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## Clarifying the links between social support and health: Culture, stress, and neuroticism matter

Jiyoung Park<sup>1</sup>, Shinobu Kitayama<sup>1</sup>, Mayumi Karasawa<sup>2</sup>, Katherine Curhan<sup>3</sup>, Hazel R Markus<sup>3</sup>, Norito Kawakami<sup>4</sup>, Yuri Miyamoto<sup>5</sup>, Gayle D Love<sup>5</sup>, Christopher L Coe<sup>5</sup>, and Carol D Ryff<sup>5</sup>

<sup>1</sup>University of Michigan, USA

<sup>2</sup>Tokyo Christian Woman's University, Japan

<sup>3</sup>Stanford University, USA

<sup>4</sup>University of Tokyo, Japan

<sup>5</sup>University of Wisconsin, Madison, USA

### Abstract

Although it is commonly assumed that social support positively predicts health, the empirical evidence has been inconsistent. We argue that three moderating factors must be considered: (1) support-approving norms (cultural context); (2) support-requiring situations (stressful events); and (3) support-accepting personal style (low neuroticism). Our large-scale cross-cultural survey of Japanese and US adults found significant associations between perceived support and health. The association was more strongly evident among Japanese (from a support-approving cultural context) who reported high life stress (in a support-requiring situation). Moreover, the link between support and health was especially pronounced if these Japanese were low in neuroticism.

### Keywords

culture; neuroticism; social support; stress

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The last two decades of research in social and health psychology have established that availability of cohesive social support networks is integral to promoting both physical (Cohen and Wills, 1985; Kiecolt-Glaser and Glaser, 1989; O'Donovan and Hughes, 2008; see Uchino et al., 1996 for a review) and mental health benefits (Brewin et al., 2000; Kafetsios and Sideridis, 2006; Lakey and Cronin, 2008; see Lakey and Orehek, 2011 for a review). Conversely, the absence of such social resources, as typically captured by loneliness (Peplau and Perlman, 1982), presents a substantial health risk (e.g. Cacioppo et al., 2010; Shiovitz-Erza and Ayalon, 2010). Given the fundamental significance of social integration in health and well-being, it would come as rather surprising that some recent empirical papers have suggested that perceived support sometimes offers little benefit to health and adjustment. In this literature, by perceived support researchers typically mean the perception that one has received various emotional support such as compassion and

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**Corresponding author:** Jiyoung Park, University of Michigan, 530 Church Street, Ann Arbor, Michigan, 48109, USA. [pjiyoung@umich.edu](mailto:pjiyoung@umich.edu).

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encouragement from close others (see Bolger and Amarel, 2007 for a review). Summarizing this literature, Bolger and Amarel (2007: 458) note, 'most studies have found null or adverse relations between the receipt of support and adjustment'.

Several reasons have been put forth to account for the inconsistent relationships between perceived support and health, such as that perceived support may highlight one's incompetence or lack of efficacy (Bolger and Amarel, 2007), or that support could evoke feelings of indebtedness in the recipient, which in turn, may undermine self-esteem or self-efficacy (Gleason et al., 2003; Newsom, 1999). Social support can also draw one's attention to possible impositions and burdens on the provider of the support (Kim et al., 2008). Still another possibility is that the support received might not match the needs or expectations of the support recipient (Siewert et al., 2011). Furthermore, reverse causation might be operative: people with poor health might require more support from others (Seidman et al., 2006).

Drawing on these considerations, the present work more systematically examined several factors that can jointly moderate the linkage between perceived support and health status of the support recipient. The overarching framework was guided by a focus on factors that serve to highlight or conceal the emotional costs of receiving social support. We considered three such factors.

First, we anticipated that the emotional costs of perceived support would depend on a person's cultural background. Considerable evidence indicates that cultures vary in the degree to which independence or interdependence is normatively sanctioned and used to organize daily practices and meanings (Kitayama and Uskul, 2011; Markus and Kitayama, 1991, 2010). In western cultures, including the US society, independence of the self from others is highly sanctioned. In this cultural context, support may be perceived as particularly troubling because it compromises one's sense of independence from others (Uchida et al., 2008). In contrast, in East Asian cultures, especially in Japan, Korea, and China, interdependence of the self with others is strongly sanctioned. In this cultural context, support is likely to highlight the culturally endorsed and validated state of interdependence and, as a consequence, may be expected to entail less emotional cost. For example, if friends or family members are willing to provide the support one needs, the person may feel assured that he or she is succeeding in the task of interdependence. Thus, the support–health linkage would be stronger and more positive for Asian than for American adults.

