



# Personality and earnings lost: the economic costs of work cut back days due to physical and mental health

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*Personality traits have emerged as significant contributors to physical and mental health, as well as various economic outcomes including income. Few studies have explored whether personality is related to the frequency of days lost on the job due to physical or mental health issues, and the subsequent economic losses as a result. The current study bridged the health, economic, and personality variables to determine whether personality was associated with earnings lost due to work cut back days from poor physical or mental health. We found, both concurrently and over a 10 year follow up, that high neuroticism and low openness were associated with more earnings lost due to mental health, while low extraversion was associated with more earnings lost due to physical health. These findings are interpreted in light of the effects that personality may have on an individual's career and financial outcomes, and the economic effects of untreated physical and mental health problems.*

**Keywords:** personality traits; mental health; physical health; work cutbacks; economic costs

Personality traits are associated with both health (Ozer & Benet-Martinez, 2006) and wealth (Duckworth, Weir, Tsukayama, & Kwok, 2012; Nyhus & Pons, 2005), yet these are not unrelated. Poor physical or mental health can take a toll on wealth in the form of lost earnings (Kessler et al., 2008) and the concept of “lost earnings due to health reasons” has been the focus of recent policy-related research (Kessler et al., 2008). However, we know little about how personality traits influence health-related lost earnings. The goal of the current study was to examine the role of personality in the monetary cost associated with the number of workdays lost due to mental and physical health reasons. Specifically, we tested whether personality traits were associated with health-related lost earnings.

## Personality and income

A number of personality traits have been linked to income. For example, individuals who are emotionally stable, conscientious, motivated, open to experience, and not agreeable tend to have higher earnings over time (Duckworth et al., 2012; Furnham & Cheng, 2013; Nyhus & Pons, 2005; Palifka, 2009; Sutin, Costa, Miech, & Eaton, 2009). This may be due to a number of individual differences, including the fact that individuals with these traits tend to be more achievement oriented, more intelligent, have higher cognitive functioning (Higgins, Peterson, Pihl, & Lee, 2007), can cope with setbacks and plan for the future (Prenda & Lachman, 2001), and have the desire to take the

necessary steps to achieve financial success in their careers. In terms of long-term economic outcomes, Duckworth and colleagues (2012) used data from the Health and Retirement Study (HRS) to examine personality in relation to lifetime wealth and income. They found that higher agreeableness was associated with lower income and lifetime wealth, while emotional stability (low neuroticism) had a small association with wealth, and none with income. Openness had an inverse relationship with wealth and income, but only after controlling for demographics and cognitive ability, while conscientiousness had the strongest positive links to both wealth and income.

## Personality and health

Personality traits have been linked to various physical and mental health outcomes. Specifically, low agreeableness has been associated with lower overall physical health (Miller, Smith, Turner, MGuijarro, & Hallet, 1996; Ozer & Benet-Martinez, 2006), while conscientiousness and emotional stability were associated with adaptive health behaviors and longevity (Mroczek, Spiro, & Turiano, 2009; Turiano, Hill, Roberts, Spiro, & Mroczek, 2012). In terms of mental health, neuroticism was linked to a greater propensity towards anxiety disorders, depression, and work-related burnout (Armon, Shirom, & Melamed, 2012; Trull & Sher, 1994). Extraversion was linked to lower depression (Trull & Sher, 1994), and conscientiousness was linked to lower work-related burnout (Armon et al., 2012). Others have found that neuroticism, extraversion and conscientiousness are predictive of work absenteeism, such that individuals who are high on neuroticism and extraversion and low on conscientiousness are more likely to be absent from work (Conte & Jacobs, 2003; Judge, Thoresen,

