The Arts as a Catalyst for Human Prosociality and Cooperation

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Abstract

We tested the hypothesis that engagement in the arts may act as a catalyst that promotes prosocial cooperation. Using "Understanding Society" data (a nationally representative longitudinal sample of 30,476 people in the UK), we find that beyond major personality traits, demographic variables, wealth, education, and engagement in other social activity (sports), people's greater engagement with the arts predicts greater prosociality (volunteering and charitable giving) over a period of 2 years. The predictive effect of prosociality on subsequent arts engagement is significantly weaker. The evidence is consistent with the hypothesis that the arts provide an important vehicle for facilitating a cohesive and sustainable society. Fostering a society in which engagement in the arts is encouraged and accessible to all may provide an important counter to economic, cultural, and political fracture and division.

Keywords

arts engagement, prosocial behavior, citizenship, cohesion, creativity

> The arts and sciences, essential to the prosperity of the State and to the ornament of human life, have a primary claim to the encouragement of every lover of his country and mankind. (George Washington)
>
> Politicians don't bring people together. Artists do. (Richard Daley 43rd and 5 times elected Mayor of Chicago)

Prosocial cooperation is a fundamental requirement for human survival. A cooperator is someone who pays a cost for another individual to receive a benefit. Indeed, a population of only cooperators has the highest average fitness (payoff), while a population of only defectors (who bear no cost and do not distribute benefits) has the lowest. Nevertheless, in any mixed population, individual defectors have a higher average fitness than individual cooperators (Nowak, 2006). Thus, while humans do frequently and intuitively engage in prosociality (Crockett, Kurth-Nelson, Siegel, Dayan, & Dolan, 2014; Jordan, Hoffman, Nowak, & Rand, 2016; Nowak, 2006), there is a clear tension between individual-level and group-level benefit. This tension creates significant challenges in motivating people to address global and societal problems including environmental degradation, humanitarian crises, economic downturns, and inequality (Meleady, Hopthrow, & Crisp, 2013).

Given the necessity of cooperation for human survival, it becomes essential to understand how it can be maximized (Van de Vyver & Abrams, 2017). Among animal species, one-on-one grooming releases endorphins and encourages bonding and hence maximizes the conditions for cooperation to occur (Keverne, Martenz, & Tuite, 1989; Machin & Dunbar, 2011).

However, given that humans live in much larger, and often in multiple, nested or intersecting groups, there is insufficient resource to rely on one-on-one interactions for bonding and cooperation, but it can arise psychologically. For example, holding a shared social identity with another significantly enhances cooperation (Abrams, Van de Vyver, Pelletier, & Cameron, 2015; Balliet, Wu, & De Dreu, 2014; Levine, Cassidy, Brazier, & Reicher, 2002).

Artistic practices occur cross-culturally as well as historically, and it has been contended that artistic expression is part of an evolutionary mechanism for creating and maintaining such social ties within humans (Weinstein, Launay, Pearce, Dunbar, & Stewart, 2016). Any person in any part of the world can engage in the arts in one way or another and can hence establish shared meaning through the experience or creation of arts. These psychological connections can potentially transcend parochial group memberships as well as those based on nationality, race, and gender. Empirical evidence on specific art forms (e.g., singing, dance, reading, theater) shows that artistic engagement promotes social bonding (Abrams, 2009; Pearce, Launay, & Dunbar, 2015; Tarr, Launay, Cohen, &

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Dunbar, 2015; Weinstein et al., 2016), perspective taking and empathy (Bormann & Greitemeyer, 2015; Day, 2002; Mar, Oatley, Hirsh, dela Paz, & Peterson, 2006), and prosocial responses (Cirelli, Einarson, & Trainor, 2014; Greitemeyer, 2009; Wiltermuth & Heath, 2009). However, most of this evidence focuses on separate art forms and specific groups (e.g., young people, students, specific community groups) often involving small samples from which evidence cannot be generalized to the wider population (Broadwood, Bunting, Andrews, Abrams, & Van de Vyver, 2012). In the current article, we empirically examine the very important wider question of whether arts engagement as a whole is associated with societal prosocial behavior, broadly conceived as a commitment to care for others. Specifically, we test the proposition that arts engagement may be a plausible and distinctively powerful social catalyst for promoting prosociality.

The Current Research

Drawing on a longitudinal data set of the latest available representative sample of the UK population ($N = 30,476$; Understanding Society survey), we test the strength and stability of the relationship between individuals' arts engagement and their prosociality. The longitudinal data set enables us to test the strength and stability of this relationship in a number of ways.

First, we wish to establish for the first time whether there is a reliable and substantively meaningful relationship between arts engagement and prosociality. Second, we aim to determine whether that relationship may be an artifact of the plausible effects of an array of sociodemographic and personality variables. For example, we examine the roles of individuals' religiosity, education, and personality (e.g., openness). Specifically, a person's capacity for arts engagement and their prosociality (e.g., charitable giving) could both depend on their material circumstances such as personal wealth. Furthermore, their inclination to engage in arts and their prosociality might both stem from core aspects of their personality. Separate studies have indicated that openness, agreeableness, and conscientiousness are associated, albeit to different extents, with arts engagement or with prosociality (Carlo, Okun, Knight, & de Guzman, 2005; Diessner, Iyer, Smith, & Haidt, 2013; Habashi, Graziano, & Hoover, 2016; Nusbaum & Silvia, 2011; Thomas, Silvia, Nusbaum, Beaty, & Hodges, 2016). Our contention is that arts engagement itself promotes a prosocial orientation that is influential even after accounting for these sociodemographic and personality variables.

