Sages and Seekers: Values-based life goals in intergenerational conversations increase low-SES adolescents' life purpose and sense of community participation.

(working paper)

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Abstract

Intergenerational storytelling is a ubiquitous human activity that helps individuals build relationships, learn about the social world, and grow their own identity and life goals. Yet, in modern urban society many are lonely, and do not have such opportunities. Especially in low-SES contexts, adolescents and seniors often feel isolated, just as individuals in these age groups are grappling to develop a generative narrative, in effect a new "life story," for transitioning to a new life stage (either adulthood or old age). Developing values-based life goals and a sense of purpose in these age groups is central, and involves reflecting on values-affirming life narratives, which fosters meaning making and wellbeing. Despite the need for supporting the healthy social development of adolescents and seniors through this process, and the natural function of storytelling as a supportive medium, the benefits of intergenerational storytelling as an intervention in low-SES contexts remain largely unexplored.

This study assessed the effects on adolescents and older adults' psychosocial development of an intergenerational storytelling intervention, compared to an intergenerational movie-watching control activity. Fifty-five adolescents and sixty-two older adults of low-socioeconomic status, from high minority population areas of greater Los Angeles, participated.

Results showed that the intergenerational storytelling intervention increased adolescents' reported sense of social connectedness, psychological wellbeing, and purpose-in-life, and especially so for participants with the lowest initial levels. Moreover, adolescents' changing abilities to conceptualize their future goals in terms of ethical and relational values, instead of hedonistic or pragmatic motives, mediated the increases in reported purpose-in-life. Among older adults, participating in either condition increased generativity and working memory performance, with those in the storytelling condition benefitting marginally significantly more

than those watching movies. By integrating findings with insights from developmental and neuropsychological research on meaning making, values, and purpose, our study suggests that intergenerational programming may be useful in promoting flourishing of two highly vulnerable age groups—adolescents and older adults.

Executive Summary

Overview of project and research objectives

This project partnered Immordino-Yang's lab at USC with Sages & Seekers (www.sagesandseekers.org), a non-profit organization dedicated to conducting intergenerational storytelling interventions. Storytelling is considered an art form that is hypothesized to contribute to character development and wellbeing. The Sages & Seekers intergenerational storytelling intervention supports youth—older-adult pairs in reflecting on values-affirming, emotionally rich personal narratives. At the culmination of an 8-week program, adolescents formalized their experiences by writing and sharing a tribute honoring the meaning they and their older adult partner made together.

The project had the overarching aim of investigating the effects of this intergenerational storytelling intervention on adolescents and older adults' healthy psychosocial development. In particular, this study aimed to assess the effects on psychological wellbeing, purpose-in-life, social connectedness and social-emotional imagination after either the Sages & Seekers intergenerational storytelling intervention or an intergenerational movie-watching control activity. Participants were adolescents and older adults from low-socioeconomic status, high minority-population areas of Greater Los Angeles. In addition, the effects on adolescents' growth mindset, value-based life goals, and civic participation, as well the effects on older adults' generativity and working memory, were compared across the Sages & Seekers intervention and the movie-watching control groups.

Overview of methods

Fifty-five adolescents and sixty-two cognitively healthy and functionally independent older adults participated in this quasi-experimental study examining the effects of

intergenerational storytelling relative to a control condition. In a *pre- post design*, adolescents completed validated self-reported surveys about psychological wellbeing, purpose-in-life, social connectedness, growth mindset, and social-emotional imagination. Adolescents responded via an open-ended questionnaire about life goals, which were qualitatively categorized as focused on core values or hedonistic gains. Adolescents also responded to open-ended questions about civic participation, which were qualitatively coded as either showing a concrete approach to social problem-solving, based on stipulating specific desired outcomes, or as showing an abstract approach, based in a grounded understanding of different perspectives reached by dialoguing and empathy. Older adults completed validated self-reported surveys of psychological wellbeing, purpose-in-life, social connectedness, generativity, and social-emotional imagination, as well as cognitive testing of working memory.

Summary of key findings

Adolescents' social connectedness improved significantly more in the Sages & Seekers intervention, compared to in the control condition.

Adolescents' psychological wellbeing improved significantly more in the intervention group. Among those in the intervention condition, adolescents with the lowest scores at pre-testing showed the greatest growth.

Adolescents' sense of purpose-in-life improved significantly more in the group participating in the Sages & Seekers intervention, and especially strongly in those with low scores at pre-testing. The frequency with which adolescents spontaneously mentioned value-based life goals in their open-ended responses mediated the effects of the Sages & Seekers intervention on the increases in purpose-in-life.

Among the older-adult participants, those who participated in the intervention improved their generativity more than those who participated in the control (movie-watching) condition. This was especially true for those with the lowest scores at pre-testing. Older adults with the lowest generativity at pre-testing in the control condition also improved more.

Older adults participating in the intervention marginally significantly improved working memory, and this effect was especially strong among those with the lowest working memory at pre-testing.

Overview of discussion

Our intergenerational storytelling proved to be an effective intervention to promote social connectedness among low-SES adolescents. Intergenerational storytelling also promoted wellbeing and sense of purpose-in-life in these adolescents, especially in the ones with lowest scores at baseline. The intervention promoted generativity and working memory performance in older adults.

A Sages & Seekers-style program is efficacious, affordable, and potentially scalable. This work contributes to uncovering the psychological mechanisms and behavioral correlates of an arts intervention that provides adolescents and older adults with opportunities for reflecting on their communities in relation to their future goals, in order to promote healthy development and thoughtful citizenship.

By examining the potential mechanisms by which this intervention succeeded (or not), the work contributes to understanding how value-based goals may enable and explain the effects. This research illustrates for policy-makers the potential benefits of providing adolescents with art-based skills and opportunities for personal reflection in the context of relationships, and the role of values in psychological growth.

In demonstrating the effectiveness of an established arts-based educational storytelling program in promoting healthy development of adolescents and seniors, our work informs practitioners and school administrators about the benefits of intergenerational storytelling. An attractive platform for both age groups, incorporating storytelling could expand the repertoire of educational practices that promote social-emotional learning in communities and schools.

Introduction

Sharing personal narratives is an ancient human activity that supports self-understanding and the formulation of personal and community values and identity (Bell, 2010; Charmaz, 1999; Ochs & Capps, 2001). Storytellers reminisce and reflect (McAdams & McLean, 2013; Slater & Rouner, 2002), which supports them in experiencing transformative revelations and encourages behavioral and attitudinal change for their future life (Larkey & Gonzalez, 2007). Listeners, in turn, can support storytellers by encouraging, editing, synthesizing and making meaning of the life stories they hear. Listeners provide an audience and social support for the storyteller, but also learn about how to handle various life circumstances, dilemmas and feelings. Personal storytelling in the context of a close relationship is a major cultural outlet for conveying morals and expressed values between older and younger people, and an opportunity for both partners to reflect and extract meaning.