Table 1. Descriptive statistics, mean, SD, range

	Concurrent models			Longitudinal models		
	<i>Mean</i>	<i>SD</i>	<i>Range</i>	<i>Mean</i>	<i>SD</i>	<i>Range</i>
age	45.92	12.40	20-75	47.26	12.39	24-75
sex	1.52	0.5	1-2	1.55	0.50	1-2
education	6.99	2.45	1-12	7.13	2.48	1-12
employment status	1.49	0.81	1.00-4.00	2.78	2.35	1-11
conscientiousness	3.43	0.44	1.00-4.00	3.45	0.43	1.00-4.00
agreeableness	3.48	0.49	1.00-4.00	3.48	0.49	1.00-4.00
neuroticism	2.24	0.66	1.00-4.00	2.22	0.66	1.00-4.00
openness	3.02	0.53	1.00-4.00	3.01	0.51	1.00-4.00
extraversion	3.19	0.56	1.00-4.00	3.19	0.55	1.00-4.00
days lost, mental health (MH)	.06	0.98	0-30	.10	1.01	0-20
days lost, Physical health (PH)	.65	3.41	0-30	1.02	0.99	0-30
income lost, MH	2.00	43.76	\$0-2,125.00	7.76	103.74	\$0-3,750.00
Income lost, PH	44.82	343.98	\$0-10,096.15	71.78	463.75	\$0-10,384.62
daily income	108.28	103.93	\$0-108.28	136.37	152.94	\$0-769.23
<i>N</i>	5,505			3,851		

& Martocchio, 1997). Recent work also found that personality traits were associated with workdays lost due to physical health (Turiano, Pitzer, et al., 2012), specifically, that neuroticism and openness were associated with more work reductions, while extraversion and conscientiousness were associated with fewer work reductions. Furthermore, they found that change in conscientiousness was associated with fewer work reductions.

### Earnings lost due to physical and mental health

There is a burgeoning literature on the economic cost of health issues. Much of this work has been geared towards informing policy regarding the treatment of coverage of mental disorders. Recent work has found that individuals with low self-reported mental well-being and work capacity have greater odds of missing work days (sickness benefit compensated days) (Bertilsson, Vaez, Waern, Ahlborg, & Hensing, 2014), and that chronic conditions contribute to a 17.8 to 36.4% decrement in ability to work (Collins et al., 2005). The cost of this absenteeism was estimated at 10.7% of the total labor costs in the U.S., 6.8% of which can be linked to impairment alone (Collins et al., 2005).

There is a growing body of literature indicating that physical and mental health issues have steep economic costs. For example, Kessler et al. (2008) estimated the annual monetary cost of serious mental illness (including anxiety disorders, mood disorders, impulse control disorders, and non-affective psychosis) in the United States at \$193 billion (USD). Data from HRS indicated that dementia has steep monetary cost, between \$157 billion and \$215 billion in 2010 alone (Hurd, Martorell, Delavande, Mullen, & Langa, 2013). Another recent study estimated mental health (not including dementia) losses in a Spanish sample (Barbaglia et al., 2012) and they found that individuals with mental health disorders make 55% less than those without mental health issues. Moreover, they estimated that the impact of serious mental disorders in Spain was around 1.4 million euros annually. Mitchell and Bates (2011) assessed the relationship between physical health and productivity loss among employees, finding that individuals with health conditions and who were at high risk

for health problems were associated with an average of \$15.00 (high cholesterol) to \$1,600.00 (cancer) per year per person in productivity costs to the employer, with a weighted average of \$243.00 (median of \$328.00), as compared to individual without health conditions (Mitchell & Bates, 2011). All told, this literature suggests that physical and mental health issues have steep economic costs. Few have examined, however, individual differences in these costs. That is, are certain individual factors associated with individual economic costs due to health issues? We examined personality traits as individual difference factors that may help explain some of the economic costs of mental and physical health.

### Current study

The goal of the current study was to explore personality factors associated with the economic effects of mental and physical health issues. Given the clear associations between personality and both income and health, we expected that personality would predict physical and mental health-related lost earnings. We hypothesized that higher neuroticism and agreeableness would be associated with more health-related lost earnings, while extraversion, openness, and (most strongly) conscientiousness would be associated with fewer health-related lost earnings. We expected to find these associations both concurrently and over a 10 year follow up.

## METHODS

### Sample

The Midlife in the United States (MIDUS) study currently has two measurement occasions. The first was collected in 1994-1995, and the second in 2004-2005. Individuals who completed all relevant data for the current study resulted in a sample of 5,505 at Time 1, and 3,851 at Time 2. Individuals completed all data via phone interviews, and paper and pencil questionnaires.

