*Article*

# Smoking Households Give Less to Charity

Nonprofit and Voluntary Sector Quarterly
2020, Vol. 49(3) 589–610

DOI: 10.1177/0899764019883950
journals.sagepub.com/home/nvs
SAGE

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## Abstract

This study had two aims: (a) to assess, among households in the United States, the association between spending money on cigarettes and participation in charitable giving, and between spending money on cigarettes and amount spent on charitable giving, and (b) to assess whether the association between smoking and charitable giving is mediated by religiosity, social capital, cognitive aptitude, and happiness. To address these aims, we used data from Consumer Expenditure Interview Survey and Midlife in the United States Survey. The analyses revealed that households that spend money on cigarettes are less likely to participate in charitable giving. Furthermore, among households who do give to charity, smoking households give a lesser amount than others do. Religiosity, social capital, cognitive aptitude, and happiness do not appear to mediate the relationship between smoking and charitable giving.

## Keywords

tobacco expenditure, smoking, participation in charitable giving, amount spend on charitable giving, economics

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## Introduction

Smoking causes an estimated 480,000 deaths in the United States each year (Centers for Disease Control and prevention, 2017; U.S. Department of Health & Human Services, 2014). In addition to health consequences of smoking, spending on cigarettes can negatively affect expenditure patterns of individuals and households in relation to many products and services such as health care, health insurance, education, and entertainment. For example, a study of 6,893 households in Australia reported that households that spent money on tobacco (predominantly cigarettes) were less likely to report expenditure on health insurance (Siahpush, Borland, & Scollo, 2004). A different study of 1,160 households in a low-income region of rural Sri Lanka found that higher expenditure on tobacco (both cigarettes and smokeless tobacco products) was associated with lower expenditure on education (Perera, Guruge, & Jayawardana, 2017). Similarly, a study of 53,625 adults in 40 low- and middle-income countries showed that daily smoking of tobacco products was associated with lower household expenditures on education and health care (Do & Bautista, 2015). Finally, a study of 120,309 households in India revealed that households that spent money on tobacco had spent less on milk, education, clean fuels, and entertainment (John, 2008).

While spending money on cigarettes has been associated with expenditure on many products and services, there is no research on how it relates to charitable giving. According to the World Giving Index, the United States was the second most charitable country in the world in the period between 2011 and 2015 (Charities Aid Foundation, 2016). Charitable giving in this country rose to a new high of US$390 billion in 2016 (Lilly Family School of Philanthropy, 2017). Numerous studies have examined determinants of participation in and the amount of charitable giving. These studies have shown that higher levels of education (Glanville, Paxton, & Wang, 2016; Taniguchi & Marshall, 2014; Wiepking & Maas, 2009), home ownership (Cowley, McKenzie, Pharoah, & Smith, 2011), being married (Mesch, Rooney, Steinberg, & Denton, 2006; Toppe, 2002), and a higher proportion of female adults in a household (Cowley et al., 2011) are associated with a higher probability of participation in and a higher amount of charitable giving. The associations of household expenditure on tobacco with participation in and the amount of charitable giving have never been studied. Several facts lead one to hypothesize that smokers are less likely to participate in charitable giving and give lesser amounts than nonsmokers. First, nonsmokers compared with smokers are more likely to be religious (Martinez, Giglio, Terada, da Silva, & Zucoloto, 2017; Roff et al., 2005), and religious people are more likely to participate in giving (Bekkers & Wiepking, 2011; Brown & Ferris, 2007) and give higher amounts (Bekkers & Wiepking, 2011). Second, smokers report lower level of indicators of social capital such as participation in organizational activities (Islam, Folland, & Kaarbøe, 2017; Siahpush et al., 2006) and trust in others (Hassanzadeh et al., 2016; Islam et al., 2017; Siahpush et al., 2006). There is also evidence that these indicators of social capital contribute to the probability of (Brown & Ferris, 2007) and higher amounts

of charitable giving (Wang & Graddy, 2008). Third, smoking is associated with cognitive decline over time (Anstey, von Sanden, Salim, & O'kearney, 2007; Richards, Jarvis, Thompson, & Wadsworth, 2003), and cognitive ability is shown to predict participation in charitable giving (James, 2011). Fourth, smokers are less happy than others (Shahab & West, 2012; Stickley et al., 2015) and happier people give more to charity (Wang & Graddy, 2008).

By examining the relationship between smoking and charitable giving, we depart from the biomedical tradition of focusing on the health effects of cigarette smoking for the individual smoker. Our goal is to contribute to the body of literature that highlights extra-individual consequences of smoking. This literature emphasizes that smoking has societal and environmental costs. Smoking-related health conditions in the United States cost over US$300 billion each year, which include about US$170 billion for direct medical care for adults and over US$156 billion in lost productivity due to premature deaths (Centers for Disease Control and prevention, 2017; U.S. Department of Health & Human Services, 2014; Xu, Bishop, Kennedy, Simpson, & Pechacek, 2015). Similarly, it has been estimated that due to absenteeism, low productivity, and smoking breaks, private employers incur a cost of US$5,816 for employing a smoker (Berman, Crane, Seiber, & Munur, 2014). Furthermore, smoking negatively affects and damages the environment. Discarded cigarette filters contain toxic chemicals, are non-biodegradable, contaminate waterways and ground soil, and harm wildlife (Register, 2000). Cigarette filters are the single most collected item in international beach cleanups each year (Novotny, Lum, Smith, Wang, & Barnes, 2009). Smoking is deleterious to the environment also because common agricultural practices related to tobacco lead to deforestation and soil degradation, which result in ecological disruptions (Lecours, Almeida, Abdallah, & Novotny, 2012). These studies, as well as ours, highlight the importance of framing smoking as a social issue, rather than an issue relevant only to personal health and personal choice.

The objective of this article was to fill a gap in the literature about cigarette expenditure and charitable giving. We were interested in addressing two specific aims. First, we used data from the Consumer Expenditure Survey (CES) in the United States to assess, among households, the association between (a) spending money on cigarettes and participation in charitable giving, and (b) spending money on cigarettes and amount spent on charitable giving. Second, we used data from the Midlife in the United States (MIDUS) Survey to assess whether the association between smoking and charitable giving is mediated by religiosity, social capital, cognitive aptitude, and happiness.