Our second factor relates to perceived stress on the part of support recipients. Our analysis starts with an observation that, while perceived support is generally more norm-congruous in Asian cultures, it can sometimes be troubling even for Asians. Kim and colleagues (2008) have argued that, especially in Asian, interdependent cultural contexts, recipients of social support sometimes worry that they may be causing troubles for the support-providers. Accordingly, the linkage between perceived support and health might only become positive if Asians are protected from this particular type of worry associated with receiving support. We anticipated that Asians would feel less worry if the support they received was necessary and, thus, its receipt was seen as justified. Miller and Bersoff (1992) found that especially in Asian contexts, interpersonal support is viewed as a moral obligation when there is a need for it. Such a need is obviously present when individuals are facing life difficulties and thus are stressed. It was thus predicted that the positive association between perceived support and health would be most strongly evident among Asians who reported high levels of stress, thereby justifying the support they were receiving.

While Americans may also be concerned when they receive support, the nature of the concern they experience may be very different from the concern Asians experience. Because

Americans tend to be more independent rather than interdependent, what they worry about may have less to do with the potential impositions they place on the support providers; instead, they may worry more about the likelihood that the need for support is an indication of their own perceived incompetence or inefficacy (Bolger and Amarel, 2007). Note that while one's own stressful state can be an effective excuse for imposing an inadvertent burden on the support provider and, thus, it can effectively mitigate the interpersonal cost of receipt of support, it is unlikely to mitigate a threat the receipt of support might impose on one's self-efficacy. In other words, the receipt of support, even when confronted with high levels of stressful life events, may still signal a loss of independence and competence. Accordingly, we predicted that the linkage between perceived support and health would be less strongly evident among Americans regardless of their levels of perceived stress.

Third, beyond the influence of cultural norms and life stress, whether social support is beneficial for health may vary depending on individual-level factors. Here, we focused on one particular facet of personality, neuroticism. Evidence is quite strong that neurotic people are attuned to negative emotional information (e.g. Eysenck, 1967; Gray, 1982) because they carry negative interpretive cognitive schemas (e.g. Loo, 1984; Roberts and Kendler, 1999). It would follow, then, that neuroticism would sensitize people to potential costs associated with receipt of social support. We may thus predict that neuroticism will diminish any sustained benefits of support, thereby dampening the strength of the potentially positive relationship between perceived support and health (Karney and Bradbury, 1995). The converse of this logic is that the relationship between perceived support and health would be more positive for those who are relatively low in neuroticism.

For the present analyses, we used a large comparative survey of Japanese and American adults to test the above hypotheses. Our focus was on the statistical association between perceived support and the health status of the recipient of the support. We expected that the link between perceived support and health would be most evident among Japanese adults (from a support-approving cultural context) who reported high life stress (in a support requiring and seeking situation). Moreover, the perceived support–health link would be more positive for those low (vs high) in neuroticism (with a support-accepting personality).

## Methods

### Participants

Demographic, social, psychological, and health data were compared from two linked surveys. From the second wave of the Midlife in the US national study (MIDUS), we surveyed 1054 adults (aged 34–84) who initially had been randomly sampled via phone as part of the full MIDUS sample, and then later volunteered for an additional overnight hospital analysis during which they completed another written questionnaire (representing a 71% retention rate from the first wave). For the parallel study in Japan, randomly selected respondents in the Tokyo metropolitan area within specific age, gender, and city ward categories completed a self-administered questionnaire based on MIDUS that had been translated and back-translated by native speakers. The response rate was 56.2%, yielding a sample of 1027 adults (aged 30–79). The means and standard deviations (in parentheses) for three of our demographic variables were (listing Japanese results first): (1) Age – 54 (14), 55 (12) years; (2) Gender – female 51% (.5), 55% (.5); (3) Marital status – married 69% (.45), 72% (.45). The mean level of educational attainment was at least one year of college (no degree) in Japan, and a two-year college or vocational degree in the US.

