Sustainable Behavior, Perceived Globalization Impact, World-Mindedness, Identity, and Perceived Risk in College Samples from the United States, China, and Taiwan

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Abstract

This study identified psychological predictors of environmentally sustainable behavior in college student samples from the United States (N = 442), China (N = 516), and Taiwan (N = 164) based on the literature and informed by an extension of Sherif's superordinate goal theory, which stipulates that perceived generalized threat is associated with increased community solidarity, promotes cooperative behavior, and fosters a stronger sense of belonging to a group. Predictor variables that were studied included (a) perceived impact of globalization in general and in own country, (b) global and national belonging, (c) world-minded value orientation, and (d) perceived personal environmental risk. Data were collected during the spring and summer of 2012 using the Qualtrics online survey platform. Perceived personal environmental risk and global belonging were significant predictors of sustainable behavior in all three samples. World-mindedness and national belonging were additional significant predictors in the US and Chinese samples. Global belonging and perceived environmental risk were positively correlated in all three samples. In all three samples, a stronger sense of global belonging

was related to stronger perception of the positive impact of globalization in general and locally. In all three samples, those who scored higher on both global and national belonging (based on median split method) scored significantly higher on sustainable behavior than those who scored lower on both. Results are discussed in terms of Sherif's superordinate goal theory and potential etic constructs that may be culture common and implications for education and community engagement. Key Words: Sustainable behavior—Global identity—National identity—World-mindedness—Perceived environmental risk.

The 2014 report of the International Panel on Climate Change (Climate Change, 2014) has generated an urgency regarding the long-recognized implications of climate change as well as the need to prepare for its consequences and act more vigorously to promote sustainable behavior worldwide. In an increasingly globalized world, environmental threats and actions to deal with them take on global proportions and transcend national boundaries.

While the material impact of industrialization and globalization on sustainability and the environment has been well documented (e.g., Jorgenson & Kick, 2006; Millennium Ecosystem Assessment, 2013; Rees, 2002), the relationship between sustainable behavior and how globalization is subjectively experienced and perceived has been relatively overlooked. On the one hand, the discourse on globalization has generally addressed issues that juxtapose negative and positive economic impacts of globalization with a focus on increasing inequalities in developing countries (e.g., Milanovic, 2005; Navarro, 2007). On the other hand, it has tried to address the interface between

global economic pressures and the role of governments to uphold national economic interests (e.g., Brune & Garrett, 2005; Storper, 1997; Weiss, 2003). This tension is often couched in the larger context of the tension between the “global” and the “local,” or the interpenetration of the “universal” and the “particular” (e.g., Appadurai, 1996; Cox, 1997; Hannerz, 1991; Robertson & Khondker, 1998).

The study and analyses of the tensions created by globalization have gone beyond its economic implications and have begun to address an increasing range of issues such as health and well-being (e.g., Lemert & Elliot, 2006; Mukherjee & Kriekhaus, 2011; Tsai, 2007), social transformation and cultural interpenetration (e.g., Cowen, 2002; Fu & Chi-Yue, 2007; Yan et al., 2011), local and global identities (e.g., Arnett, 2002; Banerjee, 2008; Der-Karabetian & Balian, 1992; Shih, 2008; Westjohn et al., 2009, 2012), values (e.g., Der-Karabetian, 1992; Mayton & Lerandau, 1996; Shepherd et al., 2009), and environmental sustainability (e.g., Der-Karabetian et al., 1996; Jorgenson & Kick, 2006; Rees, 2002). While the effect of technology that demands increasing utilization of fossil fuels should be recognized, the problem essentially arises from human behavior involving psychological factors (e.g., Veldman, 2012; Winter, 1996). For instance, Shepherd et al. (2009) suggest that to promote sustainable development the gap between attitudes and behavior should be closed, and values found within different cultures may be leveraged to reinforce and promote environmentally sustainable behavior. Moreover, Werff, Steg, and Keizer (2013) have found that to influence proenvironmental choices and behaviors, values need to be linked to self-identity and how it is impacted by globalization.