## Method: Aim 1

### *Data*

To address the first aim, we used data from the CES, which is conducted by the U.S. Census Bureau under contract with the Bureau of Labor Statistics (U.S. Department of Labor, 2016b). The CES is a national household survey representing the entire

U.S. civilian noninstitutional population. The CES uses a cluster sampling design where primary sampling units are small clusters of counties grouped together into geographic entities. The sampling frame within the primary sampling units is the Census Bureau's Master Address File, which contains residential addresses identified in the 2010 Census. Approximately 6,900 households at the identified addresses are interviewed each quarter of the year. Each household is interviewed every 3 months over four calendar quarters. After the fourth interview, the household is dropped from the survey and replaced by a new sample. The response rates varied from a high of 74.5% in 2010 to a low of 64.2% in 2015 (U.S. Department of Labor, 2016a). The interviews took about 60 min, were primarily conducted by personal visit, and used a structured questionnaire to collect data on household income, demographics, and a complete range of expenditure items. We appended data from the third quarter data collection (i.e., July, August, and September) of six consecutive years, 2010 to 2015, with a total sample size of 39,806 households. We did not use the first quarter data because the expenditure report of some of the participants pertained to the previous calendar year. Our sensitivity analyses revealed that using data from the second and fourth quarter yields very similar results as we report in this article (Tables A1 and A2 in the appendix). We excluded from the analysis 588 households, that is, 1.5% of the total number of households, for which there was a missing value for one or more study variables except for income. While the amount of missing data was negligible and not likely to have biased the results, we note that the households with missing data were more likely to participate in charitable giving (63.3% vs. 45.8%, $p < .001$), less likely to report cigarette expenditure (5.5% vs. 17.4%, $p < .001$), and more likely to be in the highest income category (71.7% vs. 33.4%, $p < .001$). The study sample size was 39,218. Ethical approval was not needed to address Aim 1 as we used secondary data that are publicly available by the U.S. Bureau of Statistics.

### *Measurement of the Outcomes: Participation in and Amount of Charitable Giving*

The household interviewee was asked, "Since the first of the reference month [three months prior to the interview], have you or any member of your household given any money by cash, check, or given a gift card to:

- Educational institutions?
- Political organizations?
- Religious Organizations, including churches, temples, and mosques?
- Charities or other organizations?"

The interviewees were also asked, "Have you or any members of your household given any stocks, bonds, or mutual funds to persons or organizations outside of your household?" An affirmative answer to any of the above questions indicated participation in charitable giving. Following each affirmative answer, the interviewees were asked to specify the amount given. The sum of these amounts constituted the amount

of charitable giving. We converted nominal expenditure amounts to constant 2015 dollars using all-item consumer price index to account for inflation (Perrins & Nilsen, 2017; U.S. Bureau of Labor Statistics, 2017).

### *Measurement of Smoking Status of Households and Other Covariates*

The household interviewee was asked, "Since the first of the reference month [three months prior to the interview], have you or any members of your household purchased cigarettes?" An affirmative answer indicated a smoking household.

We employed three indicators of socioeconomic status: household poverty status, education, and housing tenure. We defined poverty status as the ratio of household income to poverty threshold for a given family size and composition for each survey year (U.S. Census Bureau, 2016). Regression-based multiple imputation was used by the Census Bureau to replace missing household income data (U.S. Department of Labor, 2006). We categorized education of the head of household into four groups as follows: less than high school, high school graduate, some college or associate degree, and bachelor's or higher degree. We categorized housing tenure into four groups as follows: owning home without a mortgage, owning home with a mortgage, renting, and other.

Other covariates used in the models were as follows: race/ethnicity of head of household, categorized as non-Hispanic White, non-Hispanic Black, Hispanic, and Other; household type categorized as married without children, married with one or more children, single parent with one or more children, single person, and other; number of females aged 16 and above in the household; and survey year.

### *Statistical Analysis*

The unit of analysis to address the first aim of the study was the household. The U.S. Department of Labor provides sampling weights for each CES. These weights were computed based on the probability of selection of a household, household nonresponse, and national household distribution of age, race, and region (U.S. Department of Labor, 2016b). To combine 6 years of surveys, we created a unified weight by multiplying the original weight in a given survey to the ratio of the sample size for that survey and the sum of sample sizes of all six surveys (Korn & Graubard, 1999). We used this unified weight for the computation of all point estimates and in all analyses.

Logistic regression was used to assess the association of household participation in charitable giving and smoking status. Among the subsample of households that participated in charitable giving, linear regression was used to assess the association of the amount of charitable giving and smoking status among households that participated in charitable giving. In regression analyses, we used the natural logarithm transformation for the amount of charitable giving as this variable had a highly positively skewed distribution. Covariates whose $p$ values were greater than .1 in the bivariate models were not included in the multivariable models. We used Stata Version 14.1 for all analyses (StataCorp, 2015).

## Results: Aim 1

### Sample Characteristics and Bivariate Associations

Table 1 provides weighted sample characteristics and bivariate associations between covariates and the outcomes. Overall, 45.8% of households participated in charitable giving. Among charitable households, the average quarterly expenditure on charitable giving in constant 2015 dollars was US$689.3. About 17.4% of households reported expenditure on smoking. About 14.6% of the households lived below the poverty threshold and 38.4% of the heads of households did not report a level of education beyond high school graduation. Approximately 25.8% of the households owned their home without a mortgage, 38.1% owned their home with a mortgage, and 34.3% lived in a rental property. The percentage of non-Hispanic Whites, non-Hispanic Blacks, and Hispanics were 69.1%, 12.5%, and 12.7%, respectively. About 20.9% of households comprised a married couple without children, 27.2% a married couple with one or more children, 5.9% a single parent with one or more children, and 29.5% a single person. About 16.4% of households had zero, 68.5% had one, and 15.2% had two or more female members.

At the bivariate level, participation in charitable giving was lower among smoking than nonsmoking households (35.9% vs. 47.9%). Similarly, among charitable households, the amount of charitable giving was lower among smoking than nonsmoking households (US$546.7 vs. US$711.7). Furthermore, households that had a higher income, were headed by a person with a higher level of education, owned their home, were headed by a non-Hispanic White individual, included a married couple, and included one or more females were more likely to participate in charitable giving and gave a larger amount to charities compared with others. While the year of survey was not associated with participation in charitable giving, there was evidence that generally there has been an increase in the amount of charitable giving from 2010 to 2015.

### Multivariable Associations

Table 2 shows adjusted odds ratios for the association of participation in charitable giving with household smoking status and other covariates. The odds of participation in charitable giving was 25% smaller among smoking households than nonsmoking households ($p < .001$). The adjusted results about other covariates, except race/ethnicity, were similar to the bivariate results reported above. In the case of race/ethnicity, while based on bivariate results, households headed by a non-Hispanic White individual had the highest probability of participation in charitable giving, in the adjusted analyses, households headed by a non-Hispanic Black individual had the highest probability.