## Measures

To assess perceived receipt of social support (e.g. caring, appreciation), participants reported the extent to which they received emotional support from their spouse or partner (six items), other family members (four items), and friends (four items) ( $\alpha$ s = .86 and .88, for Japanese and Americans, respectively; Schuster et al., 1990; Walen and Lachman, 2000). For example, participants were asked to indicate how much their friends (family or spouse) really care about them or understand the way they feel about things. Perceived stress was assessed by the 10-item Perceived Stress Scale (PSS, Cohen et al., 1983;  $\alpha$ s = .76 and .86). Participants rated the degree to which they experienced various forms of stress during the last month. Physical health was assessed by scoring the number of chronic health problems respondents experienced in the past 12 months (maximum of 30, e.g. diabetes). We also assessed perceived health by averaging three mutually correlated self-ratings of current health, future health, and control over health ( $\alpha$ s = .79 and .69). Neuroticism was assessed by self-ratings of four pertinent personality traits: moody, worrying, nervous, and calm (reverse-coded). Participants rated how much each of the adjectives describes them (1 = *not at all*, 4 = *a lot*) (Rossi, 2001;  $\alpha$ s = .51 and .76). Although the reliability for Japanese is rather low ( $\alpha$  = .51), it is likely due to the small number of items used to assess this construct (Schmitt, 1996). Descriptive statistics and intercorrelations for our key variables are summarized in Table 1.

In addition, several variables that could potentially confound the support–health linkage were controlled. Subjective social class was controlled because middle (vs working) class people are more likely to receive support and, simultaneously, they are also likely to be healthier for economic and instrumental reasons that have less to do with support. Subjective social class standing was measured by asking participants to rank their relative standing in the community by placing themselves on a ladder with respect to where they feel they stand (1 = *lowest*, 10 = *highest*, Goodman et al., 2001), as well as to rate the extent to which they feel they have enough money to meet their needs (1 = *not enough*, 3 = *more than enough*). The ratings from these two measures were standardized and averaged within each culture. We also controlled for self-sufficiency (Lachman and Weaver, 1997;  $\alpha$ s = .44 and .67), optimism (Scheier and Carver, 1985;  $\alpha$ s = .58 and .67), and self-esteem (Rosenberg, 1965;  $\alpha$ s = .66 and .78), because these variables are likely to be positively associated with both perceived support and health. To further sharpen our analysis on neuroticism, we controlled for the remaining four of the Big Five personality traits (Rossi, 2001; extraversion,  $\alpha$ s = .83 and .78, conscientiousness,  $\alpha$ s = .57 and .61, agreeableness,  $\alpha$ s = .87 and .82, openness to experience,  $\alpha$ s = .84 and .77).

## Results

Focusing on three potential moderators of the link between perceived support and health, we formulated four specific predictions. First, we predicted that the association between perceived support and health would be greater for Japanese than for Americans. Second, however, the benefits Japanese would obtain from perceived support were expected to be greater when they were under stress (i.e., when the receipt of support was justified). The support–health association was thus predicted to be especially strong for Japanese under stress. Third, we predicted that there would be no such effect of stress for Americans. In combination, the first three predictions imply an interaction among culture, support, and stress. Fourth, we also anticipated that the positive support–health association predicted for Japanese would be especially pronounced for those who were low in neuroticism. This prediction implies an interaction among culture, support, and neuroticism.

A step-wise regression was performed on the reported number of chronic health problems. In Step 1, we entered demographic variables (age, gender, subjective social class), as well as

the control personality variables (extraversion, conscientiousness, openness to experience, agreeableness, self-sufficiency, optimism, and self-esteem). In Step 2, four variables germane to our hypotheses and questions, that is, social support, neuroticism, culture, and perceived stress, were entered. Steps 3 and 4 involved all two-way interactions and all three-way interactions among these variables, respectively. In Step 5, we entered the four-way interaction among them. To address potential statistical issues of multicollinearity, centered scores were used to compute interaction terms (Cohen and Cohen, 1983; Cronbach, 1987). Table 2 summarizes findings from the regression.