Table 2. Inter-correlations among Big Five traits at Time 1 and Time 2

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Time 1										
1. Openness	--	<b>-.17</b>	<b>.27</b>	<b>.51</b>	<b>.34</b>	.69	-.14	.24	.34	.21
2. Neuroticism	-.17	--	<b>-.20</b>	<b>-.16</b>	<b>-.05</b>	-.18	.64	-.15	-.14	-.05
3. Conscientiousness	.27	-.20	--	<b>.28</b>	<b>.29</b>	.23	-.15	.63	.21	.21
4. Extraversion	.51	-.16	.28	--	<b>.53</b>	.36	-.12	.20	.70	.35
5. Agreeableness	.34	-.05	.29	.53	--	.22	-.05	.20	.36	.64
Time 2										
6. Openness	.69	-.18	.23	.36	.22	--	-.21	.34	.51	.33
7. Neuroticism	-.14	.64	-.15	-.12	-.05	<b>-.21</b>	--	-.20	-.20	-.11
8. Conscientiousness	.24	-.15	.63	.20	.20	<b>.34</b>	<b>-.20</b>	--	.28	.29
9. Extraversion	.34	-.14	.21	.70	.36	<b>.51</b>	<b>-.20</b>	<b>.28</b>	--	.50
10. Agreeableness	.21	-.05	.21	.35	.64	<b>.33</b>	<b>-.11</b>	<b>.29</b>	<b>.50</b>	--

Note: All correlations are significant at  $p < .01$  or lower; coefficients in bold represent correlations among traits at a given measurement occasion

## Measures

### Control variables

All models controlled for demographic variables thought to potentially influence our outcome variables, specifically, age ( $M=45.92$ ,  $SD=12.40$ ), gender (47% male), education (61.5% completed at least some college), and employment status (66.5% of the sample worked at least part-time at Time 1). See Table 1 for descriptive data on all variables.

### Earnings lost

Our outcome variable, earnings lost (due to physical health reasons or mental health reasons), was calculated by multiplying daily income (in U.S. dollars) by workdays lost. Daily income was estimated at Time 1 and Time 2 from the individual's total yearly wages (not including pensions, assets, or other sources of income) by dividing wages by the number of workdays in a given year (260), not including holidays or vacation time. For workdays lost, participants were asked to report, at both Time 1 and Time 2, "in the past 30 days, how many days were you totally unable to go to work or carry out your normal household work activities because of your physical or mental health? How many were due only to physical? How many were due only to mental?" By multiplying workdays lost by daily income, we captured the amount of dollar earnings in a given month lost due to physical and mental health reasons. This is comparable to the technique Kessler et al. (2008) and others used to calculate similar lost-earnings variables.

### Personality traits

Our key explanatory variables for this study were the Big-Five traits, assessed in MIDUS 1 and 2 via adjectives (Prenda & Lachman, 2001). Participants were asked the extent to which 25 adjectives described them, ranging from 1 (*not at all*) to 4 (*a lot*). The adjectives were moody, worrying, nervous, and calm (*neuroticism*,  $\alpha=.74$ ); outgoing, friendly, lively, active, and talkative (*extraversion*,  $\alpha=.76$ ); organized, responsible, hardworking, and careless (*conscientiousness*,  $\alpha=.58$ ); helpful, warm, caring, soft-hearted, and sympathetic (*agreeableness*,  $\alpha=.80$ ); and creative, imaginative, intelligent, curious, broad minded, sophisticated, and adventurous (*openness*,  $\alpha=.77$ ). Additional psychomet-

ric information on this scale can be found in Prenda and Lachman (2001), Graham and Lachman (2012), and Turiano, Pitzer, Armour, Karlamangla, Ryff and Mroczek (2012). The relatively low reliability of conscientiousness has been noted, and any effects of this trait on our key outcomes were interpreted with caution. Inter-correlations among all five traits at both Time 1 and Time 2 can be found in Table 2.