Globalization has impacted identity development in ways that have contributed to the emergence of identities that blend the local, national, and global (Elliott & Lemert, 2005). Terms that describe the emerging identities include “hybridity” (Kraidy, 2005), “glocal identity” (Strizhakova et al., 2011), “amalgamated identities” (Banerjee, 2008), “international identity” (Arrow & Sundberg, 2004), and “global-human identity” (Der-Karabetian & Balian, 1992). While it is quite well established that environmental risk perception is associated with proenvironmental behavior and policy support (e.g., Der-Karabetian et al., 1996; Fleury-Bahi, 2008; Leiserowitz, 2006; Ojala, 2005; Zahran et al., 2012), how local, national, or global identities interact with environmental risk perception and activism is understudied. Reysen and Katzarska-Miller (2012) have shown that sense of global citizenship and identity and interconnectedness with others predicted belief in environmental sustainability and other prosocial values such as social justice, intergroup helping, and valuing of diversity.

Besides local and global identities, the value orientation of global citizenship and world-mindedness has been implicated in enhancing

environmentally responsible attitudes and behavior in general (e.g., Der-Karabetian et al., 1996; Stern et al., 1993; Winter, 1996) as well as in specific contexts of consumer preferences of environmentally friendly products and in ethical business practices locally and globally (e.g., Nijssen & Douglas, 2008; Rawwas et al., 1996; Sener & Hazer, 2008). Moreover, several theoretical models and perspectives have also identified the role personal and universal values play in promoting sustainable behavior (Arbutnott, 2009; Juarez-Najera et al., 2010; Leiserowitz et al., 2006; Mayton & Lerandau, 1996; Milbrath, 1989).

Thus, as suggested by the literature, the psychological variables examined in this study included perceived positive-negative impact of globalization generally and locally, sense of global and national identity, world-minded value orientation, and perceived personal environmental risk. We have chosen to examine the relationship among these variables in college student samples from the United States, China, and Taiwan. These samples were convenient choices because of our access to and the availability of target populations. These samples come from countries that are experiencing challenges of pollution and environmental degradation (including air quality issues in China, water pollution issues in Taiwan, and energy and water conservation issues in the United States) and are trying to find ways of dealing with these challenges. For instance, in Taiwan, which ranks 22nd worldwide in greenhouse gas emissions, Lin (2013) has found that proenvironmental behavior is significantly related to psychological factors of perceived control and attitudes toward global warming. In China, as reported by Liu and Leiserowitz (2009), there is an increasing effort to understand and address environmental degradation issues with an emphasis on setting and enforcing rules for sustainable behavior in rural and urban areas. In the United States, there is an ongoing debate between the public and the private sectors about the proper management of water and energy resources (e.g., Hall et al., 2005) as well as understanding optimum approaches to conservation behavior (e.g., Reiss & White, 2008).

One theoretical perspective that pulls these psychological variables together and helps make predictions is an extension of Sherif's (1966) superordinate goal theory. This perspective in essence stipulates that the presence of perceived generalized threat and the desire to eliminate it encourages cooperative tendencies, promotes sense of group solidarity, reinforces stronger identification with the community, and invokes altruistic value orientation. In the context of this theoretical perspective, perceived negative globalization impact and environmental risk may be considered a generalized threat transcending national boundaries. And the desire to reduce and eliminate the threat by engaging in sustainable behavior may be taken as a superordinate goal involving those affected by the threat. The sense of global identity and

citizenship, and world-minded value orientation, would reflect a sense of solidarity with and belonging to the global and local communities that are experiencing the generalized threat from environmental degradation and climate change. This extension of the superordinate goal theory has found support in a number of studies dealing with anti-nuclear activism. For instance, world-minded value orientation and perceived nuclear threat have been correlated positively with higher anti-nuclear activism (Kosterman & Feshbach, 1989), favorable attitude toward disarmament (Rigby et al., 1990), anti-nuclear activism (Der-Karabetian, 1992), and nuclear anxiety (Dyal et al., 1990). Similarly, studies in multiple countries have shown relationships between perceived environmental risk (generalized threat) and pro-environmental activism (e.g., Der-Karabetian et al., 1996; Leiserowitz, 2006; Zahran et al., 2006), and global citizenship and world-minded value orientation (Der-Karabetian et al., 1996; Stern et al., 1993).