Third, we use a different form of social connectedness measured in the survey to examine whether the relationship between arts engagement and prosociality is distinctive. Specifically, if social connectedness per se is the driver of prosociality, then sports engagement should have a similar effect. However, because sports generally involve competitive social comparisons, are goal oriented, and often gender- or age-specific, unlike arts engagement, we do not expect sports participation to have a generally positive relationship with prosociality.

Fourth, we examine the stability and plausible causal direction of the relationship between arts engagement and prosociality by testing whether the relationship holds over time and after controlling for other variables that might vary over time. This illuminates the question of whether the effects of arts engagement may be sustainable and possibly cumulative rather than merely involving short-term effects. Because we view shared meaning as a deep and enduring psychological resource that is created and sustained through arts engagement, a sustained effect of arts engagement would be consistent with our hypothesis that the effects are general.

Method

Sample

The data are from the Economic and Social Research Council's "Understanding Society" nationally representative annual longitudinal household panel survey, which is the largest of its kind, in the UK (England, Scotland, Wales, and Northern Ireland). The survey is managed by Institute for Social and Economic Research (ISER) and administered by NatCenSocial Research, and data are available through open access from UK Data Service (http://dx.doi.org/10.5255/UKDA-SN-6676-5; ISER, 2015). Data are collected predominantly through face-to-face computer-aided personal interviews (with a very small minority of telephone-based interviews).

Of the five waves of Understanding Society (Knies, 2015), four contain questions relevant to the current article. Wave 2 (W2, 2010–2011) measured individual's art engagement, charitable giving, and volunteering. Wave 3 (W3, 2011–2012) measured individual's personality. Wave 4 (W4, 2012–2013) repeated measurements of individual's charitable giving and volunteering. Wave 5 (W5, 2013–2014) repeated measurements of arts engagement (see Table S1).

W2 sampled 30,476 households. Because some households had more than one participant, we randomly selected one individual per household. The mean age of the sample is 48.84 years ($SD = 18.64$). Of the sample, 56.4% is female and 43.5% is male; 82.9% is White, 6.8% is Asian, 4% is Black, and 1.4% is of mixed heritage; and 50.9% of the sample belong to a religion and 39.6% do not belong to a religion. Of the sample, 16.6% have no qualification and 21.2% have a degree. Average monthly labor income (gross) is £1,025.26 ($SD = 1,584.02$). In the preceding 12 months, 63.6% reported having given to charity, 17.9% reported having volunteered their time, 71% had participated in one or more arts activities, and 66.4% had attended one or more arts events (for further information on sampling as well as attrition, see https://www.understandingsociety.ac.uk).

Measures

Arts participation. Participants indicated whether (yes or no) they had participated in a range of 14 activities (e.g., dancing, painting) in the last 12 months. Frequency of participation was measured with the question "you said you have done [list of arts

activities mentioned by participant]. Thinking about [list], how often in the last 12 months have you done activities like this?" Participants responded from 1 (*once in past year*) to 5 (*at least once a week*). For the purposes of the analyses, this frequency score is coded to include those who did not participate in any arts activities (0 = *not once in past year*). This overall arts participation frequency score is used in the analyses below.

Arts attendance. Participants were asked whether (yes or no) they had attended any of 14 types of arts events (e.g., opera/operetta, circus) in the last 12 months. Participants were then asked "You said you have been to [list of arts events mentioned by participant]. Thinking about [list], how often in the last 12 months have you been to events such as this?" Participants responded from 1 (*once in past year*) to 5 (*at least once a week*). This frequency score was coded to include those who did not participate in any arts activities (0 = *not once in past year*). This overall arts attendance frequency score is used in the analyses below.

Arts attendance and arts participation correlated significantly with one another ($r = .31, p < .001$), but as their relationship was only moderate and as arts attendance and arts participation are conceptually distinctive, we analyze them as separate constructs.

Sports engagement. Participants indicated whether (yes or no) they had participated in a range of 29 sports activities (e.g., football, cycling) in the last 12 months. Participants were then asked "You said you have done [list of sports activities mentioned by participant]. Thinking about [list], how often in the last 12 months have you done this?" Participants responded from 1 (*once in past year*) to 7 (*3 or more times a week*). This frequency score was coded to include those who did not participate in any sports activities (0 = *not once in past year*). This overall sports engagement frequency score is used in the analyses below.

Because of the high correlations between the range data (total number) on the one hand, and the frequency data on the other, for arts attendance ($r = .70$), arts participation ($r = .55$), and sports participation ($r = .61$), the analyses that follow report findings for frequency. Analyses substituting range yielded similar results.

Prosociality. The survey measured two well-established forms of self-reported prosocial behavior (Böckler, Tusche, & Singer, 2016). These were people's engagement in charitable giving and volunteering. Charitable giving was measured by asking participants: "in the last 12 months, have you donated any money to charities or other organizations?" (1 = *no*, 2 = *yes*). Volunteering was measured by asking participants: "in the last 12 months, have you given any unpaid help or worked as a volunteer for any type of local, national or international organization or charity?" (1 = *no*, 2 = *yes*). Charitable giving and volunteering correlated significantly with one another ($\Phi = .15, p < .001$), but as their relationship was relatively small and as charitable giving and volunteering are conceptually distinctive, we analyze them as separate constructs.

Personality. The Big Five personality traits are widely regarded as representing the core elements of personality and were measured using the Big Five Inventory-Short Scale (Lang, John, Lüdtke, Schupp, & Wagner, 2011; see also Laakasuo, Rotkirch, Berg, & Jokela, 2017). Where there are obvious directional predictions, we indicate the likely positive or negative direction of relationship with prosociality and/or arts engagement with either + or −.