As predicted, the Support  $\times$  Stress  $\times$  Culture interaction proved to be significant,  $b = .10$ ,  $t(1989) = 2.84$ ,  $p < .005$ . As illustrated in Fig. 1, the link between perceived support and the number of chronic health problems was significantly negative only for Japanese who reported being under a lot of stress,  $b = -.45$ ,  $t(969) = -2.58$ ,  $p < .01$ . This association was less evident for Japanese who were not as stressed,  $b = .25$ ,  $t(969) = 1.30$ , *ns*. The Support  $\times$  Stress interaction was significant for Japanese,  $b = -.06$ ,  $t(969) = -2.89$ ,  $p < .005$ . Among Americans, however, the link between perceived support and health was negligible regardless of stress,  $t(1018) < 1$ . The Support  $\times$  Stress interaction was statistically trivial for Americans,  $t < 1$ .

Second, the predicted interaction among culture, support, and neuroticism did not reach statistical significance,  $b = .35$ ,  $t(1989) = 1.23$ ,  $p > .21$ . However, the four-way interaction involving support, stress, culture, and neuroticism approached statistical significance,  $b = -.09$ ,  $t(1989) = -1.83$ ,  $p < .07$ . As can be seen in Table 3, this four-way interaction resulted from the fact that the Support  $\times$  Stress  $\times$  Culture interaction shown in Fig. 1 was significant only for low-neuroticism individuals,  $b = .14$ ,  $t(1135) = 3.18$ ,  $p < .005$ . The support–health link was not significant for either their high-neuroticism counterparts or Americans. The American result did not depend on stress levels or degrees of neuroticism.

We also analyzed the self-assessed health index and found a pattern that corresponded closely to the results for the number of chronic health problems (see Table 1). The four-way interaction was significant,  $b = .03$ ,  $t(2002) = 1.94$ ,  $p = .05$ . As shown in Table 3, the link between perceived support and self-assessed health was generally negligible, except for the low-neuroticism Japanese who reported relatively high levels of stress,  $b = .28$ ,  $t(522) = 2.94$ ,  $p < .005$ . This pattern of results replicated the pattern determined for the measure of chronic health conditions.

## Discussion

The novel finding here is that perceived support emerged as most beneficial in the context of both support-approving cultural norms (interdependence) and support-requiring situational factors (stressful events). Moreover, this effect appeared to be especially strong for those who have support-accepting personal styles (free from negativism of neuroticism).

Future work should explore the generality of this four-way interaction we identified. For example, it would be important to replicate the current findings in other independent and interdependent cultures (e.g. Western Europeans vs Koreans). Above and beyond this, it will also be informative to examine whether the association between perceived support and health might be modulated by individual differences in independence or interdependence within each culture. Will even Americans show health benefits of perceived support if they are highly interdependent or, conversely, will even Asians show little or no effect of perceived support if they are highly independent?

One limitation of the current study is that it was correlational, which made it impossible to establish causality. However, we controlled for a number of the confounding variables that

could produce spurious correlations between perceived support and health. Moreover, our finding is less likely to reflect reverse causality, since healthy people are unlikely to solicit more support from their close companions and care providers than do unhealthy people. We may thus rule out an a priori causal link from health status to support as the reason for *positive* associations between support and health. Conversely, one could plausibly argue that support in fact has a causal impact on health, at least for low-neuroticism Japanese who feel they are living with sustained stress.

Nevertheless, in order to establish causality, the present work may be usefully supplemented by studies with experimental manipulations of both support and cultural values. For example, future research should examine whether recall of past experiences of having received support might differentially increase subjective well-being of individuals as a function of priming of independence or interdependence. We expect that the recall of previous support experience would increase subjective well-being more if interdependence was primed than if independence was primed.

The pattern we found for low-neuroticism Japanese is reminiscent of the classic buffering hypothesis for social support, which holds that social support mitigates negative health consequences of stress (Cohen, 1992; Lakey and Orehek, 2011). The fact that a clearer pattern emerged for the Japanese, as anticipated by our initial hypotheses (illustrated in Fig. 1 and Table 1) – at least among those with low propensities toward neuroticism – but *not* for Americans, might suggest that the buffering hypothesis is even more valid in interdependent, rather than independent, cultural contexts.

