


# A purposeful lifestyle is a healthful lifestyle: Linking sense of purpose to self-rated health through multiple health behaviors

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## Abstract

Having a purpose in life has been consistently linked to subjective and objective health markers. Using data from the Hawaii Study of Personality and Health ( $n = 749$ ,  $M_{age} = 60.1$  years), we tested multiple health behaviors as unique mediators of the correlation between sense of purpose and self-rated health ( $r = .29$ ). Correlational analyses found that participants' sense of purpose was positively associated with their reports of vigorous and moderate activity, vegetable intake, flossing, and sleep quality. Combined in a multiple-mediator model, bootstrapping analyses suggested that sleep quality and vigorous activity proved significant unique mediators.

## Keywords

health behavior, multiple mediation, physical activity, purpose in life, self-reported health

Psychosocial dispositions consistently predict prominent health and well-being outcomes across the life span (see Hampson, 2012; Hill and Roberts, 2016; Smith, 2006 for reviews). For instance, individuals who report a greater sense of purpose in life tend to experience reduced risk for functional disability (Boyle et al., 2010), better cardiovascular health (Kim et al., 2013), and lower risk of mortality (Boyle et al., 2009; Hill and Turiano, 2014). Consistent with these results, sense of purpose has been positively correlated with self-reported health (e.g. Hill et al., 2015; Scheier et al., 2006). Theoretical frameworks have been developed that propose mechanisms linking individual dispositions to health, often focusing on health behaviors as explanatory pathways (Adler and Matthews, 1994; Smith, 2006). This has supported a growing literature

on mechanisms linking broader dispositional characteristics, such as the Big Five personality traits, to health outcomes. Research testing mechanisms relating sense of purpose to health outcomes remain rare. Moreover, the existing literature on mechanisms linking purpose to health typically considers a single health behavior of interest, such as use of medical services (Kim et al., 2014) or activity engagement (Hooker and Masters, 2016). While valuable for the initial

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nomination of behavioral pathways, this research is limited with respect to considering the relative value of different mechanisms linking purpose to health and is unlikely to provide a comprehensive account of the mechanisms involved. This study tested a multiple-mediator model linking sense of purpose to self-reported health through different multiple behaviors, to provide greater insight into which pathways may provide unique explanatory value for the health benefits associated with sense of purpose.

### **A purposeful life is a healthy life**

Having a purpose involves identifying and committing to a broad life direction that organizes one's short- and long-term goals and in turn helps guide daily behaviors (McKnight and Kashdan, 2009). Purposeful living has been defined with respect to being more engaged with daily activities and selecting activities that match one's long-term aims (Scheier et al., 2006). Given the clear benefits of activity engagement for physical health, this pathway appears a likely explanation for why purposeful individuals experience greater health benefits. In support, individuals with a stronger sense of purpose report greater agency (Bronk et al., 2009; Burrow et al., 2010) and energy (Scheier et al., 2006), and higher pedometer counts, a more objective marker of activity (Hooker and Masters, 2016). However, research is limited with respect to assessing different levels of activity intensity, as well as formally testing activity engagement as a mediator of the purpose–health association.

Additionally, it has been suggested that purposeful individuals should be at a reduced risk for disordered eating behavior (McKnight and Kashdan, 2009). These researchers suggested that purposeful individuals should have greater self-control and ability to optimally allocate their resources. In tandem with the greater ability to organize daily activities toward long-term aims, one can see a rationale for linking purpose to healthier eating habits, although limited empirical work has tested this claim. Conscientiousness is positively associated with sense of purpose

(Hill and Burrow, 2012; Hill et al., 2015; Schmutte and Ryff, 1997) and is consistently associated with healthy behaviors, such as physical activity and healthy eating (Bogg and Roberts, 2004). For these reasons, one would expect a link between sense of purpose and healthier eating habits, which ultimately may lead to better health. However, it remains important to demonstrate that purpose holds a unique effect on this health behavior, as this may be partly accounted for by its association with conscientiousness.