Thus, based on the extension of the superordinate goal theory and psychological factors identified in the literature, it is hypothesized that in the three samples from the United States, China, and Taiwan higher self-reported sustainable behavior will be predicted by (1) more negative perceived impact of globalization, locally and globally, (2) greater perception of personal environmental risk, (3) stronger world-minded value orientation, (4) stronger sense of identification with the global community, and (5) stronger sense of national identity. Moreover, for exploratory purposes, differences between countries and relationships among world-mindedness, global and national identity, and perceived global impact are examined.

The superordinate goal theory presumes that factors that may contribute to sustainable behavior may have culture-bound as well as culture-common elements that are etic in nature (Pike, 1966) that transcend cultural boundaries. Literature tends to support such a contention (e.g., Der-Karabetian, 1992; Der-Karabetian et al., 1994, 1996; Dyal et al., 1990; Leiserowitz, 2006). The predictive model we examine in this study may yield both culture-common and culture-specific elements. Additionally, comparing the three country samples on the variables under study may reveal culture-bound factors that differentiate the samples. One would be hard pressed to make specific predictions regarding differences between the three samples on each of the variables, since that would require a serious discussion of geopolitical, historical, sociological, and economic issues that is beyond the scope of this study.

Method

Participants

Participants in the three samples were college students born and currently residing in the United States ($N = 442$), China ($N = 516$), and Taiwan ($N = 164$). Table 1 shows the demographic profiles of the three

Table 1. Demographic Information for the US, Chinese, and Taiwanese Samples of College Students Living in Their Country of Birth

	UNITED STATES ($N = 442$) <i>M</i> OR %	CHINA ($N = 516$) <i>M</i> OR %	TAIWAN ($N = 164$) <i>M</i> OR %
Age			
	$M = 21.9$	$M = 23.8$	$M = 23.2$
	(Range = 17–58)	(Range = 18–45)	(Range = 16–38)
Sex			
Male	39	51	48
Female	61	49	52
Years in college			
4 or fewer years	93	81	93
5 or more years	7	19	7
Traveled outside own country			
No	19	73	18
Yes	81	27	82
Times communicated with people outside own country last week			
None	44	53	33
1 or 2 times	30	27	32
3 or more times	26	20	35
Politically active to influence local or national decisions			
Not at all	47	72	71
Somewhat	38	21	19
Active/very active	15	7	10
Within the last year, how many times have you done volunteer (unpaid) work for a proenvironmental organization?			
None	48	49	72
1–2 times	32	41	23
3 or more times	21	10	5

samples. The mean ages of the three samples were comparable: 21.9 for the United States, 23.8 for China, and 23.2 for Taiwan. There were somewhat more women than men in the US sample, but women and men were more evenly distributed in the Chinese and Taiwanese samples. Nearly three times more respondents in the US and Taiwanese samples than in the Chinese sample had traveled outside their country. However, the frequency of times communicating with people outside their country was more evenly distributed within the three samples. Notably fewer respondents in the Chinese and Taiwanese samples reported being politically active compared to the US sample. Relatively fewer respondents in the Taiwanese sample than the Chinese and US samples reported doing volunteer work for a proenvironmental organization.

Measures

All measures were rated on a 6-point Likert scale: 1 = *Disagree Strongly*, 2 = *Disagree*, 3 = *Disagree Somewhat*, 4 = *Agree Somewhat*, 5 = *Agree*, 6 = *Agree Strongly*. The scores on each of the measures were the average ratings across items. All the items of the measures can be found in the Appendix.

Globalization General Impact (GGI). The Globalization General Impact measure was developed especially for this study based on issues identified in the literature (e.g., Bartelson, 2009; Brown, 2008; Martens & Raza, 2010; Pies et al., 2010; Rees, 2002; Robertson, 1995; Spruyt, 2002; Tsai, 2007). The authors compiled an initial pool of 25 items that dealt with negative and positive consequences of globalization. Two faculty members judged the goodness of each item independently; one faculty member was an economist, and the other was an environmental biologist. Faculty judges agreed that 12 of the items were good for assessing globalization's general impact. These items composed the measure. Examples include "Globalization contributes to better economic conditions for everyone" and "Globalization of consumer markets has contributed to global environmental problems such as global warming, loss of biodiversity, and deforestation." Responses to four of the items were reversed. Higher scores indicate more positive impact of globalization. The Cronbach's alpha coefficients of internal consistency were .75, .75, and .76 for the US, Chinese, and Taiwanese samples, respectively, suggesting good reliability across country samples (alpha values for all the measures with 95% confidence intervals are presented in Table 3). No prior analyses of criterion or construct validity were conducted. However, the item selection process provides good indication of face and content validity. The findings in this study may further provide evidence of its validity by virtue of its relationship to other variables.

