significant, $F(3, 83) = 0.68, ns$. As expected, no significant difference in logical reasoning was found ($M_{OO-LP} = 7.87, SD = 3.29$), $F(1, 85) = 0.01, ns$. However, against our hypothesis, OY-LP and OO-LP did not differ in terms of speed and fluency (speed: $M_{OO-LP} = 12.70, SD = 3.19$), $F(1, 85) = 0.35, ns$ (fluency: $M_{OO-LP} = 16.97, SD = 4.58$); $F(1, 85) = 1.56, ns$. In summary, participants in the OY-LP condition outperformed participants in the OY-MP condition with regard to speed (trend) and word fluency, but not in the OO-LP condition. The three conditions did not differ in logical reasoning.

Violation of Independence of Observations

In the peer control conditions (OO-LP, YY-LP), the pairs discussed the collaboration task together before they were later tested

⁸ As the number of degrees of freedom does not exceed the number of planned comparisons, no adjustment of alpha was necessary (Tabachnick & Fidell, 2001).

⁹ For communion goals, 1 older participant in the OY-LP condition and 1 in the OY-MP condition were excluded from the analysis as outliers (cases with z scores in excess of 3.29; see Tabachnick & Fidell, 2001).

¹⁰ In the OY-LP condition, 1 participant was excluded from the study of logical reasoning, as she had misunderstood the task. In the same condition, another participant had to be excluded from the study of fluency, as the testing session was interrupted.

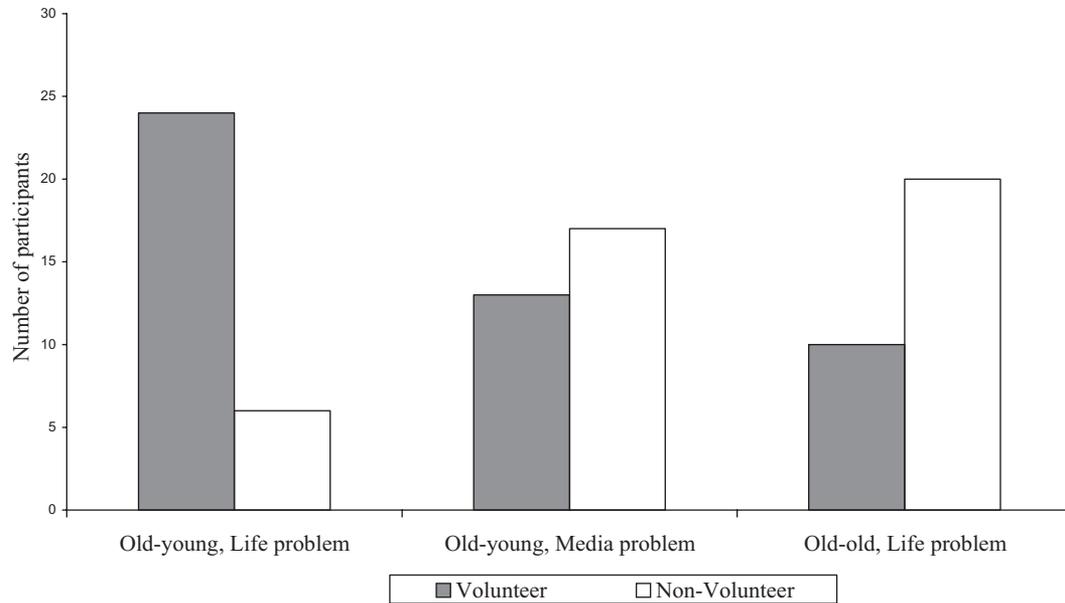


Figure 2. Number of adolescent participants who showed prosocial behavior across the three conditions.

individually on the same measures. This procedure may have resulted in a violation of the independence assumption, as the interaction partners were exposed to the same contextual influence (collaboration of 10 + 20 min) before the individual assessment (e.g., Kenny & Judd, 1986). To deal with this concern, we performed an additional repeated measures ANOVA. Considering the dyad as the unit of analysis, we tested whether introducing a within-subjects factors (i.e., position within the dyad) had an effect on the outcome variables. No effect was found for any of the dependent variables in the older sample: generativity, $F(1, 14) = 0.00$, *ns*; cognitive-affective complexity, $F(1, 14) = 0.07$, *ns*; speed, $F(1, 14) = 0.18$, *ns*; fluency, $F(1, 14) = 2.74$, *ns*; logical reasoning, $F(1, 14) = 3.02$, *ns*, as well as in the adolescent sample: exploration, $F(1, 14) = 0.01$, *ns*; communion goals, $F(1, 14) = 0.89$, *ns*.