Similarly, dental health behavior (i.e. flossing) appears linked to broader personality traits that compose the Big Five (John and Srivastava, 1999), including neuroticism and extraversion (Kressin et al., 1999; Thomson et al., 2011), two traits that also are strong correlates of sense of purpose (Hill and Burrow, 2012; Hill et al., 2015). Flossing behavior is an important behavioral pathway to consider in this study for at least two reasons. First, oral hygiene is a significant predictor of mortality risk and risk for major health ailments (DeStefano et al., 1993; Jansson et al., 2001). Second, flossing could serve as a good proxy for healthy living more broadly; if one is likely to set aside time for flossing, that individual also may be more prone toward other healthy lifestyle activities. Given the importance of oral hygiene for health, and that flossing may provide a proxy for healthy living more broadly, we sought to provide an initial examination of whether purpose is linked to flossing activity and in turn whether this provides another explanation for the purpose–health association.

Finally, research has consistently demonstrated that sleep is an essential component of healthy living, by virtue of its consistent associations with physiological health indices (e.g. Siegel, 2005). Sense of purpose has been linked to a reduced likelihood of future sleep disturbances, above and beyond psychological concerns, such as depressive symptoms and anxiety (Kim et al., 2015). Purposeful individuals might experience better sleep in part because their heightened ability to organize their daily lives helps them to avoid ruminating or worrying

about missed opportunities. Moreover, their greater propensity for activity may play a role in promoting healthier sleep habits. However, it is worth noting that associations between purpose and sleep have been observed even when controlling for health behaviors such as exercise (Kim et al., 2015), suggesting that the association between purpose and sleep is potentially unique from the behavioral pathways discussed above. Research, though, is still limited with respect to whether sleep quality helps to explain the purpose–health association, as well as whether it does so independent of the Big Five, which also predicts sleep habits (e.g. Gray and Watson, 2002).

## Current study

Given the accruing evidence that having a sense of purpose is associated with health benefits both concurrently (Scheier et al., 2006) and in the long term (Boyle et al., 2009; Hill and Turiano, 2014), further research is needed to understand the mechanisms linking purpose to better health. This study will examine multiple potential pathways linking purpose to self-reported physical health, using data from the initial assessment of purpose from the long-running Hawaii Longitudinal Study of Personality and Health (Hampson et al., 2001, 2013). Middle adult participants completed measures of sense of purpose, health behaviors, and self-reported health, which were combined with their self-reports on the Big Five personality traits (John and Srivastava, 1999) from the previous survey measurement, around 2 years prior. First, we sought to replicate previous work demonstrating a relationship between purpose and self-rated health. Although this outcome is potentially suspect to self-report biases, it consistently predicts objective markers of health status, such as mortality risk (Idler and Benyamini, 1997), particularly for mortality due to potentially preventable causes (Benjamins et al., 2004). Second, we examined whether different health behaviors proved significant explanations of the purpose–health association when examined in single mediation models: rigorous activity, moderate

activity, vegetable intake (a proxy for healthy eating), flossing behavior, and sleep quality. Third, we extended this work by testing whether health behaviors provided unique explanatory value in a test involving multiple mediators simultaneously. Across all three objectives, we examined whether sense of purpose is associated with health and health behavior above and beyond the known influence of the Big Five on these outcomes (e.g. Bogg and Roberts, 2004; Hampson, 2012). In so doing, we sought to provide further evidence that sense of purpose is not reducible to these other personality dimensions, which would build from existing studies supporting this contention (Hill et al., 2016a, 2016b).

## Method

### Participants and procedure

A total of 749 adults (53% female;  $M_{age} = 60.1$  years, range: 56–65 years) participated in the survey and received US\$25 compensation. All participants were members of the ongoing Hawaii Study of Personality and Health (Hampson et al., 2001, 2013). Hawaii Study participants were initially surveyed as children, part of an original community sample of elementary school students on the islands of Oahu and Kauai, and have been re-contacted as adults to complete surveys approximately every 2 years. The sample is known for its ethnic and cultural diversity, with the three most prominent ethnic identifications in this current sample being Japanese Americans (36.4%), European Americans (20.0%), and Native Hawaiian or other Pacific Islanders (17.8%). With respect to socioeconomic status, participants were asked to report their highest level of education on a 9-point scale, with the median level as “some college/community college,” with almost all participants (98%) reporting at least a high school graduation or equivalent.