Intergenerational storytelling may be especially useful for adolescents, who are struggling to develop their identity and a vision for their future adult self (Erikson, 1968). Adolescents' building of life goals involves the simulation of possible futures and integration of memories and experiences—both one's own subjective recollections, and inferred perceptions about those of others (Charmaz, 2002). This is especially true for values-based life goals, which involve intentions of achieving something that is intrinsically meaningful or that positively transforms the lives of others. Unlike the more mundane and concrete goals that adolescents build to manage day-to-day tasks, acquire goods or status, values-based life goals are abstract and characterized by ethical and prosocial motives that transcend any one given situation (Yang, Pavarini, Schnall, & Immordino-Yang, 2018; Vallacher & Wegner, 1987). Though concrete goals can be beneficial to the self or others, they are utilitarian and involve specific actions and

achievements that can be directly observed. By contrast, values-based goals are not observable—they reside in the intentions and qualities of mind that motivate dispositions and interpretations, and therefore transcend any particular circumstance (Yang et al., 2018). For example, an older adolescent may aspire to become a pediatrician, holding the concrete goal of being responsive to her patients' medical needs, and the abstract, values-based goal of helping all children flourish. Though concrete goals can often be completed in the service of broader, values-based goals, it is values-based goals that are associated with psychological and cultural wellbeing (Davids, Roman & Kerchhoff, 2017), life purpose, tendencies toward perspective-taking and dialog, as well as with effective learning mindsets for growing one's self inside and outside of school (Yeager & Bundick, 2009; Yeager et al., 2019) .

In the building of values-based identity and associated life goals, adolescents benefit from strong, appropriate relationships with adults outside their immediate families who can help them reflect on their life purpose and build a strong sense of civic participation (Damon, 2008). High-quality relationships, nurtured either through community organizations, religious or school groups, or in mentoring settings, can provide instrumental and emotional resources for values-based life goal formation and pursuit, boost adolescents' motivation to achieve values-based goals, and promote a prosocially-oriented sense of purpose (Liang, Tracy, Taylor & Williams 2002; Lund, et al., 2019).

Older adults are well positioned to support adolescents in these pursuits. Older adults tend to be more emotionally stable and positivitely biased (Carstensen, 2014). The wisdom gained from their extensive lived experience and social problem-solving skills (Grossmann, Karasawa, Kan, & Kitayama, 2014; Parisi, et al., 2009) can support adolescents in developing socio-emotional skills and skills for self-reflection (Kessler & Staudinger, 2007).

Engaging with young people around storytelling can also be beneficial for older adults. Older adults are working on constructing a life review, a dynamic and self-evaluative form of personal reminiscence (Molinari & Reichlin, 1984) that supports an attitude of generativity in old age (Erikson, 1980). The deeply emotional and cultural processes that take place when sharing life stories are experiential and memory-based. Thus, they are also likely to improve seniors' cognition. The conversations initiated by intergenerational storytelling are also deeply social and relational, allowing older adults to feel they are giving back to a younger person in their community—an intrinsically rewarding and developmentally appropriate task (Mager, 2019).

Though in optimal conditions older and younger individuals naturally come together to build relationships and reflect on personal stories, in many modern communities, especially low-SES urban communities, individuals may feel lonely and disconnected (Algren, et al., 2020). An intergenerational storytelling program could be used to foster beneficial social relationships, provide a safe space for reflection on values-based goals that lead to the construction of purpose, and support both adolescents' and older adults' positive development (Fivush, Bohanek, & Zaman, 2011). Although storytelling interventions have been successfully used in health care (Haigh & Hardy, 2011) and education (Killick & Thomas, 2007) and have been suggested to hold promise in intergenerational community settings (Jones, Herrick & York, 2004), studies of interventions that involve intergenerational storytelling are lacking. Involving elders and youths in such programming could counter the threat of social disconnection and decline in purpose and wellbeing so common among members of these age groups (Scott & DeBrew, 2009; Hawkley, Kozloski, & Wong, 2014; Keyes, 2011; Twenge, Spitzberg, & Campbell, 2019).

As a first test of these ideas, here we partnered with an organization that delivers intergenerational storytelling interventions (Sages & Seekers; www.sagesandseekers.org) to

adapt the program for an urban low-SES context, and studied the impact on participants. The Sages & Seekers intergenerational storytelling intervention supports youth—older-adult pairs in reflecting on values-affirming, emotionally rich personal narratives in a small-group, community setting. At the culmination of the 8-week program, adolescents formalize their experiences by writing and sharing a tribute honoring their older adult partner. The control condition was an intergenerational movie-watching activity with the same number of one-on-one social-contact hours (length of one-on-one interaction in the intervention=5 hours; control=5.3 hours). Though watching movies together is enjoyable and promotes companionship, there is no direct support for the effortful, reflective construction of personally relevant narratives that is the focus of the intervention.

Using open-ended questionnaires and surveys, we assessed participating adolescents' life goals, purpose-in-life, wellbeing, social connectedness, growth mindset and sense of civic participation before and after the intervention or control activity. We assessed older adults' wellbeing, social connectedness, generativity, and working memory. We expected that the intervention would increase adolescents' and older adults' psychosocial functioning compared to the intergenerational movie-watching activity. We also expected that the intervention would specifically promote the development of values-based life goals rather than hedonistic or instrumental life goals among adolescents, and that increases in values-based life goals (only) would mediate effects of the intervention on purpose-in-life. We also tested whether the storytelling intervention would promote more values-based and less concrete conceptions of civic participation, and if so, whether adolescents who increased their values-based life goals more were also more likely to think abstractly about civic participation following the

intervention. We expected that the storytelling intervention would improve working memory in the older adults.

Methods

Study design

This was a quasi-experimental intervention study on the effects of an intergenerational storytelling intervention on adolescents' and older adults' positive psychological development. The study involved pre-testing, either an 8-week intergenerational storytelling intervention or a movie-watching intergenerational control activity with the same number of social-contact hours as the intervention, and post-testing. At the end of the movie-watching control activity, participants were offered the opportunity to partake in the intergenerational storytelling intervention.

Recruitment and sampling strategy

Participants were recruited from after-school programs, religious organizations, retirement homes, and community centers serving low-SES areas in Los Angeles County. To be included, adolescents needed to be between 14-18 years old, enrolled full-time in school, in good academic standing, and with no serious disciplinary record. Older adults were required to be at least 65 years old, with no evidence of cognitive or functional impairment as measured by a screening test we administered prior to enrollment (Brown et al., 2017), and living independently (Lawton & Brody, 1969).

Sample

A total of 55 adolescents participated (M_{age} = 16.39; 22 male/ 30 female; $M_{self-reported GPA}$= 3.27; cultural background: 3 Black/ 2 East-Asian/ 35 Latinx/ 1 Middle-Eastern/ 3 White/ 6 mixed). A total of sixty-two cognitively healthy and functionally independent older adults

participated (M_{age} = 72.97; 39 female/20 male; educational level: 11 high school/ 37 bachelor's

or higher degree; cultural background: 17 Black/ 1 East-Asian/ 5 Latinx/ 30 White/ 4 mixed). Of

these, 47 adolescents and fifty-two older adults took part in the intergenerational storytelling

intervention. Eighteen adolescents and 25 older adults participated in the intergenerational

movie-watching control activity. [Of the control participants, ten adolescents and fifteen older

adults opted to participate in the intervention following the control condition.] Participants and

their legal guardians (if under 18), signed informed consents/assents. Participants did not receive

compensation for their participation, as both programs were considered to provide a benefit.