Table 2 also shows the results of the regression of the natural logarithm of the amount of charitable giving on household smoking status and other covariates among households that participated in charitable giving. Smoking households spent 33% ($100 - 100 \times e^{-0.40}$) less on charitable giving than nonsmoking households ($p < .001$). The adjusted results about other covariates, except race/ethnicity, were similar to the bivariate results reported above. In the case of race/ethnicity, while based on bivariate results,

**Table 1.** Weighted Sample Characteristics, Bivariate Association of Participation in Charitable Giving and Covariates ($n = 39{,}218$), and Bivariate Association of Amount of Charitable Giving and Covariates Among Charitable Households ($n = 17{,}888$) (Consumer Expenditure Survey).

| Covariates | % in sample | % charitable household ($p$ value for $\chi^{2a}$) | Amount (US$) of charitable giving ($p$ value for $\chi^{2a}$) |
|---|---|---|---|
| Total sample | | 45.80 | 689.27 |
| Smoking status | | ($p < .001$) | ($p < .001$) |
| Smoking household | 17.35 | 35.94 | 546.68 |
| Nonsmoking household | 82.65 | 47.87 | 711.74 |
| Poverty status | | ($p < .001$) | ($p < .001$) |
| <100% | 14.63 | 28.11 | 316.94 |
| ≥100% and <200% | 21.38 | 38.40 | 418.96 |
| ≥200% and <300% | 30.55 | 46.59 | 562.00 |
| ≥300% | 33.44 | 57.56 | 977.51 |
| Education | | ($p < .001$) | ($p < .001$) |
| Less than high school | 13.06 | 33.87 | 408.11 |
| High school graduate | 25.37 | 39.88 | 494.72 |
| Some college or associate degree | 31.09 | 45.29 | 615.68 |
| Bachelor's or higher degree | 30.47 | 56.37 | 936.58 |
| Housing tenure | | ($p < .001$) | ($p < .001$) |
| Own without mortgage | 25.81 | 55.36 | 876.99 |
| Own with mortgage | 38.07 | 51.75 | 710.13 |
| Rent | 34.29 | 33.04 | 428.53 |
| Other | 1.84 | 26.40 | 402.53 |
| Race/ethnicity | | ($p < .001$) | ($p < .001$) |
| Non-Hispanic White | 69.09 | 48.51 | 744.72 |
| Non-Hispanic Black | 12.52 | 43.63 | 581.65 |
| Hispanic | 12.71 | 34.92 | 433.47 |
| Other | 5.68 | 42.00 | 632.82 |
| Household type | | ($p < .001$) | ($p < .001$) |
| Married without children | 20.92 | 57.56 | 920.47 |
| Married with children | 27.21 | 49.32 | 782.66 |
| Single parent | 5.86 | 31.20 | 352.92 |
| Single person | 29.51 | 42.09 | 523.32 |
| Other | 16.49 | 36.92 | 465.69 |
| Number of females aged 16 and above | | ($p < .001$) | ($p < .001$) |
| 0 | 16.38 | 33.91 | 582.36 |
| 1 | 68.47 | 48.86 | 723.16 |
| 2+ | 15.15 | 44.85 | 609.81 |
| Year | | ($p = .144$) | ($p < .001$) |
| 2010 | 16.97 | 45.27 | 652.37 |
| 2011 | 16.00 | 46.39 | 611.04 |

*(continued)*

**Table 1. (continued)**

| Covariates | % in sample | % charitable household ($p$ value for $\chi^{2a}$) | Amount (US$) of charitable giving ($p$ value for $\chi^{2a}$) |
|---|---|---|---|
| 2012 | 16.55 | 47.56 | 734.70 |
| 2013 | 16.70 | 46.17 | 663.28 |
| 2014 | 16.77 | 45.54 | 741.83 |
| 2015 | 17.01 | 43.96 | 730.16 |

[a]The $p$ values for the bivariate association of covariates and each of the three outcomes using 44 replicate weights.

**Table 2.** Multivariable Results[a] for the Association Between the Probability and Amount of Charitable Giving With Smoking Status of Households and Other Covariates (Consumer Expenditure Survey).

| | Odds of charitable giving ($n$ = 39,218) | | Natural logarithm of amount (US$) of charitable giving ($n$ = 17,888) | |
|---|---|---|---|---|
| Covariates | Adjusted OR (95% CI) | $p$ | Adjusted $\hat{\beta}$ (95% CI) | $p$ |
| Smoking status | | <.001 | | <.001 |
| Smoking household | 0.75 [0.70, 0.80] | | −0.40 [−0.46, −0.34] | |
| Nonsmoking household | 1.00 | | 0.00 | |
| Poverty status | | <.001 | | <.001 |
| <100% | 1.00 | | | |
| ≥100% and <200% | 1.38 [1.27, 1.50] | | 0.23 [0.12, 0.34] | |
| ≥200% and <300% | 1.73 [1.57, 1.91] | | 0.43 [0.32, 0.54] | |
| ≥300% | 2.23 [2.00, 2.49] | | 0.69 [0.57, 0.81] | |
| Education | | <.001 | | <.001 |
| Less than high school | 1.00 | | 0.00 | |
| High school graduate | 1.04 [0.96, 1.13] | | 0.05 [−0.03, 0.13] | |
| Some college or associate degree | 1.30 [1.17, 1.45] | | 0.14 [0.05, 0.22] | |
| Bachelor's or higher degree | 1.63 [1.48, 1.80] | | 0.36 [0.28, 0.44] | |
| Housing tenure | | <.001 | | <.001 |
| Own without mortgage | 1.00 | | 0.00 | |
| Own with mortgage | 0.73 [0.68, 0.77] | | −0.31 [−0.37, −0.25] | |
| Rent | 0.49 [0.46, 0.53] | | −0.56 [−0.63, −0.48] | |
| Other | 0.42 [0.34, 0.53] | | −0.56 [−0.76, −0.35] | |
| Race/ethnicity | | <.001 | | <.001 |
| Non-Hispanic White | 1.00 | | 0.00 | |
| Non-Hispanic Black | 1.26 [1.16, 1.37] | | 0.38 [0.28, 0.47] | |
| Hispanic | 0.85 [0.72, 1.00] | | −0.07 [−0.19, 0.05] | |
| Other | 0.82 [0.73, 0.92] | | −0.12 [−0.25, 0.00] | |

*(continued)*

**Table 2. (continued)**

| Covariates | Odds of charitable giving ($n$ = 39,218) | | Natural logarithm of amount (US$) of charitable giving ($n$ = 17,888) | |
|---|---|---|---|---|
| | Adjusted OR (95% CI) | $p$ | Adjusted $\hat{\beta}$ (95% CI) | $p$ |
| Household type | | <.001 | | <.001 |
| Married without children | 1.00 | | 0.00 | |
| Married with children | 0.84 [0.78, 0.90] | | −0.14 [−0.22, −0.05] | |
| Single parent | 0.63 [0.55, 0.70] | | −0.62 [−0.75, −0.49] | |
| Single person | 0.99 [0.91, 1.08] | | −0.44 [−0.51, −0.37] | |
| Other | 0.66 [0.60, 0.71] | | −0.55 [−0.63, −0.46] | |
| Number of females aged 16 and above | | <.001 | | <.001 |
| 0 | 1.00 | | 0.00 | |
| 1 | 1.71 [1.60, 1.83] | | −0.02 [−0.09, 0.06] | |
| 2+ | 1.84 [1.68, 2.02] | | 0.09 [−0.01, 0.20] | |
| Year | | — | | .005 |
| 2010 | — | | 0.00 | |
| 2011 | — | | −0.11 [−0.19, −0.03] | |
| 2012 | — | | 0.00 [−0.08, 0.08] | |
| 2013 | — | | −0.02 [−0.11, 0.08] | |
| 2014 | — | | 0.00 [−0.08, 0.09] | |
| 2015 | — | | 0.04 [−0.05 0.13] | |

OR = odds ratio; CI = confidence interval.
[a]All ORs from logistic analysis and regression coefficients ($\hat{\beta}$) from linear regression analyses are adjusted for the effect of all covariates in the model.

households headed by a non-Hispanic White individual gave the largest amount to charity, in the adjusted analysis, households headed by a non-Hispanic Black individual gave the largest amount.