With the exception of demographics (assessed in early assessments) and the Big Five personality data (from the sixth assessment), all data for this study come from the seventh survey assessment in the Hawaii Study, the first to assess sense

of purpose in this sample. Most participants ( $n=643$ ) also completed the previous assessment occasion, 2 years earlier, during which Big Five personality traits were assessed; sample sizes thus differ for analyses controlling for personality traits. Participants provided informed consent prior to participation in the study, and all procedures were approved by the ethics boards associated with relevant institutions.

## Measures

**Purpose.** Purpose was assessed using the Life Engagement Test (Scheier et al., 2006). Participants responded to six items, such as “there is not enough purpose in my life” (reverse scored), on a scale from 1 (“strongly disagree”) to 5 (“strongly agree”). Reliability was strong in the current sample ( $\alpha = .80$ ), and participants’ scores were calculated by averaging their responses across items (mean ( $M$ )=4.20, standard deviation ( $SD$ )=0.61).

**Health behaviors.** Participants responded to a series of health behavior questions, including five single-item assessments for the potential mediators of interest. For strenuous and moderate activity, participants responded on a 5-point scale from 1 (“zero times”) to 5 (“seven or more times”) how frequently they engaged in each type of exercise in “a typical 7-day period during the past year.” Examples were given for both strenuous exercise (“running, jogging, stair stepping, soccer, surfing, basketball, martial arts, kayaking, paddling, windsurfing, vigorous swimming, and long-distance bicycling”;  $M=1.98$ ,  $SD=1.19$ ) and moderate exercise (“fast walking, sailing, tennis, easy bicycling, volleyball, gardening, badminton, easy swimming, popular, and folk dancing”;  $M=2.69$ ,  $SD=1.28$ ). For vegetable intake, participants reported how frequently in the past month they ate “vegetables (not salad or potatoes)” from 1 (“not at all”) to 7 (“two or more times a day”;  $M=4.45$ ,  $SD=1.60$ ). Flossing was assessed by asking participants to respond on 1 (“daily”) to 3 (“seldom”) scale (reverse scored) to the question “How often do you floss?” ( $M=2.41$ ,

$SD=0.80$ ). Sleep quality was assessed by asking participants to respond on a 0 (“very good”) to 3 (“very bad”) scale (reverse scored) to the question “During the past month, how would you rate your sleep quality overall?” ( $M=1.96$ ,  $SD=0.72$ ).

**Self-rated health.** Self-rated health was assessed with a single item, “Compared to others of your same age and sex, would you say that in general your health is?” Participants responded from 1 (“poor”) to 5 (“excellent”) and with participants on average reporting good health ( $M=3.29$ ,  $SD=0.95$ ).

**Big Five personality traits.** During the previous assessment, 2 years earlier, personality traits were assessed using the Big Five Inventory (John and Srivastava, 1999). Participants respond to the 44-item inventory on a scale from 1 (“very inaccurate”) to 5 (“very accurate”) with respect to how personally descriptive each item is. Sample items include “Is talkative” (extraversion,  $\alpha = .83$ ), “does a thorough job” (conscientiousness,  $\alpha = .78$ ), “is depressed, blue” (neuroticism,  $\alpha = .81$ ), “is helpful and unselfish with others” (agreeableness,  $\alpha = .78$ ), and “is original, comes up with new ideas” (openness,  $\alpha = .81$ ). Responses were averaged across items to create participants’ scores for each trait.

## Analysis plan

We first sought to establish the associations between sense of purpose, the examined health behaviors, and self-reported health using correlational analyses; next, we performed partial correlations to examine whether these associations held when controlling for demographics (gender, age, highest level of education attained, and ethnicity: European American, Japanese, or Hawaiian-American or other Pacific Islander) and the Big Five personality traits. As a corollary to the past work with single-mediator models, bootstrapping tests of mediation were performed separately for each health behavior using the SPSS process macro provided by Hayes (2013). Finally, the same macro was

**Table 1.** Associations between sense of purpose and self-reported health and health behaviors, initially, controlling for demographics and then controlling for the Big Five personality traits.