Discussion

In the present study, we investigated whether the interaction between adolescents and older adults bears a potential to compensate for cognitive and cognitive-affective deficits in old age and to optimize prosocial behavior and communion goals in adolescence. For this purpose, we developed a working model of G1–G3 interactions (see Figure 1). The facilitating effect of G1–G3 interactions is assumed to be due to the activation of age-normative motivational concerns in older people (generativity) and in adolescents (identity formation). This activation, however, is dependent on certain contextual demands. The model was experimentally tested by manipulating the age composition and the type of contextual demand (high vs. low support of generativity and identity formation). Overall, the present study lends partial support to our hypotheses.

As reported above, the results of the manipulation checks are consistent with the interpretation that the observed effects are motivational in nature. As expected, after the interaction, partici-

pants in the OY-LP condition reported that they had experienced a higher degree of generativity (older participants) or identity formation (adolescents) than participants in the control conditions (OY-MP, OO-LP/YY-LP). We were also able to rule out the possibility that the observed effects are a result of the activation of positive affect during the interaction.

Realization of Intergenerational Potential in Adolescents

In line with the predictions of our model, adolescents who had worked with an older person on a difficult life problem (OY-LP) showed much more prosocial behavior than those who had worked with an older person on a media problem (OY-MP) or those who had worked with a peer on a difficult life problem (YY-LP). According to the working model introduced above, the activation of generativity in the older person is expressed in caring behavior and solidarity toward the adolescent. In a complementary fashion, the activation of identity formation is expressed in the adolescents' curiosity and attentiveness toward the older person in order to gather information about the self and the world. On the basis of the results and our working model, we can speculate that adolescents in the OY-LP condition develop a mental representation of social interaction as characterized by care and community.

We suggest that at least two types of processes (model learning, activation of existing communal person and relationship schemata) may lead to the resulting increase in prosocial behavior. First, adolescents in the OY-LP condition may have perceived their older discussion partners as models. Research on model learning demonstrates that children who observe helping models behave in a more prosocial manner afterwards than children who observe egoistic models (Eisenberg & Fabes, 1998, for an overview). Second, interpersonal social-cognitive theories argue that the activation of existing interpersonal schemata can evoke prosocial behavior. For example, in one study, thinking about a good friend increased participants' helping behavior (Fitzsimons & Bargh,

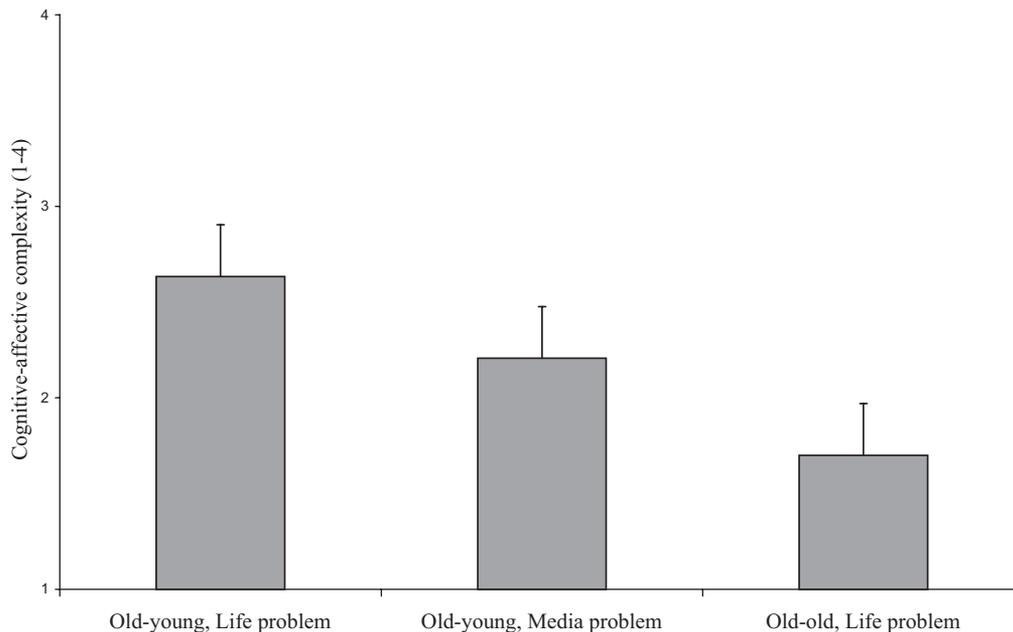


Figure 3. Mean levels (with standard errors) for cognitive-affective complexity (on a 4-point scale) across the three conditions.