## RESULTS

### Data analysis

Two sets of regression models were computed. Each set contained two models, one for each outcome variable (earnings lost due to mental health, earnings lost due to physical health). Our first set of regression models was a concurrent analysis: Time 1 personality predicted Time 1 Earnings Lost. The second set of analyses was prospective: Time 1 personality predicted Time 2 earnings lost. For all models, step 1 included the covariates age, sex, education, and employment status, and step 2 included the five personality traits (conscientiousness, agreeableness, neuroticism, openness, and extraversion). Tables 3 and 4 provide a summary of these analyses and include results for personality predicting work cut back days and daily income, for reference.

### Concurrent models: personality (time 1) predicting earnings lost due to mental and physical health (time 1)

Agreeableness predicted earnings lost to mental health days, meaning that a one-unit increase in agreeableness was associated with \$3.12 lost due per month due to mental health. To further clarify the meaning of this finding, we regressed daily income and days lost due to mental health on agreeableness. Agreeableness predicted lower income, but not days lost due to mental health, suggesting that the effect of agreeableness on income lost was due to the lower income of people high in agreeableness rather than to days lost. In other words, high agreeableness was associated with lower income, but a greater cost was associated with mental health days. Individuals who are high in

Table 3. Personality predicting earnings lost due to physical health (PH), mental health (MH), work days lost due to PH &amp; MH and daily income (Time 1)

	Earnings lost MH			Days lost MH			Earnings lost PH			Days lost PH			Income		
	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$
Controls															
Age	-.06	.05	-.02	-.001	.001	-.02	.14	.38	.01	-.003	.004	<b>.02<sup>t</sup></b>	.36	.09	<b>.04***</b>
Sex	1.89	1.23	.02	-.04	.03	.02	13.90	9.72	.02	.12	.10	.02	-48.88	2.36	<b>-.24***</b>
Ed	.15	.13	.01	-.01	.01	<b>-.03*</b>	1.63	1.92	.01	-.07	.02	<b>-.05***</b>	11.66	.46	<b>.38***</b>
Employed	-1.00	.75	-.02	.04	.02	<b>.03*</b>	-17.23	5.91	<b>-.04**</b>	.35	.06	<b>.08***</b>	-53.62	1.44	<b>-.42***</b>
Personality															
Consc	-2.26	1.41	-.02	-.07	.03	<b>-.03*</b>	-.33	11.08	.00	-.22	.11	<b>-.03*</b>	15.50	2.69	<b>.07***</b>
Agree	3.12	1.45	<b>.04*</b>	.05	.03	.03	17.26	11.44	.03	.21	.12	<b>.03<sup>t</sup></b>	-18.98	2.77	<b>-.09***</b>
Neuro	2.20	.90	<b>.03*</b>	.06	.02	<b>.04**</b>	1.32	7.10	.003	.15	.07	<b>.03*</b>	.76	1.72	.01
Open	.18	1.33	.002	.04	.03	.02	13.87	10.49	.02	.26	.11	<b>.04*</b>	6.63	2.55	<b>.03**</b>
Extra	-1.85	1.32	-.02	-.03	.03	-.02	-23.25	10.37	<b>-.04*</b>	-.27	.10	<b>-.04*</b>	7.02	2.51	<b>.04**</b>
<i>R</i> <sup>2</sup>	.004			.01			.003			.01			.41		
<i>N</i>	5,749			5,752			5,735			5,752			5,505		

\* $p < .5$ , \*\* $p < .01$ , \*\*\* $p < .001$ , <sup>t</sup> $p < .10$ 

Note: Ed=Education level; Employed=Employment status; Consc=Conscientiousness; Agree=Agreeableness; Neuro=Neuroticism; Open=Openness; Extra=Extraversion

Table 4. Personality traits (Time 1) predicting earnings lost due to physical health (PH), mental health (MH), work days lost due to PH &amp; MH and daily income (Time 2)