	Associations with sense of purpose		
	Zero-order correlation	Control for demographics	Control for demographics and Big Five
Self-rated health	.29*	.26*	.15*
Strenuous exercise	.18*	.19*	.16*
Moderate exercise	.18*	.18*	.18*
Vegetable intake	.18*	.14*	.11*
Flossing behavior	.13*	.10*	.07
Sleep quality	.21*	.21*	.10*

Demographics include gender, age, highest education attained, and three dummy variables reflecting the most common ethnicities in the sample (European American, Japanese, and Native Hawaiian or other Pacific Islander). Sample sizes range from  $n=711$  to 720, when controlling for demographics, and between  $n=622$  and 631, when controlling for demographics and Big Five traits.

\* $p < .05$ .

employed for testing a multiple-mediator model that included all health behaviors simultaneously as potential mediators. In all mediation models, we retained the same control variables as in the partial correlations for continuity.

## Results

First, the correlations of interest between sense of purpose, health behaviors, and self-rated health are presented in Table 1. Participants reporting higher sense of purpose also reported a greater likelihood to enact all health behaviors of interest and higher self-rated health. We then examined whether these zero-order associations held when controlling first for demographic covariates and then when controlling for demographics along with the Big Five personality traits. All associations between purpose, health behavior, and self-rated health remained significant when controlling for demographics, but the correlation between flossing behavior and sense of purpose failed to reach significance when also controlling for the Big Five personality traits.

Next, in line with the approach taken by most previous studies, we examined each of these health behaviors as separate explanations for the purpose–health association. Table 2 presents the results of these single-mediator

models, controlling for demographics and the Big Five personality traits. For all five models, sense of purpose had both a significant direct effect on self-rated health and an indirect effect through the health behavior of interest. However, the indirect effect estimates often were relatively modest in magnitude, leading us to examine whether these five health behaviors present unique explanatory value when considered simultaneously. Table 3 presents the findings of the multiple-mediator model with all five behaviors considered. In this model, moderate activity no longer proved a significant mediator, but all other behaviors were unique, significant mediators. The direct effect of sense of purpose on self-rated health was non-significant with all five mediators in the model,  $b = .08$ ,  $t = 1.27$ ,  $p = .20$ .

## General discussion

Although research has consistently demonstrated a link between sense of purpose and physical health, assessed both subjectively (Hill et al., 2015; Scheier et al., 2006) and objectively (Boyle et al., 2009; Hill and Turiano, 2014), further work is still needed to understand the mechanisms explaining these associations. This study provides one of the first efforts to examine multiple components of the healthy lifestyle as unique mediators

**Table 2.** Results of bootstrapped single-mediator models performed separately for each health behavior as an explanation of the link between purpose and self-rated health, controlling for demographics and the Big Five personality traits.

Health behavior	Direct effect <i>b</i> (SE)	Indirect effect <i>b</i> (SE)	95 percent CI	Full model <i>R</i> <sup>2</sup>
Strenuous exercise	.15 (.06)*	.05 (.02)*	.021–.084	.270
Moderate exercise	.15 (.06)*	.04 (.01)*	.018–.077	.248
Vegetable intake	.20 (.06)*	.02 (.01)*	.002–.050	.232
Flossing behavior	.20 (.06)*	.02 (.01)*	.003–.041	.232
Sleep quality	.18 (.06)*	.04 (.02)*	.012–.090	.273

SE: standard error; CI: confidence interval.

Demographics include gender, age, highest education attained, and three dummy variables reflecting the most common ethnicities in the sample (European American, Japanese, and Native Hawaiian or other Pacific Islander). Full model *R*<sup>2</sup> refers to the multiple regression model predicting self-rated health is from purpose, demographics, the Big Five personality traits, and the single mediator of interest.

\**p* < .05.

**Table 3.** Results of bootstrapped multiple-mediator model examining health behaviors as unique explanations of between purpose and self-rated health, controlling for demographics and the Big Five personality traits.

Health behavior	Indirect effect <i>b</i> (SE)	95 percent CI
Strenuous exercise	.04 (.01)*	.016–.072
Moderate exercise	.02 (.01)	–.005–.045
Vegetable intake	.01 (.01)	–.004–.035
Flossing behavior	.01 (.01)	–.001–.031
Sleep quality	.03 (.02)*	.006–.076

SE: standard error; CI: confidence interval.