Agreeableness (+) was measured using 3 items. Participants were asked to rate the extent to which they see themselves as "someone who is sometimes rude to others" (reverse-scored), "someone who has a forgiving nature," and "someone who is considerate and kind to almost everyone." *Extroversion* (+) was measured using 3 items. Participants were asked to rate the extent to which they see themselves as "someone who is talkative," "someone who is outgoing, sociable," and "someone who is reserved" (reverse-scored). *Conscientiousness* (+) was measured using 3 items. Participants were asked to rate the extent to which they see themselves as "someone who does a thorough job," "someone who tends to be lazy" (reverse-scored), and "someone who does things efficiently." *Neuroticism* was measured using 3 items. Participants were asked to rate the extent to which they see themselves as "someone who worries a lot," "someone who gets nervous easily," and "someone who is relaxed, handles stress well" (reverse-scored). *Openness* (+) was measured using 3 items. Participants were asked to rate the extent to which they see themselves as "someone who is original, comes up with new ideas," "someone who values artistic, aesthetic experiences," and "someone who has an active imagination." Participants responded from 1 (*does not apply to me at all*) to 7 (*applies to me perfectly*).

Control variables. Control variables were chosen based on the plausibility that they would relate either to arts engagement and/or to prosociality (Böckler et al., 2016; Wilson & Musick, 1997). These were as follows: *gender* (coded as 1 = *male*, 2 = *female*), *ethnicity* (dummy coded as White, Asian, or Black with "other" representing the reference category), *marital status* (coded as 0 = *single/widowed*, 1 = *married/living as a couple/civil partnership*), *education* (+; coded from 1 = *no qualification* to 6 = *holding a degree on a 6-point scale*), *labor income* (+; total monthly labor income was the sum of wages, self-employment income, and pay in the second job; it was top-coded at ±15,000 to prevent erroneous outliers), *personal income* (+; total monthly personal income was the sum of wages, self-employment earnings, second job earnings, interest and dividends, pensions, benefits, and other income sources such as educational grants; it was top-coded at ±15,000 to prevent erroneous outliers), *monthly savings* (+; total monthly savings ranged from £0 to £4,000), *employment status* (dummy coded as employed, unemployed, or self-employed, with "other" acting as the reference category), *working hours pattern* (coded as 0 = *not applicable*, 1 = *part-time*, 2 = *full-time*), *religiosity* (+; coded as 1 = *not religious*, 2 = *religious*), *health* (+; coded from 1 = *excellent* to 5 = *poor on a 5-point scale*),

urban versus rural living (coded as 1 = *urban*, 2 = *rural*), *geographical location* (dummy coded using the 12 regions of Britain with London acting as the reference category), *month interviewed* (dummy coded using the 12 months of the year, with December acting as the reference category), *household context* indicated by the *number of children* aged under 2, 3 to 4, 5 to 11 and 12 to 15 in the household, the *number of adults* in the household, and *tenure status* (+; coded from 1 to 5 as follows: rent-free, rented, shared ownership, owned on mortgage, or owned outright). All questionnaires are available via https://www.understandingsociety.ac.uk/documentation/mainstage

Results

Statistical Plan

We analyze the data set as follows. First, to explore the hypothesized positive relationships between arts engagement (attendance and participation) and prosociality (charitable giving and volunteering) (Hypothesis 1), we employed W2 data to conduct preliminary correlation analyses. Second, to explore the hypothesis that the relationships between arts engagement and prosociality should exist after accounting for other plausible predictors (Hypothesis 2), we employed W2 data to conduct logistic regression analyses. Third, to test whether arts engagement has a distinctive and larger effect than sports engagement (Hypothesis 3), we compare the effects associated with each. Fourth, to test the hypothesis that the relationships between arts engagement and prosociality should hold over time (Hypothesis 4), we employed W2 and W4 data to conduct logistic regression analyses. Fifth, to examine whether the prospective effect of W2 arts engagement on W4 prosociality plausibly has greater causal impact than the reverse direction (Hypothesis 5), we conduct a series of lagged analyses using W2–W5 data.

Logistic regression analysis produces only unstandardized coefficients. To enable comparisons of predictive effects, standardized variables are employed throughout analyses. W2 sociodemographic variables are used in the analyses, and it is assumed that they remain largely consistent over time. All analyses (excluding preliminary correlation analyses) include the sociodemographic variables and the sports participation variable as additional predictors. Because personality was only measured in W3, it is included as an additional predictor when examining prosociality at W4 (but not when examining prosociality at W2). Due to space limitations, we will not report coefficients in text that are already reported in the tables.

Correlation Analyses (W2)

Consistent with Hypothesis 1, bivariate correlation analyses showed that arts participation correlated significantly with charitable giving and volunteering ($r_{\text{charitable giving}}$ = .23, $p < $ .001; $r_{\text{volunteering}}$ = .16, $p < $ .001), as did arts attendance ($r_{\text{charitable giving}}$ = .19, $p < $ .001; $r_{\text{volunteering}}$ = .20, $p < $ .001). Furthermore, partial correlation analyses showed that, when accounting for arts participation, arts attendance continued to correlate with charitable giving (r = .13, $p < $ .001) and volunteering (r = .16, $p < $ .001). When accounting for arts attendance, arts participation continued to correlate with charitable giving (r = .19, $p < $ .001) and volunteering (r = .11, $p < $ .001; see Tables S2–S5 for detailed correlation analyses).

Arts and Prosociality (W2)

Charitable giving. Results of the logistic regression analysis testing the predictive effects of arts attendance, arts participation, sports participation, and sociodemographic variables revealed a significant overall model. Consistent with Hypothesis 2, even when accounting for all of sociodemographic variables and sports participation, charitable giving was predicted by both arts attendance and arts participation (see Table 1).