	Earnings lost MH			Days lost MH			Earnings lost PH			Days lost PH			Income		
	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$
Controls															
Age	-.35	.13	<b>-.05**</b>	-.003	.001	<b>-.03**</b>	.13	.57	-.004	.02	.01	<b>.05**</b>	-2.52	.18	<b>-.20***</b>
Sex	-1.53	3.04	-.01	.01	.03	.003	-4.33	13.70	-.01	.21	.12	<b>.03<sup>t</sup></b>	-68.41	4.39	<b>-.22***</b>
Ed	.98	.61	.03	.004	.01	.01	2.89	2.75	.02	-.05	.02	<b>-.03*</b>	13.22	.88	<b>.21***</b>
Employed	1.62	.67	<b>.04*</b>	.04	.01	<b>.09***</b>	3.93	3.05	.02	.27	.03	<b>.16***</b>	-17.32	.96	<b>-.27***</b>
Personality															
Consc	-1.96	3.52	-.01	-.06	.04	<b>-.03<sup>t</sup></b>	2.25	15.87	.002	-.19	.14	-.02	14.43	5.15	<b>.04**</b>
Agree	3.60	3.62	.02	.04	.04	.02	-32.18	16.35	<b>-.04*</b>	-.17	.15	-.02	-21.56	5.20	<b>-.07***</b>
Neuro	6.95	2.26	<b>.05**</b>	.08	.02	<b>.05**</b>	12.51	10.17	.02	.17	.10	<b>.03<sup>t</sup></b>	6.79	3.25	<b>.03*</b>
Open	-7.19	3.37	<b>-.04*</b>	-.02	.03	-.01	28.15	15.20	<b>.03<sup>t</sup></b>	.21	.14	.03	4.30	4.88	.01
Extra	2.19	3.31	.02	-.04	.03	-.03	-17.47	14.91	-.02	-.25	.13	<b>-.04<sup>t</sup></b>	16.78	4.76	<b>.06***</b>
<i>R</i> <sup>2</sup>	.01			.01			.003			.04			.32		
<i>N</i>	4,587			4,603			4,516			4,603			3,851		

\* $p < .5$ , \*\* $p < .01$ , \*\*\* $p < .001$ , <sup>t</sup> $p < .10$ 

Note: Ed=Education level; Employed=Employment status; Consc=Conscientiousness; Agree=Agreeableness; Neuro=Neuroticism; Open=Openness; Extra=Extraversion

agreeableness, who also have high income, lose the most days due to mental health issues (Table 3).

Neuroticism also predicted earnings lost due to mental health. A one-unit increase in neuroticism was associated with \$2.20 lost per month due to mental health. Neuroticism was not associated with income, but with more lost workdays due to mental health reasons, thus explaining why they have more lost earnings.

The final concurrent effect we found was for extraversion predicting earnings lost due to physical health. A one-unit *decrease* in extraversion was associated with \$23.25 lost due to physical health, suggesting that the less extraverted a person was, the more money that person lost. Extraversion was also associated with higher income and fewer physical health days lost, meaning that the effect of extraversion on money lost can be explained in terms of both. Individuals who are high in extraversion lost fewer workdays due to physical health, and therefore are losing less money.

### Longitudinal models: personality (time 1) predicting earnings lost due to mental and physical health (time 2)

Findings from these analyses showed that, similar to the concurrent analyses, neuroticism predicted lost earnings due to mental health. A one-unit increase in neuroticism was associated with \$6.95 lost due to mental health per month. Neuroticism was associated with more lost workdays due to mental health and higher income. Individuals high in neuroticism are more likely to lose days due to mental health and also have higher earnings overall, therefore these days lost come at a higher cost (Table 4).

Openness also predicted earnings lost due to mental health, indicating that a one-unit decrease in openness was associated with \$7.19 lost due to mental health days.

Agreeableness predicted earnings lost due to physical health, indicating that individuals lower in agreeableness

Table 5. Concurrent and longitudinal models: personality traits predicting earnings lost due to physical health (PH), mental health (MH), zeros excluded