At the top of this section of the survey, the term "globalization" was defined as follows:

The term "Globalization" refers to the increasing interdependence of countries and cultures involving mutual influences of economic interests and political systems, as well as to the growing exchange of cultural traditions, artistic creativity, scientific advances, and technological innovations between countries and cultures.

Globalization Impact on Own Country (IOC). In the initial pool of 25 globalization-impact items, faculty judges agreed that there were eight good items that dealt with globalization's impact on own country. These items composed the measure. Examples include "Globalization has impacted the economy of my country positively by raising the standard of living" and "Globalization has damaged the natural environment of my country." Responses to three of the items were reversed. Higher scores indicate more positive impact of globalization. The Cronbach's alpha coefficients of internal consistency were .70, .69, and .58 for the US, Chinese, and Taiwanese samples, respectively, suggesting acceptable reliability for research purposes. No prior analyses of validity were conducted. However, the item selection process provides good indication of face and content validity, and the findings in this study may further provide evidence of its validity.

National Belonging (NB). National belonging was measured using a modified version of a measure developed by Der-Karabetian and Ruiz (1997), which was partially derived from Zak (1973). It included seven items where no names of any particular country were used; instead, the expressions "my country" or "in my country" were used. Examples include "Being a citizen in my country plays an important role in my life" and "If I were to be born all over again, I would wish to be born in my country." This measure in its original form (Zak, 1973) or in somewhat modified or adapted form has been used with multiple student groups, including two Midwestern American student samples (Westjohn et al., 2012), Armenian Americans from California (Der-Karabetian, 1980), Jewish Americans from New York (Zak, 1973), Mexican Americans from California (Der-Karabetian & Rodriguez, 1990; Der-Karabetian & Ruiz, 1997), California students from different ethnic backgrounds (Der-Karabetian & Rosen, 1990), and a cross section of Turkish Armenians (Der-Karabetian & Balian, 1992). In nearly all these studies, the measure has shown good internal consistency, and predictable differences between groups and correlations with different criterion variables were demonstrated,

suggesting good criterion validity and cross-cultural viability. In the current study, the Cronbach's alpha coefficients of internal consistency were .79, .81, and .81 for the US, Chinese, and Taiwanese samples, respectively, suggesting good reliability across country samples. No items were reverse-scored in this measure, and higher scores indicate stronger national belonging and identity.

Global Belonging (GB). Global belonging was measured using a modified version of a measure developed by Der-Karabetian and Ruiz (1997), which was partially derived from Zak (1973). It was composed of seven items. Examples include "I think of myself as a citizen of the world" and "I feel that I am related to everyone in the world as if they were my family." This measure in somewhat modified or adapted form has been used with multiple student groups and samples from different countries including Hong Kong adolescents (Delwiche, 2004), a cross section of Midwestern American students and non-students (Westjohn et al., 2009), a cross section of students and non-students from southeast China (Westjohn et al., 2009), a cross section of Turkish Armenians (Der-Karabetian & Balian, 1992), Mexican American students from California (Der-Karabetian & Rodriguez, 1990; Der-Karabetian & Ruiz, 1997), two Midwestern American student samples (Westjohn et al., 2012), and California students from different ethnic backgrounds (Der-Karabetian & Rosen, 1990). In nearly all these studies, the measure has shown good internal consistency and predictable differences between groups, as well as correlations with different criterion measures, suggesting good construct and criterion validity, and cross-cultural viability. In the current study, the Cronbach's alpha coefficients of internal consistency were .82, .87, and .84 for the US, Chinese and Taiwanese samples, respectively, suggesting good reliability. No items were reverse-scored in this measure, and higher scores indicate stronger global belonging.