Table 3 presents descriptive information for participants. Among adolescents, in part

because of neighborhood demographics and in part by chance, intervention participants, though

similar in age to control participants, tended to be in a higher grade at school, χ^2(4, N= 61)= 15.6,

p < .01, and were more likely to identify as Latinx, χ^2(6, N= 61)= 13.02; p = .04. Older adults

differed in ethnic heritage distribution across groups, χ^2(4)= 11.53, p = .02; those in the

intervention groups were more likely to identify as Black or White rather than Latinx. Among

older adults, those in the intervention condition reported observing cultural traditions more than

did those in the movie-watching control condition, t(33.65)= 2.49; p = .02.

Table 3.
Participants' demographic information.

Variable	Storytelling intervention	Movie-watching activity	Statistical test
	Adolescents		
n	47	18	
Sex (female/male)	26 (40%) / 17 (26%)	10 (15%) / 8 (12%)	χ^2(1, N=61)=1.7
Age	16.7 (1.04)	16.1 (1.2)	t(28.1)=1.82
Grade			χ^2(4, N=61)=15.6**
9th	1	6	
10th	7	2	

11th	15	2	
12th	20	8	
Mean GPA (1-4 scale)	3.25 (0.64)	3.28 (0.55)	$t(35.44)=-0.17$
School classes dropped/failed			$\chi^2(2, N=60)=4.08$
0	27	10	
1-3	10	8	
4 or >	5	0	
Ethnic Heritage			$\chi^2(5, N=61)=13.02*$
Black	3	1	
East-Asian	0	2	
Latinx	34	9	
White	1	2	
Middle-Eastern	0	1	
Mixed	5	3	
Bicultural index	66.67 (10.33)	69.81 (10.72)	$t(27.04)=-0.99$

Older adults			
n	52	25	
Sex (female/male)	32 (42%) / 17 (22%)	19 (24%) /6 (8%)	$\chi^2(1, N=74)=0.88$
Age	73.82 (11.60)	77.10 (10.85)	$t(43.52)=-1.08$
Educational Level completed			$\chi^2(1, N=61)=3.8$
High School	8	6	
Bachelor's degree	31	16	
Ethnic Heritage			$\chi^2(4, N=72)=11.5*$
Black	16	1	
East-Asian	1	1	
Latinx	2	5	
White	27	13	
Mixed	3	3	
Observe cultural traditions (0-100)	73.76 (21.42)	52.9 (30.92)	$t(33.65)= 2.49*$
Embrace cultural values (0-100)	74.78 (23.42)	62.71 (33.98)	$t(35.10)= 1.35$
Proud of cultural heritage (0-100)	87.95 (18.54)	76.00 (31.63)	$t(33.90)=1.52$

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

The activities were conducted at neighoborhood gathering places, such as libraries and senior centers.

Intergenerational storytelling intervention

The eight-week intergenerational storytelling curriculum was designed to foster positive youth development, and a strong bond between the adolescent and senior partners. One adolescent and one older adult paired up to complete the semi-structured storytelling activities facilitated by a trained practitioner. The intervention was run in groups of approximately 13 adolescent-older adult pairs. The first seven sessions lasted 75 minutes and the eighth session lasted 30 minutes.

In week 1, adolescents and older adults engaged in introductory group activities focused on examining and overcoming preconceptions about age. In Week 2, each adolescent spent 3-5 minutes with each adult in a "speed-dating" storytelling activity, so that participants could choose a partner for the remainder of the program. Over the remaining four weeks, the pairs engaged in specially designed storytelling activities with props, such as memorabilia brought from home. The pairs shared and reflected on commonalities and values that emerged. In Week 7, adolescents composed and shared tributes to their partners. The program concluded in Week 8 with a debriefing to reveal lessons learned and to provide an opportunity for closure. After each session, adolescents were requested to reflect on their learning and experienced emotions in a short video-diary activity.

Intergenerational movie-watching control activity

The control condition consisted of intergenerational movie-watching activities that, though involving stories and spontaneous discussions, did not specifically support reflecting on personal narratives. The intervention ran in groups of 13 adolescents and 13 older adults and had

the same number of social-contact hours one-on-one as the intergenerational storytelling intervention. After introductory activities, adolescent-older adult groups watched movies portraying romance and friendship. Participants watched *Breakfast at Tiffany's* (Edwards, 1961), *Casablanca* (Curtis, 1942), and *Monster-in-Law* (Luketic, 2005).

Measures for adolescents

      Surveys. Adolescent participants were administered self-reported surveys on psychological well-being (Ryff, 1989), sense of purpose-in-life (Byron & Miller-Perrin, 2009), social connectedness (Lee & Robbins, 1995), and growth mindset (Dweck, 2006). At baseline only, in order to further characterize the participants, adolescents completed the Bicultural Index (Hunter, 2006).

      Qualitative analyses. In order to examine adolescents' life goals, participants were administered a modified version of the Possible Selves Questionnaire (Oyserman & Markus, 1990). Life goals and motives formulated by adolescents were qualitatively categorized as either values-based or concrete, following Riveros (2020). Values-based life goals were defined as goals focused on developing character qualities and personal growth, goals greater than the self such as community-related goals, and goals involving service to others. Representative responses from participants in Riveros (2020) were: "*I think I'd still like to help others, so organizations like Red Cross or just do some kind of volunteer work with my free time*", "*And* [I want to] c*ontinue being a hard worker and staying humble*". Concrete goals were defined as goals focused on acquiring goods, gaining popularity, status, favorable social comparisons, and hedonistic values. Representative responses were: "*I don't wanna be homeless*", "[I want] *to have a nice car*". Tallies of values-based and concrete based goals were calculated for each participant. Analyses carried out in a similar sample of low-income LA-area adolescents for

Riveros (2020), with the same experimenters and coders, yielded strong inter-rater reliability (90% ICC).

In order to examine adolescents' orientation toward civic participation, participants were administered the item pertaining to civic participation from the Forms of Purpose Determination validated interview (Malin, 2008). Participants were questioned about what they would like to change in the world. Responses were coded as either values-based (and abstract) or concrete. A values-based response was defined as revealing a desire to build a common understanding, shared belief or value through dialogue, perspective taking and empathy. For example: "*I wish that everyone in the world was more understanding of one another, [...] I think that it is really important to reach out to others, hear their stories, and put yourself in their shoes*". A concrete response was defined as stipulating a specific behavioral outcome as a desired change, with an emphasis on civil behavior rather than on values or ideas. For example: "*I want people with differing opinions to get along.*"

Measures for older adults

Surveys. Older adult participants completed self-reported surveys on psychological well-being (Ryff, 1989), sense of purpose-in-life (Byron & Miller-Perrin, 2009), social connectedness (Hawkley, Kozloski, & Wong, 2014), and generativity (McAdams & de St. Aubin, 1992). To help characterize the sample, they also rated the degree to which they observe cultural traditions, embrace cultural values, and hold pride in cultural heritage on a 1-100 scale, where 100 indicated the highest level of agreement.