2003). Against this theoretical background, the increase in prosocial behavior, as observed in the OY-LP condition, may be interpreted as the activation (not the creation) of communal relationship schemata that had been acquired earlier.

Our hypothesis with regard to communion goals was not supported. This may have been a method effect; that is, the way we assessed communion goals may have triggered stereotypic rather than recently activated thoughts. In adolescence, the prevalence of stereotypic future selves and concepts (Dittmann-Kohli, 1995) might “immunize” against situational effects. Thus, the administration of a projective test along the lines of the Thematic Apperception Test (TAT; Murray, 1943) may have been more successful. In other words, to find significant effects with our assessment method may require repeated exposure to intergenerational generativity over a longer period of time, and it may require adolescents’ conscious effort to transfer the generative experience to the level of self-conceptions (“high road transfer”; Salomon & Perkins, 1989).

Realization of Intergenerational Potential in Older Adults

Our study also showed that as expected, older participants who had worked with an adolescent on a difficult life problem (OY-LP) scored higher on word fluency than older participants who had worked with an adolescent on a media problem (OY-MP). There also was a trend ($p < .10$) for the speed measure in the same direction. This result is in line with our working model, which predicts that only intergenerational settings that allow for the transfer of life experience to the young generation result in cognitive stimulation. Furthermore, the results also confirmed our hypothesis that the stimulating effect has no consequences for logical reasoning, as this domain of fluid intelligence depends more strongly on coordinative processing than on speed (simulta-

neously storing and processing information; e.g., Mayr & Kliegl, 1993). Thus, the comparison of experimental subgroups on our measure of logical reasoning may serve as a quasibaseline comparison of cognitive functioning. This comparison suggests that subgroups did not differ a priori on cognitive functioning but that the experimental condition (OY-LP) succeeded in boosting cognitive performance. Our findings are in line with the results of the study by Adams and colleagues (2002), who showed that older people’s story-recall performance increased in contexts of oral transmission to children (i.e., generative context). In addition to the motivational boost related with the generativity experience, it is also possible and likely that the positive self-stereotype of the wise older person may have supported the cognitive activation related with generativity. For example, one study showed that priming older people with the wisdom-age stereotype led to an increase in memory performance (Levy, 1996). On the basis of the present data, we cannot disentangle motivational effects from additional effects resulting from the activation of positive old-age stereotypes. This is also the case with regard to the debilitation effect of a situational setting that assigns the expert status to the adolescent (OY-MP). This setting may not only suppress the emergence of the G1–G3 motivational pattern but also may trigger a negative old-age stereotype and upward social comparisons with the adolescent “expert.” Consequently, the relatively low level of performance in speed and fluency in the OY-MP condition may also have been a result of the activation of a negative old-age stereotype. However, the fact that the conditions did not differ significantly in logical reasoning clearly speak against the latter interpretation.

Against our expectation, the results also showed that older participants in the experimental condition (OY-LP) did not outperform participants in the peer condition (OO-LP) on the speed