We conducted separate analyses across the six survey cycles to examine the extent to which the findings reported above can be replicated and are robust. We found that the odds ratios for the association of participation in charitable giving with household smoking status ranged from 0.83 ($p$ = .045) in 2012 to 0.59 ($p$ < .001) in 2015. The linear regression coefficients for the association between the amount of charitable giving and smoking status ranged from −0.35 ($p$ < .001) in 2011 to −0.47 ($p$ < .001) in 2014. Thus, single-year analyses provided similar results and conclusions to the pooled analysis.

## Method: Aim 2

### *Data*

To address our second aim, we used data from the third wave (2013-2014) of the longitudinal study, MIDUS (Barry, 2014; Ryff et al., 2016). The first wave of MIDUS

was conducted in 1995 to 1996 and comprised a sample of 7,018 adults generated through random digit dialing of households. The second wave, with an attrition rate of 25%, was conducted 9 years later. In the third wave of data collection, 79.6% of the individuals who were in the second wave were interviewed. MIDUS has replenished the sample with new participants at each wave of data collection. Data collection included telephone interviews and self-administered questionnaires. Questions regarding charitable giving were included in the self-administered questionnaire with a sample size of 2,718. We excluded from the analysis 13.1% of the individual for which there was a missing value for one or more of the study variables except for income. Individuals with missing data did not differ in participation in charitable giving or smoking status, but they were less likely to have a higher income (13% vs. 17.4% reported annual income greater than US$80,000, $p < .001$) and less likely to state they were not at all religious (6.5% vs. 11.8%, $p = .023$). Ethical approval was not needed to address Aim 2 as we used secondary data that are publicly available by the U.S. Bureau of Statistics.

### *Measurement of the Outcome: Participation in Charitable Giving*

Individuals were asked, "On average, about how many dollars per month do you or your family members living with you contribute to each of the following organizations: religious groups, political organization or causes, or any other organizations." Those who contributed to any of the three types of organizations were considered to have participated in charitable giving and were distinguished from those who contributed to none of the organizations.

### *Measurement of the Smoking Status, Religiosity, Social Capital, Cognitive Aptitude, Happiness, and Other Covariates*

Individuals who gave an affirmative answer to the question "Do you smoke cigarettes regularly now?" were identified as smokers and were distinguished from those who reported that they "never had a cigarette," "never smoked cigarettes regularly," and "did not smoke cigarettes regularly now."

Religiosity was measured with the question, "How religious are you?" with response options ranging from 1 = "very" to 4 = "not at all." Social capital was measured using the statement, "I have not experienced many warm and trusting relationships with others," whose response options ranged from 1 = "strongly agree" to 7 = "strongly disagree." Cognitive aptitude was measured with the statement, "I can understand instructions only after they are explained to me," with response options ranging from 1 = "strongly agree" to 7 = "strongly disagree." Happiness was measured with the question, "During the past 30 days, how much of the time did you feel extremely happy," whose response options ranged from 1 = "all the time" to 5 = "none of the time."

Other covariates were anxiety/depression, life satisfaction, age, sex, race/ethnicity, income, education, and marital status. Anxiety/depression was measured with the question, "In the past 12 months, have you experienced or been treated for any of the

following: anxiety, depression, or some other emotional disorder?" Individuals who experienced anxiety or depression were distinguished from others. Life satisfaction was measured with the question, "At present, how satisfied are you with your life?" with response options ranging from 1 = "very" to 4 = "not at all." Race/ethnicity was categorized as non-Hispanic White, non-Hispanic non-White, and Hispanic. Pretax yearly income of respondents was categorized into US$30,000 and lower, US$30,001 to US$80,000, and US$80,001+. Education was grouped into less than high school, high school graduate, some college or associate degree, and bachelor's or higher degree. Finally, marital status was categorized as married, divorced/separated, widowed, and never married.

### *Statistical Analysis*

The unit of analysis to address the second aim of the study was the individual. To assess the mediating effect of religiosity, social capital, cognitive aptitude, and happiness on the association between smoking and participation in charitable giving, we estimated two logistic regression models. Model 1 included all covariates except the four potential mediators. Model 2 included the four potential mediators as well as all other covariates. Subsequently, we compared the odds ratio of smoking and its associated $p$ value between the two models. We used bootstrapping with 500 replications to estimate standard errors used to compute $p$ values. We used Stata Version 14.1 for all analyses (StataCorp, 2015).

## Results: Aim 2

Table 3 provides sample characteristics. About 71.3% of the sample participated in charitable giving and 8.6% smoked cigarettes. About 45.4% were male and 88.2% were non-Hispanic White. The average age of the sample was 63.9 with a range of 39 to 92 years.

Table 4 provides adjusted logistic results for Models 1 and 2. In Model 1, the odds of participation in charitable giving was 39% smaller among smokers than nonsmokers ($p = .004$). In Model 2, where the potential mediators were added, there was still evidence for an association between smoking status and charitable giving; the odds of giving was 34% smaller in smokers than nonsmokers ($p = .02$). Thus, the association of smoking status and charitable giving was not mediated by religiosity, social capital, cognitive aptitude, and happiness. Higher levels of religiosity ($p < .001$), social capital ($p = .009$), and cognitive aptitude ($p = .005$) were associated with a higher probability of charitable giving. Happiness was not associated with the outcome.