Psychometric testing. Older adult participants completed the Digit test from the Wechsler Adult Intelligence Scale, Third Edition (WAIS-III; Kaufman & Lichtenberger, 1999).

Working memory was measured by the number of digits correctly retrieved in the backward subscale of the Digit Test.

Analytical Plan

First, descriptive statistics were used to characterize the participants. Independent t-tests were conducted to compare the groups at baseline. We also tested whether outcome variables were correlated at baseline.

Next, for the adolescent participants, ANCOVA built-in regression models were used to test the main effect of treatment condition (storytelling or movie-watching) on the difference between pre and post scores. We also tested the interaction between the change of scores for each group and the scores at baseline (i.e. a multiplicative interaction), to control for the group differences at baseline that we had identified. For the older-adult participants, ANCOVA built-in regression models were used to test whether the treatment condition and scores at baseline predicted changes in scores pre to post. (Given that we had found no differences between groups at baseline for older adults, we did not test for multiplicative interactions.) In all models, the treatment condition was dummy-coded using the movie-watching control activity as the reference treatment.

Finally, we tested whether change in adolescents' values-based goals mediated the change in purpose-in-life score. A post-hoc power analysis was conducted to test the robustness of the mediation model.

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Results

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Effects of the intergenerational intervention in adolescents

Summary statistics for all measures collected, and the calculated change of scores used in the analyses are presented in Table 4. Groups differed on pre-test scores: participants in the

intergenerational storytelling intervention scored significantly lower in social connectedness at baseline than did the participants in the control group, $t(42.2) = -2.1$, $p = .04$. Table 5 presents correlations for outcome measures.

Table 4.
Adolescents' scores and changes pre to post by condition.

Variable	Storytelling intervention				Movie- watching control				Group differences at Pre-testing
	Pre		Change Score		Pre		Change Score		
	M	SD	M	SD	M	SD	M	SD	
Psychological well-being	83.1	16.1	0.8	13.8	87.3	9.8	1.4	3.4	$t(50.8)=-1.3$
General life purpose	68.6	14.4	8.7	13.9	74.4	9.6	0.9	3.1	$t(46.4)=-1.9$
Growth mindset	29.3	5.0	1.1	3.9	30.9	4.4	1.8	4.0	$t(35.6)=-1.3$
Social connectedness	34.1	11.7	2.7	9.7	40.1	7.6	-3.3	7.9	$t(42.2)=-2.1*$
Values-based life goals	0.8	0.8	0.4	1.1	0.9	1.0	-0.2	1.0	$t(26.1)=-0.3$
Concrete life goals	2.7	1.1	-0.5	1.4	2.9	1.3	-0.4	1.5	$t(27.5)=-0.5$

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

**Table 5.**
Correlation of adolescents' scores at pre-testing.

Variable	1	2	3	4	5	6
1.Psychological well-being	-					
2.General life purpose	0.8***	-				
3.Growth mindset	0.2	0.3*	-			
4.Social connectedness	0.6***	0.7***	0.1	-		
5.Values-based life goals	0.1	0.3*	-0.1	0.2	-	
6.Concrete life goals	-0.1	-0.2	0.1	-0.2	-0.6***	-

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

Adolescents' social connectedness improved significantly more in the intervention group, b= 1.56, SE= 14.91, $t(35)= 2.11$, $p < .05$, especially in participants whose pre-test scores were

low (see Figure 5). This model explained 30% of the variance in adolescents' social

connectedness, R^2= 0.30, $F(3,35)$= 5.01, $p < .01$.

Figure 5.
**Changes in adolescents' social connectedness as a function of initial score by condition.**
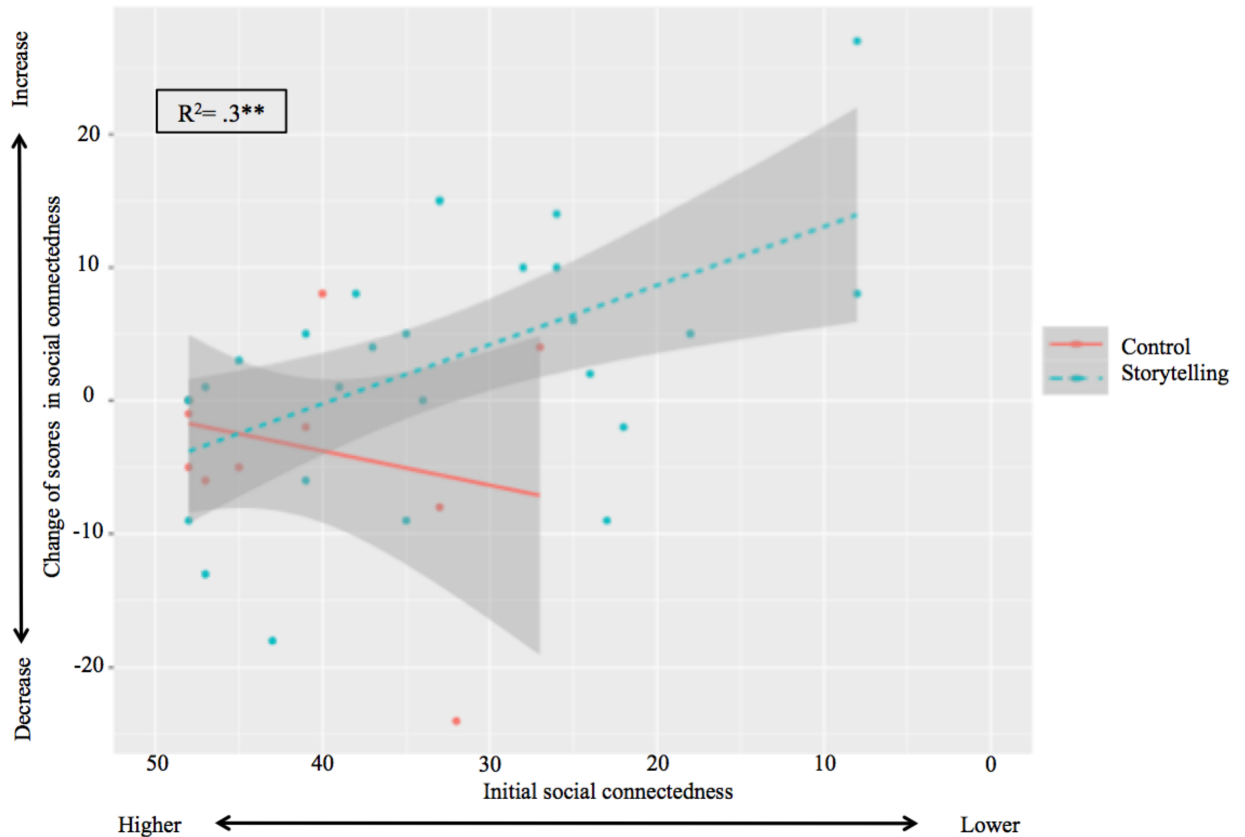
*$p < .05$. **$p < .01$. ***$p < .001$

Note. The storytelling intervention increased social connectedness among adolescents, and especially among participants with the lowest scores at pretesting. No score changes were observed in the control condition.