Moreover, statistically comparing the regression coefficients of all predictors revealed that arts engagement was among the strongest predictors. Indeed, there were larger effects only involving age, $t_{\text{participation}}(25{,}052) = -20.43$, $p < $ .001, d = .26; $t_{\text{attendance}}(25{,}052) = -25.02$, $p < $ .001, d = .32, and monthly savings, $t_{\text{attendance}}(25{,}052) = -2.31$, $p < $ .001, d = .03, and when these effects were accounted for, the arts engagement variables were stronger predictors of volunteering than all remaining variables (all $ts_{\text{participation}} > 6.23$, $ps < $ .001, $ds > $ .07; $ts_{\text{attendance}} > 4.74$, $ps < $ .001, $ds > $ .06).

Volunteering. The logistic regression analysis testing the predictive effects of arts attendance, arts participation, sports participation, and sociodemographic variables revealed a significant overall model. Consistent with Hypothesis 2, even when accounting for sociodemographic variables and sports participation, volunteering was significantly predicted by both arts attendance and arts participation (see Table 2).

Moreover, the regression coefficients for arts engagement were among the strongest predictors of volunteering. There were larger effects only involving educational level, $t_{\text{participation}}(25{,}058) = -18.05$, $p < $ .001, d = .23; $t_{\text{attendance}}(25{,}058) = -3.73$, $p < $ .001, d = .05, and when these effects were accounted for, the arts engagement variables were stronger predictors of volunteering than all remaining variables (all $ts_{\text{participation}} > 6.06$, $ps < $ .001, $ds > $ .07; all $ts_{\text{attendance}} > $ 22.78, $ps < $ .001, $ds > $ .28).

Distinctiveness of arts engagement. To directly test whether the arts–prosociality relationships were different from and larger than the sports–prosociality relationships, we compared the coefficients from the W2 regression analyses. Consistent with Hypothesis 3, charitable giving was predicted significantly more strongly by arts engagement than by sports engagement, $t_{\text{attendance}}(25{,}052) = 10.18$, $p < $ .001, d = .13; $t_{\text{participation}}(25{,}052) = 12.88$, $p < $ .001, d = .16. Similarly, volunteering was more strongly predicted by arts engagement than by sports engagement, $t_{\text{attendance}}(25{,}058) = 21.03$, $p < $ .001, d = .27; $t_{\text{participation}}(25{,}058) = 9.90$, $p < $ .001, d = .13.

Table 1. Results of the Logistic Regression Analysis Testing the Predictive Effects of Arts Engagement on Charitable Giving (W2).

Block 1	B (SE)	DV = W2 Charitable Giving $\chi^2(2)$ = 1,773.68, p < .001, Nagelkerke R^2 = .10.		
		Wald	OR [95% CIs]	r
W2 arts attendance	.30 (.02)***	428.44	1.36 [1.32, 1.40]	.33
W2 arts participation	.40 (.01)***	811.27	1.49 [1.45, 1.53]	.36
Block 2		$\chi^2(46)$ = 3,141.85, p < .001, Nagelkerke R^2 = .25		
W2 arts attendance	.26 (.02)***	210.11	1.30 [1.26, 1.35]	.32
W2 arts participation	.27 (.02)***	304.73	1.31 [1.27, 1.35]	.32
W2 sports engagement	.16 (.02)***	77.23	1.17 [1.13, 1.21]	.29
W2 gender	.17 (.02)***	105.77	1.18 [1.15, 1.22]	.29
W2 whether White	.10 (.03)**	9.99	1.11 [1.04, 1.18]	.28
W2 whether Asian	.09 (.03)***	12.19	1.10 [1.04, 1.16]	.27
W2 whether Black	−.01 (.02)	0.37	0.99 [0.94, 1.03]	.25
W2 age	.43 (.03)***	290.21	1.53 [1.46, 1.61]	.37
W2 marital status	.10 (.02)***	25.95	1.11 [1.07, 1.15]	.28
W2 education	.22 (.02)***	132.46	1.24 [1.20, 1.29]	.31
W2 labor income	−.02 (.05)	0.19	0.98 [0.89, 1.07]	.26
W2 personal income	.22 (.04)***	34.76	1.25 [1.16, 1.35]	.31
W2 monthly savings	.28 (.02)***	240.70	1.32 [1.27, 1.36]	.32
W2 whether employed	.05 (.04)	2.06	1.05 [0.98, 1.13]	.26
W2 whether unemployed	−.11 (.02)***	52.92	0.90 [0.87, 0.92]	.27
W2 whether self-employed	.04 (.02)	2.78	1.04 [0.99, 1.09]	.26
W2 whether religious	.17 (.02)***	103.74	1.18 [1.15, 1.22]	.29
W2 general health	.02 (.02)	0.97	1.02 [0.98, 1.05]	.26
W2 whether rural/urban	.02 (.02)	1.33	1.02 [0.99, 1.05]	.26
W2 whether work full-time	.03 (.04)	0.43	1.03 [0.95, 1.11]	.26
W2 number of children under 2 years in household	−.01 (.02)	0.09	1.00 [0.97, 1.03]	.25
W2 number of children aged 3–4 years in household	.01 (.02)	0.25	1.01 [0.98, 1.04]	.25
W2 number of children aged 5–11 years in household	−.001 (.02)	0.004	1.00 [0.97, 1.03]	.25
W2 number of children aged 12–15 years in household	−.02 (.02)	2.09	0.98 [0.95, 1.01]	.26
W2 number of adults in household	−.05 (.02)**	7.25	0.95 [0.91, 0.99]	.26
W2 whether house is owned	.20 (.02)***	144.98	1.23 [1.19, 1.27]	.30

Note. All predictors and covariates are standardized, thus *B*s represent standardized values. Other covariates not included in the table were region they live in (dummy coded each region) and month of interview (dummy coded each month). Labor income, personal income, monthly savings, urban living, and number of adults in household were log transformed. The minimum value below 0 plus 1.0 was added to all labor income, personal income, and monthly savings values prior to log transformation. When the range rather than frequency measures are used for arts attendance and participation, and sports attendance, their (Block 2) respective effects are as follows: $B_{\text{arts participation}}$ = .19***, SE = .02, OR = 1.20; $B_{\text{arts attendance}}$ = .36***, SE = .02, OR = 1.43; $B_{\text{sports participation}}$ = .26***, SE = .02, OR = 1.30. W2 = Wave 2; OR = odds ratio; SE = standard error; CI = confidence interval; DV = dependent variable.
*p < .05. **p < .01. ***p < .001.