## Discussion

In this study, we found that households that spend money on cigarettes are less likely to participate in charitable giving. We also found that, among households who do give to charity, smoking households give a lesser amount than others do. We also found that

**Table 3.** Sample Characteristics ($n$ = 2,361) (Midlife in the United States Survey).

| Variables | % or *M* (range) |
|---|---|
| Participation in charitable giving | |
| Yes | 71.28 |
| No | 28.72 |
| Smoking status | |
| Smoker | 8.64 |
| Nonsmoker | 91.36 |
| Religiosity | 2.19 (1-4) |
| Social capital | 5.56 (1-7) |
| Cognitive aptitude | 5.53 (1-7) |
| Happiness | 3.06 (1-5) |
| Anxiety/depression | |
| Yes | 20.19 |
| No | 79.81 |
| Life satisfaction | 1.41 (1-4) |
| Age | 63.89 (39-92) |
| Sex | |
| Male | 45.36 |
| Female | 54.64 |
| Race/ethnicity | |
| Non-Hispanic White | 88.23 |
| Non-Hispanic non-White | 8.94 |
| Other | 2.84 |
| Income | |
| US$30,000 and lower | 34.27 |
| US$30,001-US$80,000 | 37.99 |
| US$80,001+ | 17.37 |
| Missing | 10.38 |
| Education | |
| Less than high school | 4.07 |
| High school graduate | 24.18 |
| Some college or associate degree | 28.93 |
| Bachelor's or higher degree | 42.82 |
| Marital status | |
| Married | 67.47 |
| Divorced/separated | 14.44 |
| Widowed | 11.10 |
| Never married | 6.99 |

the association of charitable giving does not appear to be mediated by religiosity, social capital, cognitive aptitude, and happiness. To our knowledge, this was the first study on the topic of tobacco expenditure and charitable giving.

**Table 4.** Adjusted[a] ORs for the Association of Charitable Giving and Covariates ($n$ = 2,361) (Midlife in the United States Survey).

| | Model 1 | | Model 2 | |
|---|---|---|---|---|
| Covariates | Adjusted OR (95% CI) | *p* | Adjusted OR (95% CI) | *p* |
| Smoking status | | .004 | | .020 |
| Smoker | 0.61 [0.44, 0.84] | | 0.66 [0.47, 0.92] | |
| Nonsmoker | 1.00 | | 1.00 | |
| Anxiety/depression | | .267 | | .582 |
| Yes | 0.87 [0.69, 1.11] | | 0.93 [0.72, 1.20] | |
| No | 1.00 | | 1.00 | |
| Life satisfaction | 0.76 [0.65, 0.89] | .002 | 0.79 [0.67, 0.94] | .013 |
| Age | 1.03 [1.02, 1.04] | <.001 | 1.03 [1.01, 1.04] | <.001 |
| Sex | | <.001 | | |
| Male | 0.56 [0.45, 0.69] | | 0.64 [0.51, 0.80] | <.001 |
| Female | 1.00 | | 1.00 | |
| Race/ethnicity | | .776 | | .474 |
| Non-Hispanic White | 1.00 | | 1.00 | |
| Non-Hispanic non-White | 0.88 [0.64, 1.23] | | 0.80 [0.57, 1.13] | |
| Other | 0.93 [0.53, 1.64] | | 0.88 [0.49, 1.57] | |
| Income | | <.001 | | <.001 |
| US$30,000 and lower | 1.00 | | | |
| US$30,001-US$80,000 | 1.40 [1.10, 1.77] | | 1.42 [1.11, 1.81] | |
| US$80,001+ | 2.47 [1.73, 3.54] | | 2.68 [1.85, 3.88] | |
| Missing | 0.80 [0.58, 1.10] | | 0.77 [0.55, 1.07] | |
| Education | | <.001 | | <.001 |
| Less than high school | 1.00 | | 1.00 | |
| High school graduate | 1.63 [1.03, 2.57] | | 1.53 [0.96, 2.43] | |
| Some college or associate degree | 2.66 [1.68, 4.22] | | 2.59 [1.61, 4.15] | |
| Bachelor's or higher degree | 4.90 [3.07, 7.82] | | 5.00 [3.08, 8.13] | |
| Marital status | | <.001 | | <.001 |
| Married | 1.00 | | | |
| Divorced/separated | 0.46 [0.35, 0.60] | | 0.51 [0.39, 0.67] | |
| Widowed | 0.71 [0.51, 1.00] | | 0.69 [0.49, 0.98] | |
| Never married | 1.01 [0.69, 1.50] | | 1.18 [0.79, 1.76] | |
| Religiosity | — | | 0.58 [0.52, 0.64] | <.001 |
| Social capital | — | | 1.07 [1.02, 1.13] | .009 |
| Cognitive aptitude | — | | 1.09 [1.02, 1.15] | .005 |
| Happiness | — | | 1.08 [0.96, 1.21] | .188 |

ORs = odds ratios; CI = confidence interval.

[a]All ORs from logistic analysis are adjusted for the effect of all covariates in the model.

Consistent with previous literature, our results indicated that households that have a higher socioeconomic status, include a married couple, or have a higher proportion of women are more likely to participate in charitable giving and give a higher amount than others (Cowley et al., 2011; Glanville et al., 2016; Mesch et al., 2006; Taniguchi & Marshall, 2014; Toppe, 2002; Wiepking & Maas, 2009). While we found that Blacks give more than any other racial/ethnic groups, a study in the United States found that Blacks are less likely than Whites to give to secular causes and equally likely to give to religious causes (Wang & Graddy, 2008). A different study in the United States found no racial/ethnic differences either in participation in or in amount of giving (Mesch et al., 2006). While the association of race/ethnicity and charitable giving warrants further investigation, we note that our finding is consistent with the facts that African Americans are more religious than others (Taylor, Chatters, & Brown, 2014) and that religiosity and charitable giving are positively correlated (Bekkers & Wiepking, 2011; Brown & Ferris, 2007; Taniguchi & Marshall, 2014; Wang & Graddy, 2008).

It may be argued that the reason expenditure on cigarettes is associated with lesser charitable giving may stem from smokers having less discretionary money than others because (a) they spend money on cigarettes and (b) their health care costs are higher than others. To empirically address this argument, we subtracted cigarette and health expenditure (health insurance, medical services, prescription drugs, and medical supplies) from household income and controlled for this modified income variable in the analyses described above. The association of tobacco expenditure with the probability and amount of charitable giving and the associated *p* values were very similar to the associations reported in Table 2, which indicates that having less discretionary money to spend does not explain the relationship between expenditure on cigarettes and charity.

A major strength of our analysis of the association between charitable giving and smoking (Aim 1) was its use of six consecutive years of national and comprehensive expenditure data with relatively high response rates and large sample sizes. The validity of the CES data has been investigated by comparing them with National Income and Product Accounts data (Bee, Meyer, & Sullivan, 2012). While cigarette expenditure was not included in this comparison, the findings showed that most of the large categories of consumption were measured well in the CES, as the ratio to the National Income and Accounts statistics was close to 1 and has not declined notably over time (Bee et al., 2012). The major weakness of the study is that, as it is the case with all cross-sectional analyses, it does not allow inferences about causality. While we have shown that there is a strong relationship between smoking and charitable giving, our study does not identify the direction of this relationship. A longitudinal data set containing information on both smoking and charitable giving would be required to shed light on the causal direction of the association between these variables. Another weakness of this work is that, as reported in a study where households in the CES were linked to zip-code level average income, the very high-income households are less likely to respond to the survey (Sabelhaus et al., 2012). However, nonresponse rates are not associated with income over most of the income distribution (Sabelhaus et al., 2012). An additional weakness of the study pertains to the measurement of charitable

giving in CES. The survey asked respondents whether they have "given any money by cash, check, or given a gift card to . . ."; there is no mention of giving by credit card. This likely underestimated the prevalence and amount of charitable giving, although some individuals might have considered giving by credit card the same as giving by cash. The possible underestimation bias may not have been consequential in the current study because our aim was not to provide an estimate of the prevalence or amount of giving, but to assess the association between smoking and giving. We note that the survey question about charitable giving in MIDUS asked respondents to report all such instances regardless of whether they were by cash, credit card, or any other method. The fact that both CES and MIDUS provided strong evidence of an association between smoking and charitable giving to some extent addresses the concern about the measurement of the latter variable in CES. Finally, the fact that the heads of households were asked to report on the expenditure of the whole household might have caused error in the measurement of tobacco and charitable expenditures. This is because the heads of households may not have complete information on expenditures by each household member.