We should hasten to add that the buffering effect of social support on health surely does occur under certain circumstances for Americans. Evidence suggests that the primary emotional cost of perceived support for Americans is a threat to the positive evaluation of the self as independent and self-efficacious (Bolger and Amarel, 2007). Hence, the buffering effect might be more evident with implicit, rather than explicit support. Likewise, it might also occur if the support highlights one's accomplishment (e.g. reminding both self and others of various stresses associated with a high-profile job), rather than pointing to one's weaknesses. Cross-cultural research along this line will help us develop more efficacious, sensitive, and value-specific interventions to improve the health status of individuals living in varying life circumstances in different cultures and countries.

We started this article by referring to the body of literature that demonstrates substantial health benefits of social integration (Cohen, 1992; Kafetsios and Sideridis, 2006; O'Donovan and Hughes, 2008; Wills, 1991). To conclude this article, then, we wish to anchor the current finding to this broader literature. The general conclusion that the link between perceived support (the perception that one has received support) and health is elusive (Bolger and Amarel, 2007) would seem rather surprising and even paradoxical because perceived social support is such a face-valid, prima-facie indicator of social integration. The current work suggests, however, that perceived social support is a double-edged sword. It offers a much-needed assurance of social integration, while at the same time it entails a variety of emotional costs. Like an insurance policy, then, social support may be most beneficial, enabling one to achieve the peace of mind while living an active life, thereby promoting health and well-being, when one has it available at hand without drawing on it.

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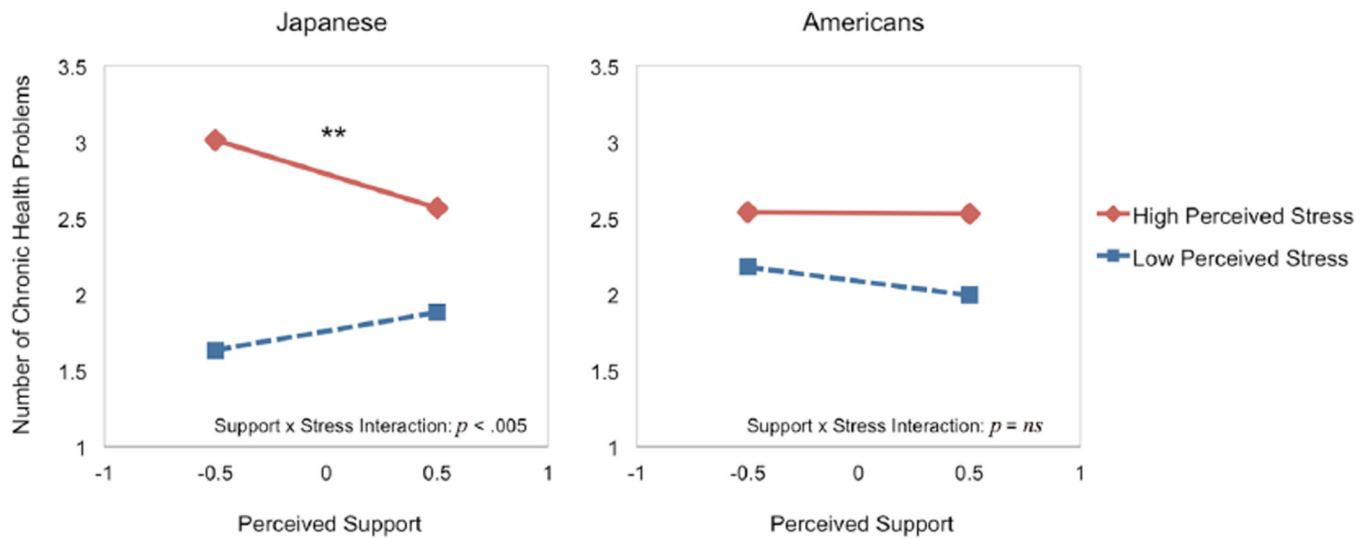
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**Figure 1.** The three-way interaction between Support  $\times$  Stress  $\times$  Culture with respect to the influence on number of chronic health problems. The link between receipt of support and chronic health problems was significant only for Japanese who report being under high stress. Note: \*\* $p < .01$ .