Arts and Prosociality (W2–W4)

Charitable giving. Logistic regression analysis was employed to examine whether arts attendance and arts participation (measured at W2) predicted charitable giving measured 2 years later (W4). Additional predictors/control variables were W2 charitable giving, W2 sociodemographics, W2 sports engagement, and W3 personality. Bivariate correlations between personality on the one hand and arts engagement and prosociality on the other are reported in Table S2. Notably, core aspects of personality (openness, agreeableness, extroversion, and conscientiousness) correlated significantly with both prosociality and arts engagement.

The logistic regression revealed a significant overall model. Consistent with Hypothesis 4, even when accounting for levels of charitable giving, sociodemographics, and sports participation 2 years earlier (W2), and for personality 1 year earlier

(W3), charitable giving at W4 was predicted by both W2 arts attendance and W2 arts participation (see Table 3).

Volunteering. A comparable logistic regression analysis on volunteering revealed a significant overall model. Consistent with Hypothesis 4, even when accounting for levels of volunteering, sociodemographics, and sports participation 2 years earlier (W2), and for personality 1 year earlier (W3), W4 volunteering was significantly predicted by both W2 arts attendance and W2 arts participation (see Table 4).

Additional analyses. To test with greater confidence that the prospective effect of W2 arts engagement on W4 prosociality was not spurious, we added further covariates in the logistic regression analyses. These were W2 demographics that could

Table 2. Results of the Logistic Regression Analysis Testing the Predictive Effects of Arts Engagement on Volunteering (W2).

| Block 1 | B (SE) | DV = W2 Volunteering $\chi^2(2) = 1,326.93$, $p < .001$, Nagelkerke $R^2 = .09$. | | |
		Wald	OR [95% CIs]	r
W2 arts attendance	.45 (.02)***	586.97	1.57 [1.52, 1.63]	.32
W2 arts participation	.38 (.02)***	310.94	1.46 [1.40, 1.52]	.30
Block 2		$\chi^2(46) = 1,107.79$, $p < .001$, Nagelkerke $R^2 = .15$.		
W2 arts attendance	.37 (.02)***	281.75	1.44 [1.38, 1.50]	.29
W2 arts participation	.24 (.02)***	116.05	1.28 [1.22, 1.33]	.26
W2 sports engagement	.15 (.02)***	52.32	1.16 [1.11, 1.21]	.24
W2 gender	.05 (.02)**	8.25	1.06 [1.02, 1.10]	.22
W2 whether White	.06 (.04)	2.03	1.06 [0.98, 1.15]	.22
W2 whether Asian	−.04 (.03)	1.19	0.96 [0.90, 1.03]	.22
W2 whether Black	.04 (.03)	2.40	1.04 [0.99, 1.10]	.22
W2 age	.13 (.03)***	18.15	1.14 [1.07, 1.21]	.23
W2 marital status	−.01 (.02)	0.15	0.99 [0.95, 1.04]	.21
W2 education	.41 (.02)***	353.30	1.50 [1.44, 1.57]	.30
W2 labor income	−.08 (.04)*	4.38	0.92 [0.85, 1.00]	.22
W2 personal income	.09 (.03)*	6.18	1.09 [1.02, 1.16]	.23
W2 monthly savings	.04 (.02)*	4.90	1.04 [1.01, 1.08]	.22
W2 whether employed	−.11 (.04)**	7.31	0.90 [0.83, 0.97]	.23
W2 whether unemployed	−.03 (.02)	2.24	0.97 [0.93, 1.01]	.21
W2 whether self-employed	.04 (.02)	3.28	1.05 [1.00, 1.10]	.22
W2 whether religious	.19 (.02)***	101.54	1.21 [1.17, 1.26]	.25
W2 general health	−.06 (.02)**	9.87	0.94 [0.90, 0.98]	.22
W2 whether rural/urban	.12 (.02)***	45.19	1.13 [1.09, 1.17]	.23
W2 whether work full-time	−.17 (.05)***	14.02	0.85 [0.76, 0.92]	.24
W2 number of children under 2 years in household	−.13 (.02)***	32.77	0.88 [0.84, 0.92]	.23
W2 number of children aged 3–4 years in household	−.02 (.02)	0.62	0.99 [0.95, 1.02]	.21
W2 number of children aged 5–11 years in household	.03 (.02)	2.95	1.03 [1.00, 1.07]	.21
W2 number of children aged 12–15 years in household	.04 (.02)*	4.34	1.04 [1.00, 1.08]	.22
W2 number of adults in household	.05 (.02)*	4.13	1.05 [1.00, 1.10]	.22
W2 whether house is owned	.07 (.02)**	11.28	1.08 [1.03, 1.12]	.22