A weakness of our analysis of the mediators of the relationship between smoking and charitable giving (Aim 2) was that MIDUS did not provide a representative sample of the U.S. population; respondents' average age in MIDUS was about 64 years. We are not aware of a data set that is both representative of the U.S. population and has information on the four variables whose mediating role we examined. Another weakness of our analysis of the mediators pertains to the measurement of these variables. Due to data limitations, we used only one questionnaire item for each mediator. Many of the previous studies have used several items to construct one or more scale to measure these mediators. For example, Ji, Pendergraft, and Perry (2006), in their study of altruism and religiosity, indicated that religiosity has two dimensions (intrinsic and extrinsic) and used multiple questionnaire items to construct a scale for each dimension. Similarly, Wang and Graddy (2008), in their study of philanthropic giving and social capital, operationalized social capital as having three dimensions (social networks, social trust, and volunteering) and developed a multi-item scale for each dimension. It may be the case that the reason we did not find evidence of mediation was that we were unable to provide highly valid or reliable measurement of the mediators. We invite future researchers to re-examine our mediational analysis with better measurement of religiosity, social capital, cognitive aptitude, and happiness. Furthermore, future studies can examine other variables such as individual personality traits or social stigma associated with smoking (which may bring about marginalization from mainstream social norms of giving and altruism) that could explain the relationship between cigarette spending and charitable giving.

Many governments acknowledge the importance of civil society (i.e., the nongovernment and not-for-profit groups and organizations) in addressing social and public health challenges of their nations, and the level of charitable giving is an important indicator of the strength of civil society (Wang & Graddy, 2008). The results of the current study suggest that as the prevalence of smoking declines in the United States, we may witness an associated increase in charitable giving and, in turn, a stronger civil society.

# Appendix

**Table A1.** Multivariable Results[a] for the Association Between the Probability and Amount of Charitable Giving With Smoking Status of Households and Other Covariates (Second Quarter of Data Collection).

| | Odds of charitable giving ($n$ = 39,218) | | Natural logarithm of amount (US$) of charitable giving ($n$ = 17,888) | |
|---|---|---|---|---|
| Covariates | Adjusted OR (95% CI) | $p$ | Adjusted $\hat{\beta}$ (95% CI) | $p$ |
| Smoking status | | <.001 | | <.001 |
| Smoking households | 0.78 [0.73, 0.82] | | −0.43 [−0.52, −0.34] | |
| Nonsmoking household | 1.00 | | 0.00 | |
| Poverty status | | <.001 | | <.001 |
| <100% | 1.00 | | 0.00 | |
| ≥100% and <200% | 1.40 [1.29, 1.51] | | 0.20 [0.11, 0.29] | |
| ≥200% and <300% | 1.70 [1.56, 1.85] | | 0.38 [0.28, 0.48] | |
| ≥300% | 2.19 [1.97, 2.42] | | 0.65 [0.54, 0.76] | |
| Education | | <.001 | | <.001 |
| Less than high school | 1.00 | | 0.00 | |
| High school graduate | 1.11 [1.02, 1.21] | | 0.03 [−0.03, 0.09] | |
| Some college or associate degree | 1.37 [1.24, 1.51] | | 0.10 [−0.00, 0.20] | |
| Bachelor's or higher degree | 1.71 [1.53, 1.90] | | 0.32 [0.24, 0.41] | |
| Housing tenure | | <.001 | | <.001 |
| Own without mortgage | 1.00 | | 0.00 | |
| Own with mortgage | 0.75 [0.70, 0.79] | | −0.33 [−0.39, −0.28] | |
| Rent | 0.50 [0.47, 0.53] | | −0.55 [−0.62, −0.48] | |
| Other | 0.53 [0.43, 0.66] | | −0.53 [−0.76, −0.31] | |
| Race/ethnicity | | <.001 | | <.001 |
| Non-Hispanic White | 1.00 | | 0.00 | |
| Non-Hispanic Black | 1.28 [1.17, 1.40] | | 0.38 [0.29, 0.46] | |
| Hispanic | 0.90 [0.79, 1.01] | | −0.16 [−0.26, −0.06] | |
| Other | 0.85 [0.77, 0.93] | | −0.17 [−0.29, −0.06] | |
| Household type | | <.001 | | <.001 |
| Married without children | 1.00 | | 0.00 | |
| Married with children | 0.83 [0.78, 0.90] | | −0.06 [−0.12, 0.01] | |
| Single parent | 0.60 [0.53, 0.68] | | −0.43 [−0.54, −0.31] | |
| Single person | 0.95 [0.87, 1.03] | | −0.45 [−0.53, −0.38] | |
| Other | 0.61 [0.56, 0.66] | | −0.49 [−0.57, −0.40] | |
| Number of females aged 16 and above | | <.001 | | <.024 |
| 0 | 1.00 | | 0.00 | |
| 1 | 1.70 [1.56, 1.86] | | −0.01 [−0.10, 0.09] | |
| 2+ | 1.84 [1.64, 2.06] | | 0.07 [−0.04, 0.19] | |

*(continued)*

**Table A1. (continued)**

| Covariates | Odds of charitable giving ($n$ = 39,218) Adjusted OR (95% CI) | $p$ | Natural logarithm of amount (US$) of charitable giving ($n$ = 17,888) Adjusted $\hat{\beta}$ (95% CI) | $p$ |
|---|---|---|---|---|
| Year | | — | | .593 |
| 2010 | — | | 0.00 | |
| 2011 | — | | −0.04 [−0.12, 0.05] | |
| 2012 | — | | −0.02 [−0.11, 0.06] | |
| 2013 | — | | 0.04 [−0.05, 0.13] | |
| 2014 | — | | 0.02 [−0.06, 0.11] | |
| 2015 | — | | −0.01 [−0.12, 0.10] | |

OR = odds ratio; CI = confidence interval.
[a]All ORs from logistic analysis and regression coefficients ($\hat{\beta}$) from linear regression analyses are adjusted for the effect of all covariates in the model.