	Earnings lost MH			Days lost MH			Earnings lost PH			Days lost PH		
	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$
Controls												
Age	-6.24	5.12	-.18	1.32	4.57	.014	-12.11	9.28	-.18	-15.77	5.05	-.16**
Sex	-29.02	129.91	-.03	134.25	111.93	-.06	-452.06	215.77	-.32*	-350.09	133.09	-.14**
Ed	30.80	20.25	.23	44.91	21.72	.10*	3.98	40.99	.01	38.41	24.18	.08
Employed	-156.43	56.93	-.40**	-278.09	56.57	-.24***	-134.78	106.55	-.18	-58.37	68.81	-.04
Personality												
Consc	-26.44	118.82	-.04	92.97	123.86	.04	241.93	193.91	.18	201.68	144.12	.07
Agree	224.14	158.95	.17	63.02	140.87	-.03	182.14	231.19	.12	-287.54	148.40	-.12 <sup>†</sup>
Neuro	-26.31	96.63	-.04	-123.49	80.44	-.08	-22.03	125.92	-.02	37.83	93.92	.02
Open	-140.47	131.52	-.21	56.75	112.98	.03	-678.66	242.40	-.48**	155.90	133.94	.07
Extra	-8.44	113.61	-.01	-68.85	106.40	-.04	279.27	194.41	.22	54.08	131.12	.03
<i>R</i> <sup>2</sup>	.13			.08			.10			.06		
<i>N</i>	53			436			63			436		

\* $p < .5$ , \*\* $p < .01$ , \*\*\* $p < .001$ , <sup>†</sup> $p < .10$

Note: Ed=Education level; Employed=Employment status; Consc=Conscientiousness; Agree=Agreeableness; Neuro=Neuroticism; Open=Openness; Extra=Extraversion

lost more due to physical health days. A one-unit decrease in agreeableness was associated with \$32.18 lost due to physical health. Agreeableness did not predict physical health days, but did predict daily income, such that high agreeableness was associated with lower income. This suggests that the low-agreeable individuals with high income were taking the most days, and thus losing the most earnings

#### Accounting for excess zeros

One issue encountered with the above analyses was the size of our effects. While the predictive contribution of personality to income lost due to work cutback days is important, the fact that these significant effects only add up to a few hundred dollars a year at the *most* raises the question of so-called “clinical significance” or real-world significance. A large majority of the MIDUS sample reported taking zero days due to either physical or mental health, explaining why the effect sizes were so low, even after controlling for employment status and age (which accounts for people who are unemployed, voluntarily not working, or retired). Furthermore, the nature of the cutback days question in the MIDUS questionnaires leaves room for even the retired and/or unemployed to report days lost. In light of this, we ran additional analyses and excluded cases reporting zero cutback days (Table 5). What we found was an expected drop in our sample ( $N=53-63$  for mental health;  $N=436$  for physical health), thus greatly reducing our power. However, we also found a substantial increase in effect sizes. The effect of openness on Time 2 earnings lost due to mental health was significant ( $p < .01$ ), such that a one-unit decrease in openness was associated with \$678.66 lost per month due to mental health. When scaled up to a year (assuming a person takes the same average number of days per month across a year), this effect means that low openness was associated with \$8,143.92 lost per year. Similarly, we see a marginal effect of agreeableness ( $p < .10$ ), such that a one unit decrease in agreeableness was associated with \$287.54 lost per month due to physical health cutbacks days (\$3,450.48 per year). These results

indicate that, among people who *do* report work cutback days due to either mental or physical health, personality predicts a fairly substantial loss in earnings.

## DISCUSSION

This study highlights the economic effects of mental and physical health issues as a function of personality. Regardless of an individual’s objective health status, the amount of earnings lost from missing work due to health issues varies based on an individual’s personality. In sum, we found that concurrently, high neuroticism, high agreeableness, and low extraversion were associated with more earnings lost. Over the 10 year follow up period, we found that, similarly, high neuroticism was associated with earnings lost, in addition to low openness and agreeableness. While these effects seem relatively small, if we scale these results up to a yearly loss, we see that lost earnings due to physical and mental health issues adds up to \$26.40-\$386.16 per year, or even higher (\$3,450.48-\$8,143.92) when limiting the sample to those who reported a cutback. Scaled up to the level of the population, this translates into many millions of dollars (or Euros, Yen, or Pounds Sterling, if discussing Europe, Japan or the UK) lost to individuals or employers annually. As Ozer and Benet-Martinez (2006) hint, even a small change in certain personality traits at the level of the population can have potential effects that are measureable in terms of large sums of money.