World-Mindedness (WM). World-mindedness as a value orientation was measured using the Cross-Cultural World-Mindedness scale developed by Der-Karabetian (1992). The measure is composed of 26 items based on earlier measures developed by Sampson and Smith (1957) and Silvernail (1979) and has been used successfully in 13 countries by Der-Karabetian (1992) and Der-Karabetian, Mangarai, Uvias, and Watanabe (1994): The countries were Australia, England, Greece, India, Japan, Mexico, Nigeria, South Africa, Spain, Sri Lanka, Sweden, Taiwan, and the United States. Examples of the items include "It would be better to be a citizen of the world than of any particular country" and "The rich nations should share their wealth with the less fortunate people of the world." This measure has also

demonstrated good criterion validity in terms of predictable differences between groups, such as differences between political parties (Der-Karabetian & Metzger, 1993; Der-Karabetian & Rice, 1995). It has also been predictably correlated with criterion variables such as anti-nuclear activism in more than a dozen countries (Der-Karabetian, 1992; Der-Karabetian et al., 1994; Rigby et al., 1990), proenvironmental behavior and environmental risk perception (Der-Karabetian et al., 1996), religious orientation (Der-Karabetian & Sides, 1994), sociopolitical locus of control (Der-Karabetian & Precht, 1995), value types of universalism, security, and power (Mayton & Lerandau, 1996), ethnocentrism (Trujillo & Der-Karabetian, 1996), and global identity (Delwiche, 2004).

Taken together, these studies demonstrate strong criterion and construct validity and cross-cultural viability for the measure of World-Mindedness. In the current study, the Cronbach's alpha coefficients were .86, .90, and .87 for the US, Chinese, and Taiwanese samples, respectively, suggesting excellent reliability across the three country samples. Responses to 13 of the items were reversed. Higher scores indicate stronger world-minded value orientation.

Sustainable Behavior (SB). Self-reported sustainable behavior was measured using items generated based on themes and issues identified in the literature (e.g., Borghesi & Vercelli, 2003; de Haan, 2000; Der-Karabetian et al., 1996; Maloney et al., 1975; Rees, 2002; Roberts, 1996). The measure includes six items addressing conservation, consumption, and recycling activities. Examples include "I try to save water and electricity as much as I can" and "I tend to purchase environmentally friendly products rather than buy cheap environmentally unfriendly alternatives." No items were reverse-scored. High scores indicate more self-reported environmentally sustainable behavior. The item selection process suggests good face and content validity for sustainable behavior, and the findings in this study may further provide evidence of its validity. The Cronbach's alpha coefficients of internal consistency were .75, .78, and .76 for the US, Chinese, and Taiwanese samples, respectively, suggesting good reliability.

Personal Environmental Risk (PER). Personal environmental risk was measured using a modified version of a measure developed by Der-Karabetian et al. (1996). The measure used in this study included 5 of the 15 original items, taking into consideration length of the survey and relevance of the items across the three samples. The items address likelihood of health hazards to oneself or family because of environmental degradation and depletion of natural resources like water and energy. Examples include "It is likely that I will develop

skin cancer as a result of ozone depletion” and “It is likely that during my lifetime my family and I might experience serious water shortage, limiting use per household.” The original measure has been used with college students from the United States and Britain (Der-Karabetian et al., 1966), Greece (Der-Karabetian & Rice, 1995), and Argentina (Der-Karabetian & Rodriques, 2002). In these studies, the measure was predictably correlated with world-mindedness, proenvironmental activism, and individualism-collectivism, suggesting good criterion validity. No item ratings were reversed in the current form. Higher scores indicate perceptions of greater personal environmental risk. Cronbach’s alpha coefficients of internal consistency were .85, .80, and .89 for the US, Chinese, and Taiwanese samples, respectively, suggesting strong reliability.

Procedure

A snowball sampling method was used to collect the data between January and June 2012 using the Qualtrics online survey platform. About 50 US and 50 international students from China and Taiwan, enrolled in three courses in a medium-sized university in California, were asked to send the link to their friends and to social media friends in their countries who were college students, as well as to ask them in turn to send the link to their friends. The US students were also asked to complete the survey themselves. The Chinese sample completed the Simple Chinese version, and the Taiwanese sample completed the Traditional Chinese version. Back translation was used to translate

the surveys. The US sample came primarily from California. No incentives were provided. Participants had to electronically agree to participate in the study after reading a consent form. A link to a Web site was provided in the consent form, where a summary of the results would be available for viewing for those who were interested.