Table 1

Descriptive statistics and intercorrelations for key variables

Japanese		<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Perceived support	1025	2.62	0.50	-	-0.15***	-0.12***	-0.08***	0.24***	
2. Perceived stress	936	4.37	0.78	-	0.21***	0.22***	-0.15***		
3. Neuroticism	1023	2.11	0.56	-	-	0.18***	-0.23***		
4. Number of chronic health problems	1012	2.30	1.99	-	-	-	-0.29***		
5. Self-assessed health	1027	5.78	1.66	-	-	-	-		
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Americans		<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Perceived support	1052	3.48	0.46	-	-0.21***	-0.24***	-0.10***	0.22***	
2. Perceived stress	1054	4.92	1.10	-	0.12***	0.15***	-0.09***		
3. Neuroticism	1050	2.03	0.63	-	-	0.22***	-0.25***		
4. Number of chronic health problems	1054	2.30	2.34	-	-	-	-0.44***		
5. Self-assessed health	1054	7.49	1.40	-	-	-	-		

*Note.*\*  $p < .05$ ,\*\*  $p < .01$ ,\*\*\*  $p < .001$ .

Unstandardized regression coefficients in predicting number of chronic health problems and self-assessment measure of health as a function of culture, perceived support, perceived stress, and neuroticism

**Table 2**

Predictors	Number of Chronic Health Problems			Self-Assessed Health		
	Beta	t-test	R <sup>2</sup> increase	Beta	t-test	R <sup>2</sup> increase
Gender	0.250	5.271***	0.569****	0.032	2.074*	0.340****
Age	0.034	9.054***		-0.005	-4.158***	
Subjective social class	-0.200	-3.058***		0.072	3.386***	
Extraversion	-0.043	-0.409		0.072	2.104*	
Openness to experience	0.318	2.990***		0.015	0.419	
Conscientiousness	-0.097	-0.888		0.136	3.845***	
Agreeableness	0.228	2.048*		-0.027	-0.739	
Optimism	-0.054	-2.229*		0.019	2.468*	
Self-sufficiency	-0.035	-0.583		0.022	1.119	
Self-esteem	-0.017	-1.776†		0.011	3.582***	
Culture	0.211	1.341	0.016****	0.401	7.854***	0.043****
Perceived support	0.008	0.052		0.136	2.684**	
Perceived stress	0.061	4.414***		-0.026	-5.920***	
Neuroticism	0.372	2.511*		-0.095	-1.986*	
Culture × Perceived support	-0.017	-0.078	0.001	-0.125	-1.763†	0.004†
Culture × Perceived stress	-0.034	-1.883†		0.009	1.498	
Culture × Neuroticism	0.114	0.594		0.065	1.049	
Perceived support × Perceived stress	-0.065	-2.792***		0.012	1.637	
Perceived support × Neuroticism	0.349	1.258		-0.093	-1.034	
Perceived stress × Neuroticism	0.029	1.570		-0.007	-1.136	
Culture × Perceived support × Perceived stress	0.096	2.841***	0.002*	-0.014	-1.295	0.001
Culture × Perceived support × Neuroticism	-0.639	-1.760†		0.138	1.168	
Culture × Perceived stress × Neuroticism	-0.041	-1.679†		0.013	1.600	

Predictors	Number of Chronic Health Problems			Self-Assessed Health		
	Beta	t-test	R <sup>2</sup> increase	Beta	t-test	R <sup>2</sup> increase
Perceived support × Perceived stress × Neuroticism	0.014	0.392		-0.012	-1.052	
Culture × Perceived support × Perceived stress × Neuroticism	-0.085	-1.825 <sup>†</sup>	0.001 <sup>†</sup>	0.029	1.937 <sup>*</sup>	0.001 <sup>*</sup>

Note.

<sup>†</sup>  $p < .10$ ,

\*  $p < .05$ ,

\*\*  $p < .01$ ,

\*\*\*  $p < .001$

**Table 3**

Untandardized regression coefficients used to predict health status as a function of perceived receipt of social support as a function of neuroticism, culture, and perceived stress

	Japanese		Americans	
	High Stress	Low Stress	High Stress	Low Stress
Number of chronic health problems	High neuroticism	0.31	0.02	0.13
	Low neuroticism	-0.66***	0.12	-0.66†
Self-assessed health	High neuroticism	0.14	0.05	-0.01
	Low neuroticism	0.28***	-0.01	0.07

Note.

†  $p < .10$ ,

\*\*\*  $p < .001$ .