These results are not altogether surprising, particularly for neuroticism and agreeableness. Individuals high in neuroticism are typically less healthy (Armon et al., 2012; Smith, 2006) and have higher stress reactivity, anxiety (Mroczek & Almeida, 2004), and lower job satisfaction (Templer, 2012), so it is to be expected that these individuals would also suffer greater economic loss from sick days. As for agreeableness, given the prior literature that low agreeableness is associated with greater job success (measured by income) and higher economic health outcomes (Duckworth et al., 2012) the concurrent linking low agreeableness to fewer earnings lost (due to mental health) is consistent with expectations. However, longitudinally we

find the opposite to be the case, and for physical health reasons. It appears that, over the longer term, having high agreeableness means taking less time off. Agreeableness is also associated with other, more positive career indicators, such as cooperation (Witt, Burke, Barrick, & Mount, 2002), and job satisfaction (Judge, Heller, & Mount, 2002). Thus, while the current study found consistent evidence regarding agreeableness and income-based job outcomes, other more positive aspects of agreeableness may be at play here as well. Additionally, a personality scale that measures other facets of agreeableness (e.g., trust, sincerity), in addition to the somewhat more emotionally valenced adjective measured in this study may have yielded slightly different results. Lastly, the moderate but significant negative correlation between neuroticism and agreeableness may at least partially explain the lower income for agreeableness: individuals high in agreeableness tend to be lower in neuroticism, which in turn is also associated with lower income at Time 2.

The remaining results were consistent with our expectations: high extraversion was associated with fewer earnings lost due to physical health. An extraverted individual generally prefers social interaction to isolation, and thus is likely to choose to go to work in lieu of staying home alone in the face of physical illness. In this case, it is possible that an extraverted individual with a contagious ailment could cause economic losses for others by passing on their illness, though testing this is beyond the scope of the current study. High openness was associated with fewer earnings lost due to mental health: in the face of a mental illness or any mental health issue, an individual who is open to experience is likely to get the necessary treatment so that their lives will not suffer as a result. We did not detect any effects of conscientiousness on income lost due to either physical or mental health. However, the conscientiousness scale used in this data set has a relatively low reliability (.58). A stronger measure of conscientiousness may have elicited the hypothesized effects.

When removing the cases reporting zero cutback days, we see a substantive jump in effect sizes, however a marked drop in N and thus statistical power. We lost most of the effects reported above, and observe effects only for openness on Time 2 mental health, and a marginal effect of agreeableness on Time 2 physical health. However, by looking at the other non-significant effects in Table 4, nearly all of the other traits have fairly high effect sizes, particularly for mental health days, suggesting that a larger sample would likely have the power to detect these effects. One reason we may have observed so many cases reported zero days is that these data were collected in 1994/95 and in 2004/05. Only relatively recently has mental health gained public attention in the U.S., and the stigma associated with mental health issues has begun to drop. Ten-to-twenty years ago, this stigma surrounding mental health was much greater than it is today, and as such, we expect that today individuals would be more willing to take mental health days if needed, and also report them in a survey. Future studies should include data from more recent measurement occasions in order to account for this historical effect. Additionally, future studies should frame the work cut back days question in a way that allows for easier exclusion of unemployed or retired individuals.

All told, this study can be used to inform the public about the potential economic costs of having certain levels of certain personality traits as well as unchecked physical/mental health problems. Knowing the concurrent and long-term associations can help researchers understand what aspects of a person's life could change to reduce the economic costs of physical and mental health.

There were several limitations to the current study. The data regarding work days lost is self-report, subjective, and the survey items only ask about cut back days in "the last 30-days." This means we only captured a small snapshot of individuals' mental and physical health, and as such these data may not be truly representative of their typical lives. Future studies can build upon this work by including more objective measures of work cut back days. Additionally, more precise definitions of reasons for mental and physical cut back days will lead to greater response accuracy.

## Conclusion

The current study presented evidence that personality traits can explain who experiences the greatest economic costs of health related cutbacks. Specifically, we found that high neuroticism and low openness were associated with more earnings lost due to mental health cutback days, while low extraversion was associated with more earnings lost due to physical health. Understanding the predictive factors behind health related work cutback days and subsequent economic costs is important for employees, employers, and the economy as a whole. The findings in this study can help employers identify individuals most likely to take days off due to their health, and create environments to help employees maximize their employees' health and subsequent productivity.

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