About 25% of the respondents started but did not finish the survey (which is not uncommon for online surveys) and were excluded. Cases that had missing responses on more than 10% of the items in any one of the measures were excluded as well. For the rest, missing values were replaced by the means of their respective measures. Institutional Review Board approval was obtained before launching the survey. It should be mentioned that these were convenience samples and do not necessarily represent students in their respective countries, thus limiting the generalizability of the findings.

Results

Before conducting standard multiple regression analyses to determine the predictors of sustainable behavior, sample means on the different measures were compared (Table 2), and the measures were correlated within each sample (Table 3).

Mean Differences. There were significant differences between the samples on all the measures except on Globalization General Impact. The effect sizes ranged between small and medium (.023 to .106). LSD was used for post hoc pair-wise comparisons at $p < .05$. While the

Table 2. Means, Standard Deviations, *F* Values (One-Way ANOVA) and Pair-Wise Comparisons (LSD) of the US, Chinese, and Taiwanese Samples on Different Measures

SCALE	UNITED STATES (<i>N</i> = 442)		CHINA (<i>N</i> = 516)		TAIWAN (<i>N</i> = 164)		<i>F</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
GGI	3.67 ^{a,b}	0.33	3.71 ^{a,c}	0.37	3.65 ^{b,c}	0.34	1.40	.242	—
IOC	3.59 ^{a,b}	0.58	3.66 ^a	0.48	3.53 ^b	0.50	15.24	.000	.035
NB	4.53 ^a	0.81	4.61	0.82	4.52 ^a	0.80	10.22	.000	.023
GB	3.87	0.96	4.08	0.93	4.37	0.77	18.81	.000	.043
WM	3.76 ^a	0.56	3.80 ^a	0.44	3.97	0.47	14.20	.000	.037
SB	4.44	0.82	4.78 ^c	0.68	4.67 ^c	0.66	43.32	.000	.098
PER	3.99	1.02	4.49	0.83	4.83	0.84	48.19	.000	.106

Note. GGI = Globalization General Impact; IOC = Impact on Own Country; NB = National Belonging; GB = Global Belonging; WM = World-Mindedness; SB = Sustainable Behavior; PER = Personal Environmental Risk.

^{a,b,c}Shared letters indicate no significant differences (LSD used for pair-wise comparisons at $p < .05$).

Table 3. Intercorrelation (Pearson's r) of Different Measures and Cronbach's Alphas for the US, Chinese, and Taiwanese Samples of College Students

	SB	GGI	IOC	NB	GB	WM	α	95% CI	# ITEMS
US sample ($ns=352 - 442$)									
Sustainable Behavior (SB)	—						.75	.72 to .78	6
Globalization General Impact (GGI)	.08	—					.75	.72 to .78	12
Impact on Own Country (IOC)	.10*	.34***	—				.70	.67 to .73	8
National Belonging (NB)	.12*	.08	.18**	—			.79	.77 to .81	7
Global Belonging (GB)	.37***	.22***	.23**	.20**	—		.82	.80 to .84	7
World-Mindedness (WM)	.31***	-.01	-.01	.31***	.33***	—	.86	.84 to .87	26
Personal Environmental Risk (PER)	.44***	.14**	.04	.01	.39***	.22**	.85	.83 to .87	5
Chinese sample ($ns=389 - 516$)									
Sustainable Behavior (SB)	—						.78	.76 to .80	6
Globalization General Impact (GGI)	.10*	—					.75	.72 to .78	12
Impact on Own Country (IOC)	.14*	.38***	—				.69	.66 to .72	8
National Belonging (NB)	.34***	.16**	.31***	—			.81	.79 to .83	7
Global Belonging (GB)	.27***	.39***	.44***	.48***	—		.87	.86 to .88	7
World-Mindedness (WM)	.31***	-.02	.13*	.11*	.09	—	.90	.89 to .91	26
Personal Environmental Risk (PER)	.44***	.15**	.08	.21***	.29***	.09	.80	.78 to .82	5
Taiwanese sample ($ns=137 - 164$)									
Sustainable Behavior (SB)	—						.76	.71 to .80	6
Globalization General Impact (GGI)	.17*	—					.76	.71 to .80	12
Impact on Own Country (IOC)	.09	.38***	—				.58	.50 to .65	8
National Belonging (NB)	.36***	.18*	.20*	—			.81	.77 to .84	7
Global Belonging (GB)	.44***	.28***	.24**	.57***	—		.84	.81 to .87	7
World-Mindedness (WM)	.33***	-.04	-.02	.23**	.18*	—	.87	.85 to .89	26
Personal Environmental Risk (PER)	.63***	-.01	-.03	.35***	.36***	.32***	.89	.85 to .91	5