Note. All predictors and covariates are standardized, thus Bs represent standardized values. Other covariates not included in the table were region they live in (dummy coded each region) and month of interview (dummy coded each month). Labor income, personal income, monthly savings, urban living, and number of adults in household were log transformed. The minimum value below 0 plus 1.0 was added to all labor income, personal income, and monthly savings values prior to log transformation. When the range rather than frequency measures are used for arts attendance and participation, and sports attendance, their (Block 2) respective effects are as follows: $B_{arts\ participation} = .27^{***}$, $SE = .02$, $OR = 1.31$; $B_{arts\ attendance} = .33^{***}$, $SE = .02$, $OR = 1.39$; $B_{sports\ participation} = .16^{***}$, $SE = .02$, $OR = 1.17$. W2 = Wave 2; W4 = Wave 4; OR = odds ratio; SE = standard error; CI = confidence interval; DV = dependent variable.
*$p < .05$. **$p < .01$. ***$p < .001$.

feasibly vary between W2 and W4 and which at W2 significantly predicted prosociality. Inclusion of W4 covariates helps to eliminate the possibility that these acted as third variables that affected both arts engagement and prosociality at W4 and which could account for their stable associations over time. Consistent with our hypotheses, the effects of W2 arts engagement on W4 prosociality remained significant (see Supplemental Materials for details; Tables S6 and S7).

Comparison of Causal Direction

Arts engagement was not measured in W4 but was measured in W5. To assess the plausibility of the hypothesized causal direction from arts engagement on prosociality, we tested a reverse lagged analysis, using W2 and W5 (instead of W4) data (see Table S8 for data configuration). Specifically, we tested whether W2 prosociality predicted W5 arts engagement while

accounting for W2 sociodemographics, W2 sports engagement, W3 personality, and W5 sociodemographics. W5 sociodemographics were included if they predicted arts engagement at W2 and if they could feasibly change over time. W2 charitable giving and volunteering did significantly, but relatively weakly, predict W5 arts engagement, consistent with a virtuous circle. Specifically, W5 arts participation was predicted by W2 charitable giving ($\beta = .05$, $SE = .01$, $t = 5.97$, 95% confidence interval [CI] for". Please check if the edit is correct.] β [.03, .06], $p < .001$) and W2 volunteering ($\beta = .04$, $SE = .01$, $t = 5.65$, 95% CI for β [.03, .05], $p < .001$), overall model, $F(79, 15,212) = 71.29$, $p < .001$, $R^2 = .27$. Similarly, W5 arts attendance was significantly predicted by W2 charitable giving ($\beta = .03$, $SE = .01$, $t = 4.79$, 95% CI for β [.02, .05], $p < .001$) and W2 volunteering ($\beta = .04$, $SE = .01$, $t = 5.70$, 95% CI for β [.02, .05], $p < .001$), overall model $F(79, 15,214) = 133.20$, $p < .001$, $R^2 = .41$ (see Tables S9 and S10).

Table 3. Results of the Logistic Regression Analysis Testing the Predictive Effects of Arts Engagement (W2) on Charitable Giving (W4).

Block 1	B (SE)	Wald	OR [95 CIs]	r
		DV = W4 Charitable Giving $\chi^2(2) = 709.81$, $p < .001$, Nagelkerke $R^2 = .06$.		
W2 arts attendance	.27 (.02)***	203.23	1.30 [1.26, 1.35]	.31
W2 arts participation	.32 (.02)***	310.78	1.37 [1.33, 1.42]	.32
Block 2		$\chi^2(52) = 3,402.12$, $p < .001$, Nagelkerke $R^2 = .31$.		
W2 arts attendance	.12 (.02)***	24.07	1.13 [1.07, 1.18]	.27
W2 arts participation	.10 (.02)***	23.30	1.11 [1.06, 1.16]	.27
W2 sports engagement	.05 (.02)*	3.92	1.05 [1.00, 1.10]	.25
W2 gender	.17 (.02)***	58.65	1.19 [1.14, 1.24]	.28
W2 whether White	.07 (.05)	2.29	1.07 [0.98, 1.17]	.26
W2 whether Asian	.05 (.04)	1.76	1.05 [0.98, 1.14]	.25
W2 whether Black	.01 (.03)	0.07	1.01 [0.95, 1.07]	.24
W2 age	.25 (.04)***	51.99	1.29 [1.20, 1.38]	.31
W2 marital status	.07 (.03)**	6.92	1.07 [1.02, 1.13]	.26
W2 education	.19 (.03)***	58.65	1.21 [1.15, 1.27]	.29
W2 labor income	.01 (.06)	0.03	1.01 [0.90, 1.14]	.24
W2 personal income	.14 (.05)**	8.62	1.15 [1.05, 1.26]	.28
W2 monthly savings	.12 (.02)***	27.05	1.12 [1.08, 1.17]	.27
W2 whether employed	−.04 (.05)	0.72	0.96 [0.88, 1.05]	.25
W2 whether unemployed	−.03 (.02)	1.70	0.97 [0.94, 1.01]	.25
W2 whether self-employed	−.04 (.03)	1.50	0.97 [0.91, 1.02]	.25
W2 whether religious	.16 (.02)***	55.63	1.17 [1.13, 1.22]	.28
W2 general health	−.06 (.02)**	7.66	0.94 [0.90, 0.98]	.26
W2 whether rural/urban	.05 (.02)*	4.99	1.05 [1.01, 1.09]	.25
W2 whether work full-time	.02 (.05)	0.19	1.02 [0.92, 1.13]	.25
W2 number of children under 2 years in household	−.001 (.02)	0.001	1.00 [0.96, 1.04]	.24
W2 number of children aged 3–4 years in household	.003 (.02)	0.02	1.00 [0.96, 1.04]	.24
W2 number of children aged 5–11 years in household	.02 (.02)	0.72	1.02 [0.98, 1.06]	.25
W2 number of children aged 12–15 years in household	.01 (.02)	0.06	1.01 [0.97, 1.05]	.24
W2 number of adults in household	−.06 (.03)*	4.42	0.94 [0.89, 1.00]	.26
W2 whether house is owned	.17 (.02)***	53.36	1.18 [1.13, 1.24]	.28
W2 charitable giving	.78 (.02)***	1,601.25	2.18 [2.10, 2.26]	.48
W3 agreeableness	.05 (.02)*	6.38	1.06 [1.01, 1.10]	.26
W3 conscientiousness	.01 (.02)	0.05	1.01 [0.96, 1.05]	.24
W3 extroversion	.01 (.02)	0.29	1.01 [0.97, 1.06]	.24
W3 neuroticism	−.01 (.02)	0.08	0.99 [0.95, 1.04]	.24
W3 openness	.06 (.02)*	6.36	1.06 [1.01, 1.10]	.26