Adolescents' psychological well-being improved significantly more in the intervention

group, b= 2.12, SE= 19.28, $t(48)$= 2.9, $p < .01$. Among those in the intervention group,

adolescents with the lowest scores at pre-testing showed the greatest growth, b= -2.29, SE= 0.21,

$t(48)$= -3.18, $p < .01$; see Figure 6. This model explained 69% of the variance in psychological

well-being, R^2= 0.69, $F(3, 48)$= 34.99, $p < .001$.

Figure 6.
**Changes in adolescents' psychological wellbeing as a function of initial score by condition.**
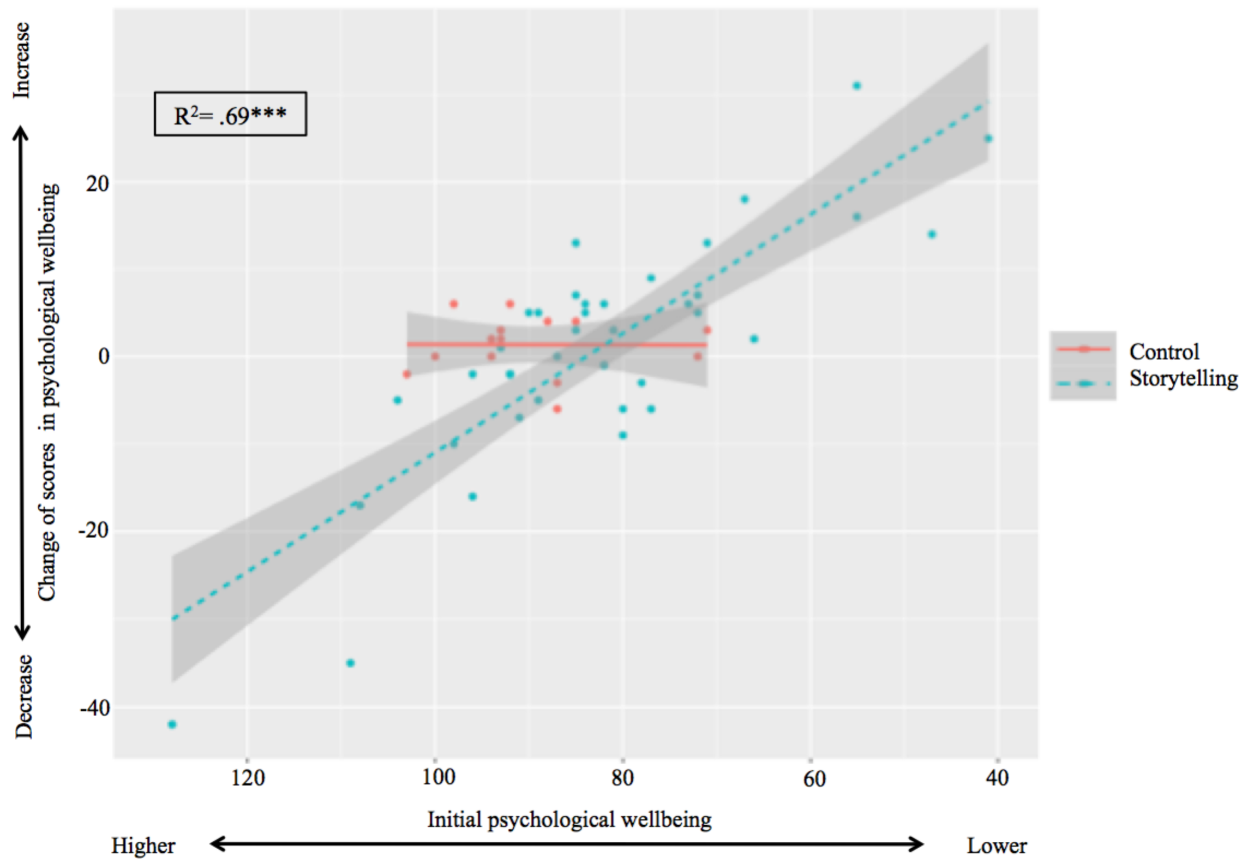
*p < .05. **p < .01. ***p < .001
Note. Low-scores participants at baseline in the storytelling condition increased their scores in psychological wellbeing. High-score participants in the storytelling condition decreased in their scores. No score changes were observed in the control condition.

Adolescents' sense of purpose-in-life improved significantly more in the intervention group, b= 2.03, SE= 20.99, $t(51)$= 2.76, $p < .01$, especially among those with the lowest scores at pre-testing, b= -1.9, SE= 0.27, $t(51)$= -2.67, $p < .01$; see Figure 7. This model explained 58% of the variance in sense of purpose-in-life, R^2= 0.58, $F(3,51)$= 23.08, $p < .001$.