* $p < .05$. ** $p < .01$. *** $p < .001$.

three samples tended to perceive the general impact of globalization similarly, the Taiwanese sample rated the impact of globalization on own country less positively than the Chinese sample. US and Chinese samples were not different, $F(2, 1181) = 15.24$, $p < .001$. On the National Belonging measure, the Chinese sample scored significantly lower than the US and the Taiwanese samples, and the latter two were

not different, $F(2, 1180) = 10.22$, $p < .001$. On the Global Belonging measure, all three samples were significantly different from each other, with the Taiwanese sample scoring highest, followed by the Chinese and the US samples, $F(2, 1167) = 18.81$, $p < .001$.

On the World-Mindedness measure, the Taiwanese sample scored significantly higher than the US and Chinese samples, and the latter

two were not different, $F(2, 1006) = 14.20, p < .001$. On the Personal Environmental Risk measure, all three samples were significantly different from each other, with the Taiwanese sample scoring highest, followed by the Chinese then the US samples, $F(2, 1119) = 48.19, p < .001$. On the Sustainable Behavior measure, the US sample scored significantly lower than the Chinese and the Taiwanese samples, and the latter two were not different, $F(2, 1098) = 43.32, p < .001$. These results suggest the differential salience of these variables in the three samples that might reflect culture-bound elements in the constructs involved. To examine how these variables related to each other within each country sample, Pearson correlations were run before running the standard multiple regression analyses.

Intercorrelations of measures. Table 3 presents the intercorrelations of all seven measures for each of the samples, as well as the Cronbach's alpha coefficients of internal consistency with 95% confidence intervals.

In spite of the differential salience of the variables across the country samples, the correlations between the variables appear to be remarkably similar, with some variations, reflecting culture-bound and culture-common relationships between the variables. For instance, looking across the three samples, Personal Environmental Risk had the highest correlation with Sustainable Behavior, followed

by Global Belonging and World-Mindedness; Global Belonging and National Belonging were moderately correlated in the three samples. In all three samples, Globalization General Impact and Impact on Own Country were moderately and positively correlated with each other, and both were correlated with Global Belonging, suggesting the convergent validity of the measures. And both these measures were uncorrelated with World-Mindedness in all three samples (except Impact on Own Country was marginally significant in the Chinese sample, $r = .13, p < .05$), suggesting their discriminant validity. In terms of variations across the three samples, World-Mindedness and Personal Environmental Risk were correlated in the US and Taiwanese samples but not in the Chinese sample. And National Belonging and Personal Environmental Risk were positively correlated in the Chinese and Taiwanese samples but not in the US sample. In order to identify the independent contribution of each of the variables to Sustainable Behavior, a standard multiple regression analysis was conducted for each country sample with Sustainable Behavior as the predicted variable and the remaining six variables as the predictors.

Regression Analysis. Table 4 summarizes the results of the standard multiple regression analysis. In all three samples, the regression models were significant at $p < .001$ levels. The variances explained by

Table 4. Standard Multiple Regression Analyses for US, Chinese, and Taiwanese Samples of College Students Using Sustainable Behavior as the Predicted Variable