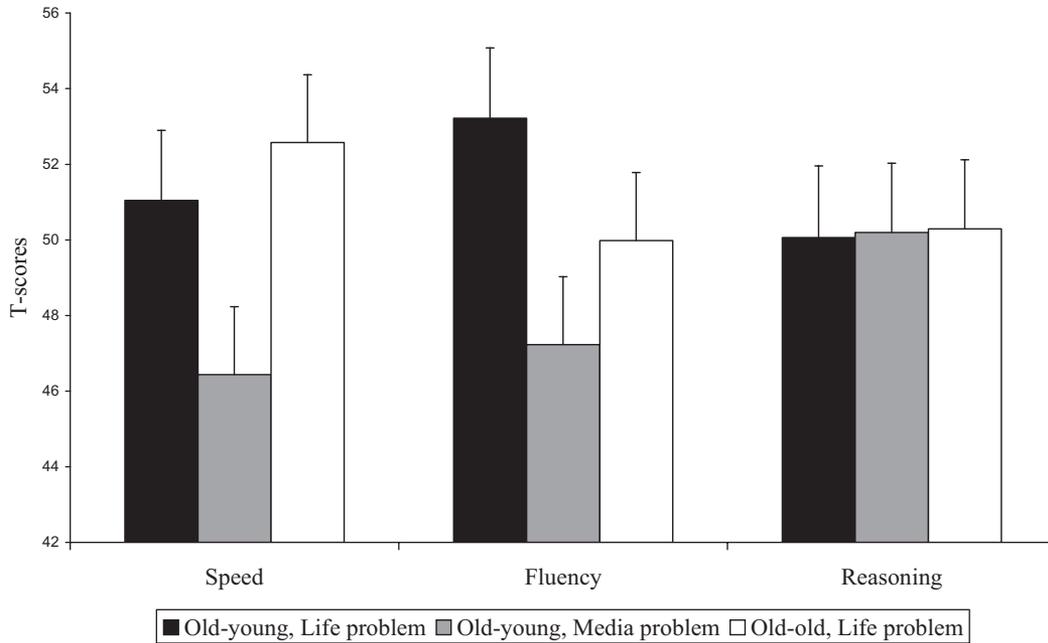


Figure 4. Mean levels (with standard errors) for speed, word fluency, and logical reasoning across the three conditions. For illustration purposes, raw scores were T-standardized.

and fluency measure. As we had not expected this effect, we can only provide post hoc speculation. Two processes may be underlying this finding: First, it may be the case that in old age, the generativity motive is activated whenever older adults' expertise in life is in demand (e.g., Greenfield & Marks, 2004). It may not be necessary that a younger person is present. This interpretation is supported by the fact that older participants in the OO-LP condition reported higher degrees of generativity (as compared with the OY-MP condition). Second, the peer condition (OO-LP) may have been experienced as a competitive situation: two experts competing with each other. Social-cognitive research suggests that competitive situations stimulate cognitive resources in older people. In one study, for example, older people performed better in an impression management task when they were told that they would be evaluated by a group of unacquainted peers (Hess et al., 2001).

With regard to emotion regulation, our model predicted that intergenerational settings that trigger the generativity motive are accompanied by more complex emotion regulation because the self is perceived as resourceful; self-esteem and a nonrepressive attitude are also supported (Labouvie-Vief & Medler, 2002). The findings of the present study lend at least some support to this expectation. Older participants in the experimental condition (OY-LP) showed a higher degree of cognitive-affective complexity than older participants in the OO-LP condition, but there was only a trend for higher cognitive-affective complexity for older participants in the OY-LP than in the OY-MP condition. It seems that in contrast to cognitive functioning, which was facilitated by introducing the topic of life experience, the facilitation of emotion regulation seems to depend more on the actual interactional experience with younger persons.

Limitations and Outlook

Several limitations of the present study warrant consideration. As mentioned before, we cannot disentangle motivational effects from additional effects resulting from the activation of age stereotypes. To overcome this limitation, future studies could systematically vary the familiarity between the interaction partners. Age stereotypes can be assumed to be weakest when interaction partners are close to each other (Kite & Johnson, 1988). Furthermore, the present study did not empirically investigate the sustainability of the effects. Given the short "intervention phase" and the motivational nature of the effects, we assume that the psychological effects reported above are short term in nature, at least for the older adults. Specifically, we do not expect the effects on cognitive functioning and cognitive-affective complexity to last far beyond the testing session (in contrast to the long-term effects typically reported for cognitive intervention programs; e.g., see Schaie, 2005, for an overview). We do assume, however, that the effects are realized whenever older persons find themselves in generative intergenerational situations. Also in contrast to cognitive intervention programs, we hypothesize that the effect is not restricted to the specific outcomes used in this study. Rather, we assume that the effects are realized in other cognitive tasks that are sensitive to motivational influences related to generativity (particularly, speed-related performance) as well as in other tasks that assess cognitive-affective complexity (e.g., when reacting to ambiguous visual material). For adolescents, the effects of the experimental manipulation may be longer lasting if indeed model learning was involved in the effects, as speculated above. Furthermore, priming studies give rise to the assumption (Fitzsimons & Bargh, 2003) that cues that activate individuals' inner mental representation of a

past generative intergenerational condition may bring about the same effects as realized in, or as a direct consequence of, this event.