**Table A2.** Multivariable Results[a] for the Association Between the Probability and Amount of Charitable Giving With Smoking Status of Households and Other Covariates (Fourth Quarter of Data Collection).

| Covariates | Odds of charitable giving ($n$ = 39,218) Adjusted OR (95% CI) | $p$ | Natural logarithm of amount (US$) of charitable giving ($n$ = 17,888) Adjusted $\hat{\beta}$ (95% CI) | $p$ |
|---|---|---|---|---|
| Smoking status | | <.001 | | <.001 |
| Smoking household | 0.85 [0.80, 0.89] | | −0.38 [−0.45, −0.32] | |
| Nonsmoking household | 1.00 | | 0.00 | |
| Poverty status | | <.001 | | <.001 |
| <100% | 1.00 | | 0.00 | |
| ≥100% and <200% | 1.32 [1.19, 1.46] | | 0.33 [0.23, 0.42] | |
| ≥200% and <300% | 1.63 [1.46, 1.82] | | 0.49 [0.39, 0.58] | |
| ≥300% | 2.06 [1.81, 2.34] | | 0.74 [0.62, 0.85] | |
| Education | | <.001 | | <.001 |
| Less than high school | 1.00 | | 0.00 | |
| High school graduate | 1.09 [1.00, 1.18] | | 0.02 [−0.08, 0.12] | |
| Some college or associate degree | 1.37 [1.26, 1.50] | | 0.10 [−0.01, 0.21] | |
| Bachelor's or higher degree | 1.84 [1.69, 2.00] | | 0.31 [0.22, 0.41] | |
| Housing tenure | | <.001 | | <.001 |
| Own without mortgage | 1.00 | | 0.00 | |
| Own with mortgage | 0.77 [0.73, 0.81] | | −0.36 [−0.43, −0.29] | |
| Rent | 0.51 [0.48, 0.55] | | −0.65 [−0.75, −0.55] | |

*(continued)*

**Table A2. (continued)**

| Covariates | Odds of charitable giving ($n$ = 39,218) | | Natural logarithm of amount (US$) of charitable giving ($n$ = 17,888) | |
|---|---|---|---|---|
| | Adjusted OR (95% CI) | $p$ | Adjusted $\hat{\beta}$ (95% CI) | $p$ |
| Other | 0.43 [0.35, 0.53] | | −0.63 [−0.86, −0.39] | |
| Race/ethnicity | | <.001 | | <.001 |
| Non-Hispanic White | 1.00 | | 0.00 | |
| Non-Hispanic Black | 1.17 [1.06, 1.30] | | 0.37 [0.27, 0.47] | |
| Hispanic | 0.84 [0.73, 0.96] | | −0.12 [−0.23, 0.00] | |
| Other | 0.84 [0.75, 0.94] | | −0.16 [−0.27, −0.06] | |
| Household type | | <.001 | | <.001 |
| Married without children | 1.00 | | 0.00 | |
| Married with children | 0.81 [0.75, 0.87] | | −0.10 [−0.18, −0.03] | |
| Single parent | 0.56 [0.49, 0.63] | | −0.56 [−0.71, −0.42] | |
| Single person | 0.98 [0.90, 1.08] | | −0.49 [−0.55, −0.43] | |
| Other | 0.63 [0.58, 0.68] | | −0.58 [−0.68, −0.49] | |
| Number of females aged 16 and above | | <.001 | | <.004 |
| 0 | 1.00 | | 0.00 | |
| 1 | 1.78 [1.62, 1.95] | | −0.07 [−0.15, 0.02] | |
| 2+ | 1.94 [1.71, 2.20] | | 0.04 [−0.06, 0.15] | |
| Year | | — | | <.001 |
| 2010 | — | | 0.00 | |
| 2011 | — | | −0.09 [−0.17, −0.00] | |
| 2012 | — | | 0.01 [−0.05, 0.08] | |
| 2013 | — | | 0.02 [−0.07, 0.10] | |
| 2014 | — | | 0.29 [0.19, 0.40] | |
| 2015 | — | | 0.02 [−0.08, 0.11] | |

OR = odds ratio; CI = confidence interval.
[a]All ORs from logistic analysis and regression coefficients ($\hat{\beta}$) from linear regression analyses are adjusted for the effect of all covariates in the model.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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## References


Anstey, K. J., von Sanden, C., Salim, A., & O'Kearney, R. (2007). Smoking as a risk factor for dementia and cognitive decline: A meta-analysis of prospective studies. *American Journal of Epidemiology*, *166*, 367-378.

Barry, T. R. (2014). The Midlife in the United States (MIDUS) series: A national longitudinal study of health and well-being. *Open Health Data*, *2*(1), e3.

Bee, A., Meyer, B. D., & Sullivan, J. X. (2012). *The validity of consumption data: Are the consumer expenditure interview and diary surveys informative?* Retrieved from https://www.nber.org/papers/w18308

Bekkers, R., & Wiepking, P. (2011). Who gives? A literature review of predictors of charitable giving part one: Religion, education, age and socialisation. *Voluntary Sector Review*, *2*, 337-365.

Berman, M., Crane, R., Seiber, E., & Munur, M. (2014). Estimating the cost of a smoking employee. *Tobacco Control*, *23*, 428-433. doi:10.1136/tobaccocontrol-2012-050888

Brown, E., & Ferris, J. M. (2007). Social capital and philanthropy: An analysis of the impact of social capital on individual giving and volunteering. *Nonprofit and Voluntary Sector Quarterly*, *36*, 85-99.

Centers for Disease Control and prevention. (2017). *Economic trends in tobacco*. Retrieved from https://www.cdc.gov/tobacco/data_statistics/fact_sheets/economics/econ_facts/index.htm

Charities Aid Foundation. (2016). *CAF World Giving Index 2016*. Retrieved from https://www.cafonline.org/about-us/publications/2016-publications/caf-world-giving-index-2016

Cowley, E., McKenzie, T., Pharoah, C., & Smith, S. (2011). *The new state of donation: Three decades of household giving to charity 1978-2008*. Retrieved from http://www.bristol.ac.uk/cmpo/

Do, Y. K., & Bautista, M. A. (2015). Tobacco use and household expenditures on food, education, and healthcare in low- and middle-income countries: A multilevel analysis. *BMC Public Health*, *15*(1), Article 1098.

Glanville, J. L., Paxton, P., & Wang, Y. (2016). Social capital and generosity: A multilevel analysis. *Nonprofit and Voluntary Sector Quarterly*, *45*, 526-547.

Hassanzadeh, J., Torabinia, M., Asadi-Lari, M., Ghaem, H., Menati, R., Niazi, M., & Kassani, A. (2016). The associated factors with social capital using path analysis: A population-based survey in Tehran, Iran. *Medical Journal of the Islamic Republic of Iran*, *30*, 818-826.