Figure 7.
Changes in adolescents' purpose in life as a function of initial score by condition.
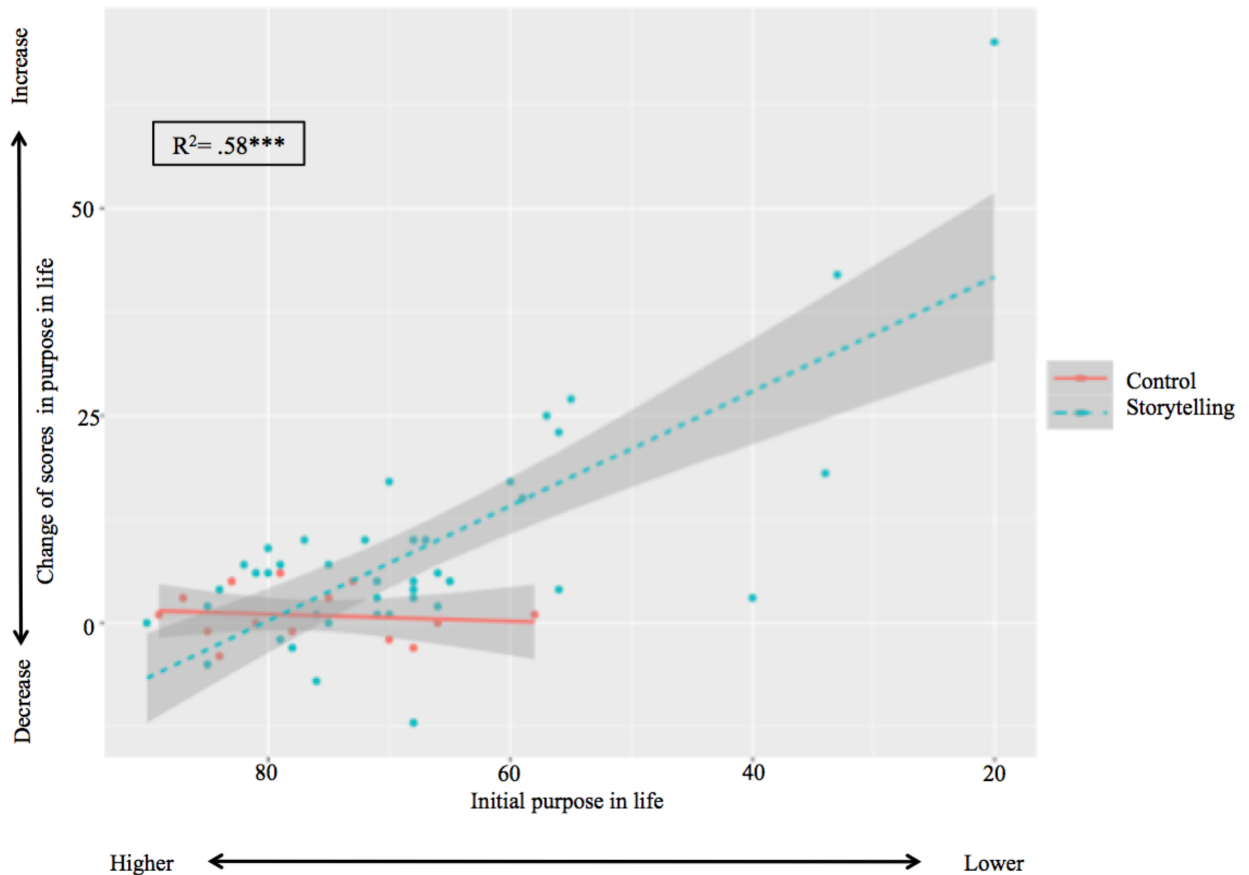
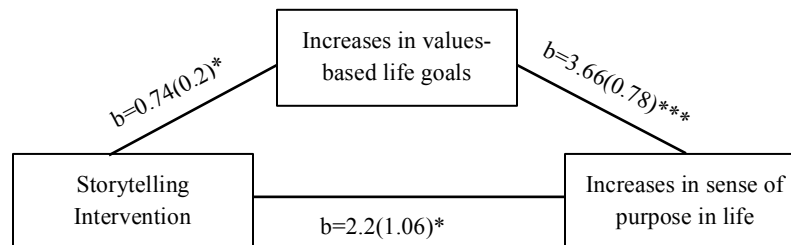*p < .05. **p < .01. ***p < .001

Note. In the storytelling condition, adolescents with low initial scores increased their sense of purpose. No score changes were observed in the control condition.

Regardless of condition, values-based life goals increased more among adolescents with the lowest initial scores, b= -0.49, SE= 0.26, $t(50)$= -2.35, $p <$. 05. This model explained 31% of the variance in change in values-based life goals, R^2= 0.31, $F(3,59)$= 7.6, $p < .001$.

Increases in values-based goals mediated the effects of the storytelling intervention on purpose-in-life, b = 0.74, SE = 0.29, p = .014, and increases in values-based goals were a significant predictor of sense of purpose-in-life, b = 3.66, SE = 0.78, $p < .00$. The storytelling intervention was no longer a predictor of sense of purpose-in-life after controlling for the mediator, values-based life goals, b = 2.29, SE = 1.79, p = .21, consistent with full mediation; see Figure 8. Approximately 31% of the variance in sense of purpose-in-life was accounted for by

the predictors, $R^2= 0.31$, $F(2,51)= 11.72$, $p < .00$. The indirect effect was formally tested using the Sobel test, and indicated that the indirect coefficient was significant, b= 2.15, SE = 1.06, $p = .03$. A post-hoc analysis of the power of this finding, taking into account an $\alpha= .05$ and $R^2= 0.31$, leads to a power of .99, indicating the robustness of this result.

Figure 8.
Increases in adolescents' purpose in life after the storytelling intervention are mediated by increases in adolescents' values-based life goals.

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

Adolescents' conceptualizations of social and community problems to the prompt "what in the world would you like to be different?" shifted from concrete (e.g. "I wish everyone got along") to abstract (e.g. "we should use dialog and empathy to understand others") only following the storytelling condition, χ^2 (3, N=113)= 7.8, $p < .04$. Table 6 presents frequencies for coded responses on civic participation pre and post-testing.

Table 6.
Counts of adolescents' qualitatively coded responses about sense of civic participation.

Coded responses	Pre		Post	
	n	%	n	%
Storytelling intervention				
Abstract understanding	5	4.4	15	13.2
Concrete understanding	37	32.7	26	23
Movie-watching activity				
Abstract understanding	5	4.4	4	3.5
Concrete understanding	13	11.5	8	7

Note. Cell numbers provide tallies for the numbers of participants whose response fell into the relevant category.

Effects of the intergenerational storytelling intervention in older adults

The storytelling and control participants did not significantly differ on psychosocial measures at baseline (all $p > .05$). A summary of the results for older adult participants is presented in Table 7. Table 8 presents the correlations for outcome measures at pre-testing.

Table 7.
Older adults' initial scores and changes pre to post-testing by condition.

Variable	Storytelling intervention				Movie- watching activity				Group differences at Pre
	Pre		Change Score		Pre		Change Score		
	M	SD	M	SD	M	SD	M	SD	
Psychological well-being	91.2	7.5	0.3	7.1	87.4	12.5	3.2	12.0	$t(32.5)=1.4$
General life purpose	78.5	7.7	0.89	6.87	77.8	0.9	1.1	5.1	$t(41.6)=0.3$
Generativity	41.1	7.48	5.8	7.3	40.5	8.2	2.3	8.6	$t(41.7)=0.3$
Social connectedness	18.2	2.5	0.4	1.71	17.1	3.5	0.4	2.9	$t(34.9)=1.4$
Working memory	4.5	1.3	0.2	1.3	4.2	1.2	-0.2	1.1	$t(45.5)=1.0$

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

Table 8.
Pearson correlations of older adults' scores at pre-testing.

Variable	1	2	3	4	5
1.Psychological well-being	-				
2.General life purpose	.4***	-			
3.Generativity	.3*	.6***	-		
4.Social connectedness	.5***	.3*	.3	-	
5.Working memory	.2	.01	-.2	.2	-