Note. All predictors and covariates are standardized, thus *B*s represent standardized values. Other covariates not included in the table were region they live in (dummy coded each region) and month of interview (dummy coded each month). Labor income, personal income, monthly savings, urban living, and number of adults in household were log transformed. The minimum value below 0 plus 1.0 was added to all labor income, personal income, and monthly savings values prior to log transformation. W2 = Wave 2; W3 = Wave 3; W4 = Wave 4; OR = odds ratio; SE = standard error; CI = confidence interval; DV = dependent variable.
*$p < .05$. **$p < .01$. ***$p < .001$.

Note that, although the time lag (W2–W5) is longer for the reverse path, the stability of arts participation between W2 and W4 ($r = .47$, $p < .001$, $N = 19,327$) is very similar to that of volunteering between W2 and W5 ($r = .49$, $p < .001$, $N = 21,264$). *Z*-tests comparing the size of regression coefficients showed that the *arts engagement to prosociality* relationships were significantly stronger than the *prosociality to arts engagement* relationships. Specifically, the arts participation to charitable giving path ($B = .10$, $SE = .02$) was significantly stronger than the reversed path ($B = .05$, $SE = .01$, $Z = 2.24$, $p = .025$, $d = .04$). The arts participation to volunteering path ($B = .11$, $SE = .03$) was significantly stronger than the reversed path ($B = .04$, $SE = .01$, $Z = 2.21$, $p = .027$, $d = .04$). The arts attendance to charitable giving path ($B = .10$, $SE = .03$) was

significantly stronger than the reversed path ($B = .03$, $SE = .01$, $Z = 2.21$, $p = .027$, $d = .04$). The arts attendance to volunteering path ($B = .20$, $SE = .03$) was significantly stronger than the reversed path ($B = .04$, $SE = .01$, $Z = 4.12$, $p < .001$, $d = .07$). These findings are consistent with Hypothesis 5 that arts engagement is likely to have a stronger effect on prosociality than prosociality is on arts engagement.

Discussion

Drawing on a large nationally representative UK sample, the aim of the present research was to test a hypothesized general relationship between arts engagement and societal prosociality and the plausibility of a hypothesized causal path from one to

Table 4. Results of the Logistic Regression Analysis Testing the Predictive Effects of Arts Engagement (W2) on Volunteering (W4).

Block 1	B (SE)	DV = W4 Volunteering $\chi^2(2) = 715.23, p < .001$, Nagelkerke $R^2 = .07$.		
		Wald	OR [95 CIs]	r
W2 arts attendance	.42 (.02)***	353.03	1.52 [1.46, 1.59]	.32
W2 arts participation	.31 (.03)***	152.43	1.37 [1.30, 1.44]	.29
Block 2		$\chi^2(52) = 3,405.90, p < .001$, Nagelkerke $R^2 = .34$.		
W2 arts attendance	.21 (.03)***	54.53	1.24 [1.17, 1.31]	.26
W2 arts participation	.11 (.03)***	14.84	1.12 [1.06, 1.19]	.24
W2 sports engagement	.09 (.03)***	11.63	1.10 [1.04, 1.16]	.23
W2 gender	.05 (.03)*	3.99	1.05 [1.00, 1.11]	.22
W2 whether White	−.07 (.05)	1.81	0.93 [0.84, 1.03]	.23
W2 whether Asian	−.11 (.05)*	5.73	0.89 [0.82, 0.98]	.24
W2 whether Black	−.05 (.04)	1.37	0.96 [0.88, 1.03]	.22
W2 age	.03 (.04)	0.49	1.03 [0.95, 1.12]	.22
W2 marital status	.06 (.03)	3.43	1.06 [1.00, 1.14]	.23
W2 education	.26 (.03)***	79.97	1.30 [1.22, 1.37]	.27
W2 labor income	−.12 (.05)*	5.56	0.89 [0.80, 0.98]	.24
W2 personal income	.14 (.05)**	9.17	1.14 [1.05, 1.25]	.24
W2 monthly savings	.05 (.02)*	4.83	1.05 [1.01, 1.10]	.22
W2 whether employed	.06 (.05)	1.09	1.06 [0.95, 1.17]	.23
W2 whether unemployed	.01 (.03)	0.20	1.01 [0.96, 1.07]	.22
W2 whether self-employed	.06 (.03)	3.07	1.06 [0.99, 1.13]	.23
W2 whether religious	.17 (.03)***	47.42	1.19 [1.13, 1.25]	.25
W2 general health	−.02 (.03)	0.31	0.99 [0.93, 1.04]	.22
W2 whether rural/urban	.09 (.02)***	14.56	1.09 [1.04, 1.14]	.23
W2 whether work full-time	−.27 (.06)***	20.87	0.77 [0.68, 0.86]	.26
W2 number of children under 2 years in household	−.02 (.03)	0.56	0.98 [0.93, 1.03]	.22
W2 number of children aged 3–4 years in household	.02 (.02)	0.33	1.01 [0.97, 1.06]	.22
W2 number of children aged 5–11 years in household	.06 (.02)**	6.76	1.07 [1.02, 1.12]	.23
W2 number of children aged 12–15 years in household	−.03 (.03)	1.41	0.97 [0.93, 1.02]	.22
W2 number of adults in household	−.04 (.03)	1.26	0.96 [0.90, 1.03]	.22
W2 whether house is owned	.08 (.03)**	7.11	1.08 [1.02, 1.15]	.23
W2 volunteering	.88 (.02)***	2,351.56	2.41 [2.33, 2.50]	.47
W3 agreeableness	.01 (.03)	0.13	1.01 [0.96, 1.06]	.22
W3 conscientiousness	−.04 (.03)	1.90	0.97 [0.92, 1.02]	.22
W3 extroversion	.03 (.03)	1.37	1.03 [0.98, 1.08]	.22
W3 neuroticism	−.03 (.03)	1.56	0.97 [0.92, 1.02]	.22
W3 openness	.09 (.03)**	11.37	1.09 [1.04, 1.15]	.23