Demographics include gender, age, highest education attained, and three dummy variables reflecting the most common ethnicities in the sample (European American, Japanese, and Native Hawaiian or other Pacific Islander). For the multiple-mediator model, the full model *R*<sup>2</sup> was .319 for predicting self-rated health from purpose, demographics, all healthy lifestyle behaviors, and the Big Five personality traits.

\**p* < .05; *n* = 603.

of the purpose–health association. Participants who reported a higher sense of purpose also reported greater strenuous and moderate activity, likelihood to eat vegetables and floss, as well as better quality sleep. All these associations held even when controlling for the Big Five personality traits, with the exception of flossing behavior. In single-mediator models, each of these behaviors was a significant mediator of the association between purpose and self-rated health. However, the multiple-mediator model suggests that only vigorous activity and sleep quality were unique mediators of the association when all potential mediator variables were included, which follows from past work emphasizing the linkages between

purposefulness and activity (e.g. Hooker and Masters, 2016) and better sleep (Kim et al., 2015). Overall, these findings point to the importance of considering healthy lifestyle habits as a prominent explanation for why purposeful individuals experience better health outcomes, particularly given that the direct effect of purpose was reduced to non-significance when all the mediators were included.

It is worth noting that the behaviors examined here may serve as proxies for other mechanisms or behaviors. For instance, if an individual flosses regularly, that person is likely to participate in other healthy activities, which may prove more valuable for understanding the health

benefits associated with a sense of purpose. In addition, although sleep quality has been linked previously to levels of purpose (Kim et al., 2015), it is likely that this variable reflects more than simply an individual's positive sleep habits. Sleep quality also is associated with reduced stress (e.g. Cartwright and Wood, 1991; Healey et al., 1981), and research suggests that individuals with a sense of purpose report lower stress levels (e.g. Scheier et al., 2006). Accordingly, future research should disentangle whether the health behaviors examined here are directly responsible for the purpose–health association or whether some may provide insight into this relationship by virtue of being “proxies” for other lifestyle activities or psychological health explanations.

One limitation of this work is that the mediation models we present rely on cross-sectional data. Modeling causal processes using mediation models relies in part on measuring variables in the order of their temporal precedence. Thus, these mediation results are not intended to provide strong evidence for specific causal mechanisms. Even in instances where temporal precedence is accurately represented, alternative hypotheses need to be considered. For instance, although work has shown that sense of purpose longitudinally predicts health outcomes (e.g. Hill and Turiano, 2014), one also would expect that healthier individuals may feel more physically able to act upon their goals for life; thus, better physical health likely also promotes a sense of purpose in life. Although some work has failed to show physical health as a predictor of changes in sense of purpose (Hill et al., 2015), research is needed to investigate the bidirectionality of the findings presented here.

That said, this study provides valuable evidence that none of the individual mediators examined provided a full account of the purpose–health association. This work helps to link past health psychology studies in which these mediators were tested largely in isolation from one another. Instead, this work suggests that researchers need to account simultaneously for how living a purposeful life may promote components such as physical activity,

dietary, and self-care health behaviors, as well as sleep quality. Such a perspective aligns with the theoretical work on having a purpose in life that suggests that purpose is best viewed as a multifaceted construct that influences both self-regulatory capacity and specific behaviors (McKnight and Kashdan, 2009). Moreover, these findings provide further evidence that the health benefits associated with sense of purpose cannot be fully attributable to broad personality traits, such as the Big Five, another important point when building theoretical frameworks for understanding the benefits associated with purpose.

This study is limited, though, in ways that should direct future research. First, all measures employed were self-report in nature and thus potentially suspect to reporter biases. As such, future research is needed that employs objective measures of health and health behavior. However, it is worth noting that if the current findings resulted solely from participants presenting a positive impression, it is unlikely that the specific health behaviors would have provided unique associations with sense of purpose. Instead, we would expect the shared variance resulting from a positivity bias to result in greater overlap across mediators. Second, as noted earlier, longitudinal data are needed to provide better insight into the causal direction of these associations. Third, the current participants were involved in a long-running study of health among people who grew up living in Hawaii, and thus, further work is needed to understand whether these findings generalize to other samples. Moreover, we focused on brief measures for sense of purpose and health behavior to reduce participant burden, although more comprehensive measures should be considered in future research. These caveats aside, the findings again support the case that a purpose-driven life may also be a healthier life.

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