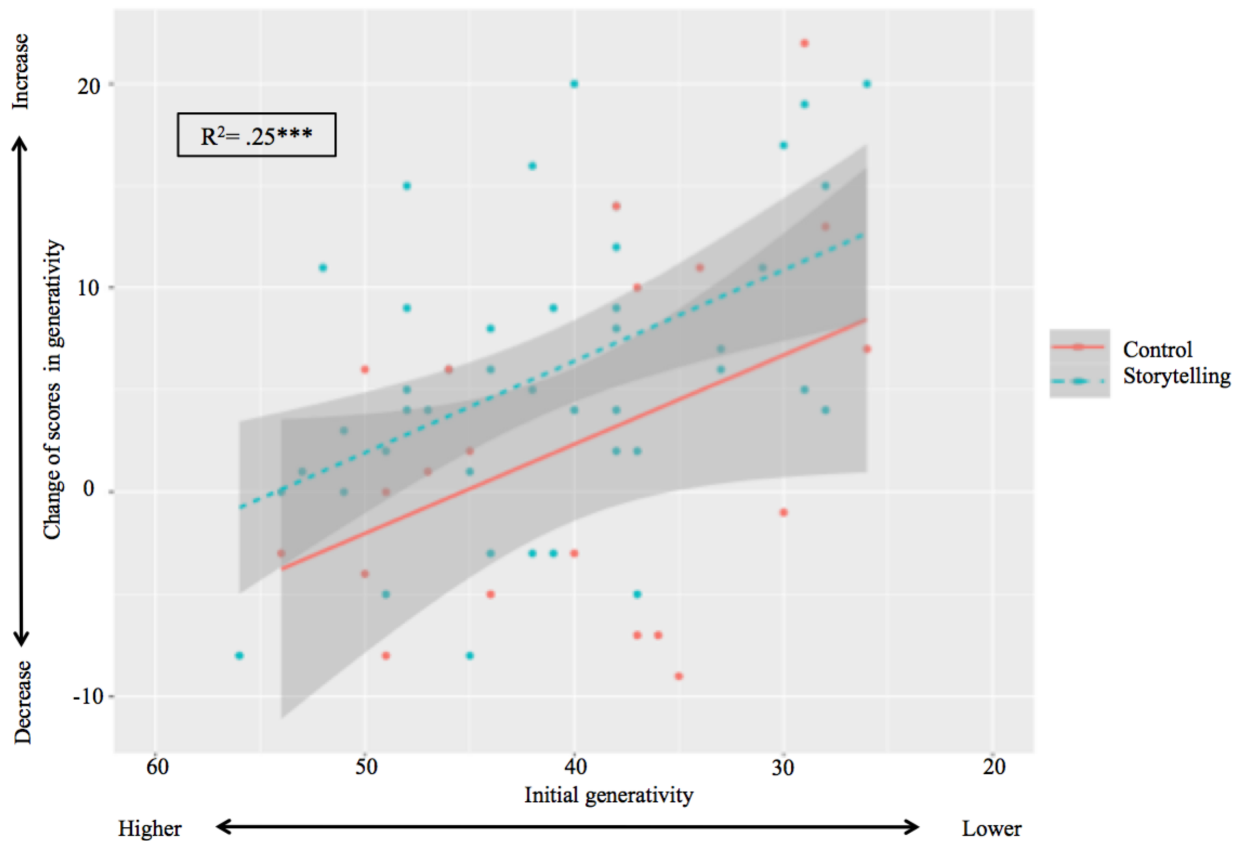$*p < .05. **p < .01. ***p < .001$

No changes were observed to psychological wellbeing, general purpose-in-life, and social connectedness among the older adults (all $p > .05$).

Among the older-adult participants, those who participated in the intervention improved their generativity more than those who participated in the control condition, b= 4.06, SE= 1.86, $t(60)= 2.18$, $p = .03$. This was especially true for those with the lowest scores at pre-testing, b= -

0.44, SE= 0.1, $t(58)$= -4.05, $p <$ .00. It is worth noting that older adults with the lowest

generativity at pre-testing also improved more following the control condition (see Figure 9).

This model explained 25% of the variance in generativity, R^2= .25, $F(2,60)$= 10.04, $p <$.001.

Figure 9.
**Changes in older adults' generativity as a function of initial score by condition.**

*$p <$ .05. **$p <$ .01. ***$p <$ .001
Note. Low-scoring participants in the intervention and control condition increased their sense of generativity.

A similar result was found for working memory. Among the older adults, participating in

the intervention marginally significantly improved working memory, b= 0.52, SE= 0.20, $t(59)$=

1.86, p = .06, and this effect was especially strong among those with the lowest working memory

at pre-testing, b= -0.48, SE= 0.51, $t(58)$= -4.64, $p <$ .00; see Figure 10. This model explained

29% of the variance in change of working memory scores, R^2= .29, $F(2,59)$= 11.78, $p <$ .001.

Figure 10.
Changes in older adults' working memory as a function of initial score by condition.

$R^2 = .29**$
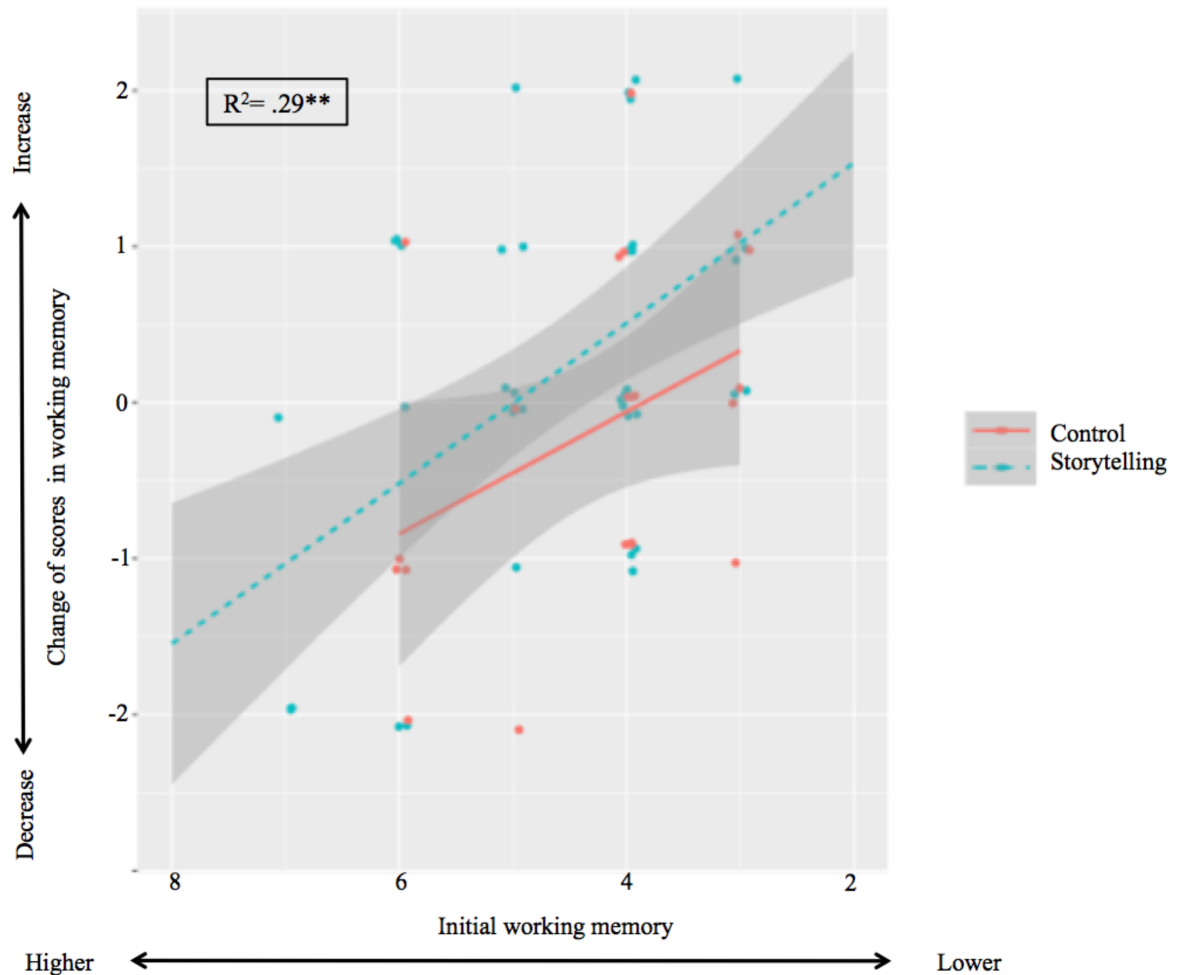
*p < .05. **p < .01. ***p < .001
Note. Working memory increases in low-score participants in the intervention and control condition.