Note. All predictors and covariates are standardized, thus Bs represent standardized values. Other covariates not included in the table were region they live in (dummy coded each region) and month of interview (dummy coded each month). Labor income, personal income, monthly savings, urban living, and number of adults in household were log transformed. The minimum value below 0 plus 1.0 was added to all labor income, personal income, and monthly savings values prior to log transformation. W2 = Wave 2; W3 = Wave 3; W4 = Wave 4; OR = odds ratio; SE = standard error; CI = confidence interval; DV = dependent variable.
*$p < .05$. **$p < .01$. ***$p < .001$.

the other. Although the data are self-report and correlational, they reflect real-time societal data over a period of 4 years from a survey of the very highest rigor and an extremely large scale. Therefore, the size of the observed relationships and the generality and wider value and significance of this evidence are quite remarkable. Our analyses revealed novel and clear evidence for the role of the arts in creating and maintaining society-wide prosociality.

First, cross-sectionally, engagement in the arts predicted prosociality more strongly than, and even after accounting for, a large set of demographic variables such as gender, individual resources such as personal income, core personality such as openness, and sports engagement. Indeed, arts participation

and attendance independently were among the strongest predictors of charitable giving and volunteering. Only age and monthly savings had larger effects than arts engagement on charitable giving and only educational level had a larger effect than arts engagement on volunteering. When these 3 variables were statistically accounted for, arts engagement remained a significantly stronger predictor than all other variables. Second, these predictive effects of arts engagement persisted over time. W2 arts participation and arts attendance independently predicted both prosociality measured at W2 and *increases* in prosociality measured 2 years later, at W4. Across these analyses, all the predictor variables were able to account for between 15% and 31% of the variance in volunteering and

charitable giving. Arts engagement alone accounted for between 6% and 10% or about a third of the explained variance.

Across the analyses, notable variations occurred in the impact of specific sociodemographic and psychological variables on charitable giving and volunteering. As expected, charitable giving was consistently predicted by socioeconomic (or wealth-related) variables including income and savings as well as by education. In contrast, volunteering was consistently predicted by variables seemingly pertaining to spare time, including whether the person worked part-time and how many young children they had, as well as by education. Furthermore, agreeableness and openness both predicted charitable giving, whereas only openness predicted volunteering. Importantly, arts engagement consistently predicted *both* charitable giving and volunteering over and above sociodemographic and personality variables, showing that arts engagement plausibly plays an important and consistent role in promoting these two distinctive prosocial outcomes.

Limitations

Inevitably, the present data and analyses have some important limitations. First, we do not have objective indicators of arts engagement. However, even if the absolute accuracy of self-reports cannot be guaranteed, it seems reasonable to assume that differences in these reports do correspond to differences in actual behavior. The low correlations between the different forms of engagement and between different forms of prosociality as well as their plausible and distinctive relationships with covariates lend greater credibility to this assumption. In addition, the charitable giving measure included reference to "charities or other organizations." Although the context of the question would seem to imply charitable gifts, it is possible that there is some confound with other types of organization. In addition, we are aware that prosociality is only one of several reasons why people volunteer (Clary & Snyder, 1999). Nonetheless, convergence of effects of arts engagement on both the volunteering and donation measures suggests that both were forms of prosociality. We also expect that additional individual difference variables could play a role in arts engagement (e.g., creativity) and prosociality (e.g., empathy).

Although we were able to consider a large set of potentially influential covariates, it remains possible that relationships between arts engagement and prosociality may be explained by the presence of unmeasured third variables or other sources of variance. For example, one of the covariates was respondents' region of residence. We had no theoretical reason to expect proximal regions to be particularly similar or different or for region to moderate the relationships between arts engagement and prosociality. However, we are aware that a more micro-level analysis (e.g., at the ward level) would be likely to reveal effects of spatial dependency (e.g., people in adjacent localities might have access to the same arts or volunteering opportunities). Therefore, although beyond the scope of the present article, an interesting avenue for future research would be to conduct spatial regression analyses (Ward & Gleditsch, 2008) to explore this possibility.

Finally, the survey did not provide scope to examine potential mediators such as social connection that may explain the relationship between arts engagement and prosociality. Therefore, we hope the present powerful evidence will inspire future smaller scale research projects to further examine the psychological mechanisms responsible for the prosocial potential of the arts.

Summary

Overall, the evidence is strongly consistent with the proposition that the arts act as a key social psychological catalyst that can foster and maintain prosociality and with the inference that the arts can make a crucial contribution toward a cohesive and socially prosperous society. The evidence is consistent with theorizing that the arts are beneficial, if not essential, for human survival, shown concretely here in terms of society-wide prosociality through generalized charitable giving and volunteering. An implication of this evidence for policy is the potential for substantial social and economic gains from investing in the arts. It also follows that these may be achieved effectively by policies or investments that make the arts more widely available and ensure that access is not restricted only to the wealthy.

Authors' Note

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