Islam, M. K., Folland, S., & Kaarbøe, O. M. (2017). Social capital and cigarette smoking: New empirics featuring the Norwegian HUNT data. *Economics & Human Biology*, *26*, 174-185.

James, R. N. (2011). Charitable giving and cognitive ability. *International Journal of Nonprofit and Voluntary Sector Marketing*, *16*, 70-83.

Ji, C.-H. C., Pendergraft, L., & Perry, M. (2006). Religiosity, altruism, and altruistic hypocrisy: Evidence from Protestant adolescents. *Review of Religious Research*, *48*, 156-178.

John, R. M. (2008). Crowding out effect of tobacco expenditure and its implications on household resource allocation in India. *Social Science & Medicine*, *66*, 1356-1367.

Korn, E. L., & Graubard, B, I. (1999). *Analysis of health surveys*. New York, NY: John Wiley.

Lecours, N., Almeida, G. E. G., Abdallah, J. M., & Novotny, T. E. (2012). Environmental health impacts of tobacco farming: A review of the literature. *Tobacco Control*, *21*, 191-196.

Lilly Family School of Philanthropy. (2017). *Giving USA 2017: The annual report on philanthropy for the year 2016*. Chicago, IL: Giving USA.

Martinez, E. Z., Giglio, F. M., Terada, N. A. Y., da Silva, A. S., & Zucoloto, M. L. (2017). Smoking prevalence among users of primary healthcare units in Brazil: The role of religiosity. *Journal of Religion and Health*, *56*, 2180-2193.

Mesch, D. J., Rooney, P. M., Steinberg, K. S., & Denton, B. (2006). The effects of race, gender, and marital status on giving and volunteering in Indiana. *Nonprofit and Voluntary Sector Quarterly*, *35*, 565-587.

Novotny, T. E., Lum, K., Smith, E., Wang, V., & Barnes, R. (2009). Cigarettes butts and the case for an environmental policy on hazardous cigarette waste. *International Journal of Environmental Research and Public Health*, *6*, 1691-1705.

Perera, K. M. N., Guruge, G. N. D, & Jayawardana, P. L. (2017). Household expenditure on tobacco consumption in a poverty-stricken rural district in Sri Lanka. *Asia Pacific Journal of Public Health*, *29*, 140-148.

Perrins, G., & Nilsen, D. (2017). *Math calculations to better utilize CPI data*. Washington, DC: U.S. Bureau of Labor Statistics.

Register, K. (2000). Cigarette butts as litter—Toxic as well as ugly? *Underwater Naturalist*, *25*(2), 23-29.

Richards, M., Jarvis, M. J., Thompson, N., & Wadsworth, M. E. J. (2003). Cigarette smoking and cognitive decline in midlife: Evidence from a prospective birth cohort study. *American Journal of Public Health*, *93*, 994-998.

Roff, L. L., Klemmack, D. L., Parker, M., Koenig, H. G., Sawyer-Baker, P., & Allman, R. M. (2005). Religiosity, smoking, exercise, and obesity among southern, community-dwelling older adults. *Journal of Applied Gerontology*, *24*, 337-354.

Ryff, C., Almeida, D., Ayanian, J., Binkley, N., Carr, D., Coe, C., & Williams, D. (2016). *National survey of midlife development in the United States (MIDUS 3), 2013–2014 (ICPSR 36346-v4)*. Ann Arbor, MI: Inter-University Consortium for Political and Social Research [Distributor]. doi:10.3886/ICPSR36346.v4

Sabelhaus, J., Johnson, D., Ash, S., Swanson, D., Garner, T., Greenlees, J., & Henderson, S. (2012). *Is the Consumer Expenditure Survey representative by income?* Retrieved from https://www.nber.org/chapters/c12673

Shahab, L., & West, R. (2012). Differences in happiness between smokers, ex-smokers and never smokers: Cross-sectional findings from a national household survey. *Drug and Alcohol Dependence*, *121*, 38-44.

Siahpush, M., Borland, R., & Scollo, M. (2004). Is household smoking status associated with expenditure on food at restaurants, alcohol, gambling and insurance? Results from the 1998-99 Household Expenditure Survey, Australia. *Tobacco Control*, *13*, 409-414.

Siahpush, M., Borland, R., Taylor, J., Singh, G. K., Ansari, Z., & Serraglio, A. (2006). The association of smoking with perception of income inequality, relative material well-being, and social capital. *Social Science & Medicine*, *63*, 2801-2812.

StataCorp. (2015). Stata statistical Software: Release 14.1 (MP Parallel Edition). College Station, TX: Author.

Stickley, A., Koyanagi, A., Roberts, B., Leinsalu, M., Goryakin, Y., & McKee, M. (2015). Smoking status, nicotine dependence and happiness in nine countries of the former Soviet Union. *Tobacco Control*, *24*, 190-197.

Taniguchi, H., & Marshall, G. A. (2014). The effects of social trust and institutional trust on formal volunteering and charitable giving in Japan. *Voluntas: International Journal of Voluntary and Nonprofit Organizations*, *25*, 150-175.

Taylor, R. J., Chatters, L. M., & Brown, R. K. (2014). African American religious participation. *Review of Religious Research*, *56*, 513-538.

Toppe, C. M. (2002). *Giving & volunteering in the United States, 2001: Findings from a national survey*. Washington, DC: Independent Sector.

U.S. Bureau of Labor Statistics. (2017). *Consumer price index historical tables for U.S. city average*. Retrieved from https://www.bls.gov/regions/mid-atlantic/data/consumerpriceindexhistorical_us_table.htm

U.S. Census Bureau. (2016). *Poverty thresholds*. Retrieved from https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html

U.S. Department of Health & Human Services. (2014). *The health consequences of smoking—50 years of progress: A report of the Surgeon General*. Atlanta, GA: Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, U.S. Department of Health and Human Services.

U.S. Department of Labor. (2006). *User's guide to income imputation in the CE*. Washington, DC: U.S. Bureau of Labor Statistics.

U.S. Department of Labor. (2016a). *2015 response rates: Interview and diary survey consumer expenditure public use microdata*. Washington, DC: U.S. Bureau of Labor Statistics.

U.S. Department of Labor. (2016b). *2015 users' document: Interview survey public-use microdata (PUMD) consumer expenditure*. Washington, DC: U.S. Bureau of Labor Statistics.

Wang, L., & Graddy, E. (2008). Social capital, volunteering, and charitable giving. *Voluntas: International Journal of Voluntary and Nonprofit Organizations*, *19*(1), Article 23.

Wiepking, P., & Maas, I. (2009). Resources that make you generous: Effects of social and human resources on charitable giving. *Social Forces*, *87*, 1973-1995.

Xu, X., Bishop, E. E., Kennedy, S. M., Simpson, S. A., & Pechacek, T. F. (2015). Annual healthcare spending attributable to cigarette smoking: An update. *American Journal of Preventive Medicine*, *48*, 326-333.

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