Discussion

This research examined the effects of an intergenerational storytelling intervention on adolescents' and older adults' psychosocial development. In the study, the intergenerational storytelling intervention was compared to an intergenerational movie-watching activity that, while involving stories and social camaraderie, did not specifically support participants' reflecting on their life narratives or thinking deeply about their values and beliefs. The intervention promoted social connectedness among the adolescent participants, and, especially among participants with the lowest scores at baseline, it promoted wellbeing and purpose-in-life.

Among the older-adult participants, the intervention condition was associated with stronger improvements in working memory. However, among the older adults, both the intervention and the movie-watching activity promoted generativity and working memory performance, suggesting that intergenerational activities in general, or possibly simply organized opportunities for friendly social interaction, promoted social-emotional and cognitive health in this age group. For both adolescents and older adults, the results across the study were especially strong for participants with the lowest levels of functioning at the start of the study, supporting the suitability of this intervention in vulnerable groups (Palacios et al., 2015). Overall, the results suggest that our intergenerational storytelling intervention was beneficial, and especially so for the adolescent participants.

One reason that the storytelling intervention was more effective than the movie-watching condition for the adolescents appears to be that the intervention afforded needed opportunities to reflect on core values, and to embed these values in life narratives. Though adolescents who participated in the storytelling activities increased their number of values-based life goals only marginally more than did adolescents who watched movies with their partner, the amount of increase in values-based goals mediated the effects of the intervention on life purpose only in the storytelling condition. Further, only in the storytelling condition were participants more likely to change their conceptualization of civic participation from more concrete to more abstract and values-based. These findings suggest that reflecting on ethical and relational values underlying life narratives, with the guidance of a sympathetic older-adult partner, might help adolescents to operationalize their values into plans for themselves and their communities. Doing so is known to heighten adolescents' sense of goal-directedness and motivation (Merrill & Fivush, 2016), which is consistent with our finding that life purpose increased in this age group.

Our study contributes to advancing understanding of how adolescents' reasoning as they formulate life goals supports their wellbeing. Our findings underscore the importance of probing not simply what adolescents' life goals or civic contributions are, but how they have arrived at those goals and how they conceptualize their civic contributions. As others have suggested (Kasser & Ryan, 1996), goals and reasoning that are underlain by values-based deliberations rather than by instrumental aims may be more beneficial for psychosocial growth.

Among older adult participants, the main effect of scores at baseline for both generativity and working memory suggests that any form of social connection may be helpful for low-scoring participants. A wide variety of intergenerational programs have been found to support older adults' physical and mental health by providing a sense of meaningfulness and by supporting shared opportunities for relationship building and growth (Murayama et al., 2015; Teater, 2016). When proper training is provided for participants and facilitators, intergenerational programs are feasible, straightforward, inexpensive and beneficial for older adults (Canedo-García, García-Sánchez, & Pacheco-Sanz, 2017), and even for those experiencing cognitive decline and dementia (Chung, 2009; Galbraith, Larkin, Moorhouse, & Oomen, 2015; Gualano et al., 2018). Intergenerational programs can leverage the strengths of elders to support the development of teenagers, and benefit the elders in the process.

For intergenerational programming to be effective, it is important to follow best practices. For example, our study offered proper training for participants and practitioners, which oriented them to address stereotypes about age (Jarrott, 2011; Larkin & Rosebrook, 2002). The program's length, having adolescents choose their partner, and the performative aspect of publicly reading a tribute, were designed to promote emotional investment and make the program more attractive to adolescents (Epstein & Boisvert, 2006). Recruiting adolescent and older adult participants from

the same neighborhoods made participation convenient, and generated credibility and trust among the participants (Small, 2009). Though in-person administration is preferred, this approach could be extended by the use of inclusive technology supporting meaningful engagement (Boger & Mercer, 2017), and some have suggested that well constructed online programs can have similarly beneficial outcomes (Canedo-García et al., 2017).

This work, though modest, is important. Adolescents and seniors are among the groups with the highest rates of social isolation (Twenge et al., 2019) and lowest rates of mental health (Mojtabai, Olfson, & Han, 2016; Reynolds, Pietrzak, El-Gabalawy, Mackenzie, & Sareen, 2015). Across ages, individuals' sense of purpose, also called generativity among the elderly, is an important predictor of health and life expectancy (Steptoe, Deaton, & Stone, 2015). Our findings are consistent with work showing that among older adults, cognitive functioning is supported by social engagement (James, Wilson, Barnes, & Bennett, 2011; Krueger et al., 2009). Especially given the low cost of this intervention and its adaptability to any community, our study suggests the utility and promise of intergenerational storytelling programs. Taken together, our study along with others (e.g. Mager, 2019), provide compelling evidence that opportunities for relationship-based reflection can promote healthy development, recuperation of social capital and flourishing of communities (Morita & Kobayashi, 2013; Murayama, Murayama, Hasebe, Yamaguchi, & Fujiwara, 2019).

In many ways, our project opens as many questions as it answers. The finding that adolescents' changes in purpose-in-life were mediated by their developing propensity to formulate values-based goals underscores the importance of opportunities for high-level reflection in this age group (Immordino-Yang, 2016); the implications of this finding should be more broadly investigated in schools and further work in this vein is needed. Further work is also

needed to study how such programming could be integrated into school activities by practitioners and school administrators. Storytelling could expand the repertoire of educational practices that promote social-emotional learning and vocational mentorship, contributing to enriching the social and community orientation of schools. Viable, evidence-based programming that establishes partnerships with community members and community-based organizations is a known way to make schools and communities stronger (DeVore, Winchell, & Rowe, 2016).

Overall, though much is left to be done, this work underscores the promise of intergenerational programs in community settings. Both adolescents and older adults are in need of social connection (Hawkley et al., 2014; Twenge, Spitzberg, & Campbell, 2019); setting them up to support each other seems like an obvious strategy for building community social resources. By engaging a grassroots-style small opportunity-cost program, intergenerational storytelling activities leverage the natural power of conversations and relationships, and are culturally sensitive for a range of users (Palacios et al., 2015). This intervention approach mirrors opportunities for cultivating purpose and virtues that adolescents and older adults are likely to find in natural relationships, but that may be lacking in the modern age.

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