Another limitation of the present study is that the model was tested using a between-subjects design. We deliberately opted for this design in order not to compromise the effect of our experimental intervention. The results of extensive randomization checks and the lack of group differences in logical reasoning provided at least some good evidence that indeed it is plausible to interpret the results in a causal manner.

Furthermore, the present study was restricted to women. Research suggests that the intensity of the generative motivation in older men is less intensive than in older women of present cohorts (Keyes & Ryff, 1998) and that older men have less well-developed generative competencies (Oyserman, Radin, & Benn, 1993). Therefore, when it comes to the generalizability of the present findings, we expect that the G1–G3 effects would be weaker in older men than in older women. As a consequence, in the sense of a negative feedback loop, the degree to which identity formation is activated in adolescents may as well be limited. On the basis of these considerations, we predict the effects to be weaker in a male sample of the present older cohorts.

In addition to gender, the generalizability of the results should also be tested with regard to educational status, given that our participants were better educated than the average member of their age group. For example, highly educated older women may possess a higher degree of generative motivation and competencies in intergenerational interaction because education enhances the concern and the ability to “give something back to society” (Keyes & Ryff, 1998).

A further limitation of the present study is that the investigation of outcomes of intergenerational interaction was restricted to a selected pool of psychological variables. In order to get a more complete picture, future research efforts may want to work with an expanded set of dependent variables (e.g., emotion regulation competencies in adolescence, dogmatism or self-insight in old age).

The present study aimed at gaining first insights in the general mechanisms of intergenerational interaction. Future studies should investigate interindividual differences in people’s response to generative intergenerational interaction. For example, it could be that in particular, older people who are very open to new social experience and only adolescents who have a positive relationship history with older people benefit from generative interactions.¹¹ The investigation of moderating variables should also include the moderating role of dyadic characteristics (e.g., familiarity among the interaction partners, educational composition). Furthermore, the experimental setting acted as a trigger for the unfolding of individual interactions. Interaction analysis may provide information on which interactional components were effective in bringing about the effects.

Conclusion

In summary, our study provided theoretical as well as first empirical evidence that the interaction between older people and adolescents may carry a unique psychological potential. This unique psychological potential seems to be motivational in nature. For this potential to be fully realized, specific contextual demands

that activate the G1–G3 motivational pattern have to be established. On a societal level, such contextual demands refer not only to opportunity structures that allow for exchange between the generations outside of kin relations and on a day-to-day basis but also to the way we think about relationships between people of different ages.

¹¹ In our sample, there was no significant interaction between condition and openness to new experience (median split: high vs. low; overall ANOVA: cognitive-affective complexity), $F(2, 83) = 0.711$, *ns*; overall MANOVA: cognitive performance, $F(6, 160) = 0.801$.

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(Appendix follows)

Appendix

Tasks

Life Problem

A person realizes that she hasn't accomplished in life what she/he once set out for. Discuss with your partner what to recommend to such a person. What should she/he consider?

New Media Problem

A TV maker plans to produce a teenagers' program for the following year. Discuss with your partner what to recommend to such a person. What should she/he consider?

*An Example of a Protocol With a High Degree of
Cognitive-Affective Complexity*

The woman had an accident with her car in the town. The car is badly damaged so that it is impossible for her to drive on. She decides to stay in the town because she likes the atmosphere, the people and the architecture. She saunters through the pedestrian zone, takes a tour of a Gothic church and dines in a little restaurant. Overall, she feels at ease, but at times she is frustrated because of the trouble with her car.

*Manipulation Check**Items of the Generativity Scale (Older People)*

I was able to pass on a lot to my conversational partner.
I did bring a lot of personal experiences to the conversation.
I did contribute a lot to the task.
I transmitted important attitudes and values to my conversational partner.

Items of the Exploration Scale (Adolescents)

I was keen on learning from the personal experiences of my conversational partner.
I was very interested in the attitudes and opinions of my conversational partner.
I did profit from the life experience of my conversational partner.

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