	UNITED STATES ($N = 442$)			CHINA ($N = 516$)			TAIWAN ($N = 164$)		
	<i>B</i>	<i>SEB</i>	β	<i>B</i>	<i>SEB</i>	β	<i>B</i>	<i>SEB</i>	β
Globalization General Impact	-.012	.106	-.018	-.074	.094	-.040	.263	.143	.142 [†]
Impact on Own Country	.036	.062	.027	.004	.073	-.003	.080	.105	.059
National Belonging	.134	.045	.139**	.123	.041	.159**	.088	.069	-.009
Global Belonging	.110	.042	.134**	.052	.040	.075	.149	.076	.174*
World-Mindedness	.320	.069	.219***	.370	.067	.255***	.171	.101	.124 [†]
Personal Environmental Risk	.261	.036	.335***	.320	.038	.399***	.394	.061	.499***
R^2 Adj. (% of variance)	.26 (26%)			.32 (32%)			.42 (42%)		
<i>SE</i> of estimate	.68			.54			.50		
<i>F</i> (<i>df</i>)	25.34 (6, 409)			26.92 (6, 329)			15.44 (6, 116)		
<i>p</i>	< .001			< .001			< .001		

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

the models were 26% for the US sample, 32% for the Chinese sample, and 42% for the Taiwanese sample. While there were common predictors of sustainable behavior across the samples, there were also differences. Globalization General Impact was not a predictor in any of the three samples, but it approached significance in the Taiwanese sample. Impact on Own Country was also not a predictor in the three samples, thus failing to support the first hypothesis. Perceived Personal Environmental Risk was the strongest predictor in all three samples, supporting the second hypothesis. World-Mindedness was a predictor for the US and Chinese samples and approached significance in the Taiwanese sample, partially supporting the third hypothesis. Global Belonging was a predictor in the US and Taiwanese samples but not in the Chinese sample, partially supporting the fourth hypothesis. National Belonging was a predictor in the US and Chinese samples but not in the Taiwanese sample, partially supporting the fifth hypothesis. These variations and similarities in the predictors of sustainable behavior in the three country samples further reinforce the culture-bound and culture-common elements associated with sustainable behavior.

Discussion

Personal environmental risk

The findings show that perceived personal environmental risk was the strongest independent predictor of sustainable behavior common in all three samples. Personalizing the environmental risks may add an emotional dimension that could enhance the motivation to act in a proenvironmental manner. This is consistent with findings where anxiety and lack of control tend to be related to perception of environmental risk (Dewberry et al., 1989). This is also in line with the superordinate goal theory, where a generalized threat may lead to action when the consequences are important for personal well-being. It is noteworthy that the Taiwanese sample's mean score was significantly higher than the other two samples' mean scores on this measure, and its standardized beta value was higher than the other samples' beta values. This might suggest the higher salience of environmental concerns in Taiwan.

It is remarkable that this relationship is present in all three of the samples. It points toward a possible etic construct, a relationship that tends to hold across cultures (Pike, 1966; Triandis, 1972). The apparent culture-common or etic nature of the relationship between perceived environmental risk and sustainable behavior is reinforced by other studies in different countries. For instance, the importance of personal risk and well-being as contributing factors to sustainable behavior has been found among college students in the United States and Britain (Der-Karabetian et al., 1996), nationally representative

US samples (Leiserowitz, 2006; Zahran et al., 2006), French adults (Fleury-Bahi, 2008), residents of Kaohsiung, Taiwan (Lin, 2013), and urban adult Chinese (Liu & Leiserowitz, 2009). Also, Mostafa (2012) in a multilevel analysis of the impact of globalization on proenvironmental intentions across 25 countries has shown the importance of simultaneously assessing contextual as well as individual-level factors in predicting sustainable behavior. Moreover, in a review of the theoretical and empirical literature, Kasser (2010) has suggested the value of connecting personal well-being and satisfaction of needs for safety and security to promote sustainable behavior.

World-mindedness

World-mindedness was positively correlated with sustainable behavior in the three samples, was a significant independent predictor of sustainable behavior in the US and Chinese samples, and approached significance in the Taiwanese sample. This finding supports the superordinate goal theory, where perceived generalized threat and the desire to eliminate it tends to promote collective solidarity, in this case being mindful of other peoples of the world experiencing similar challenges (e.g., Koger et al., 2011; Shepherd et al., 2009). Other studies have also shown a connection between sense of global citizenship and world-minded value orientation and environmentally responsible behaviors (e.g., Stern & Oskamp, 1987; Stern et al., 1993; Winter, 1996). Such relationships have been found by Der-Karabetian et al. (1996) among US and British college students; by Gatersleben, Murtagh, and Abrahamse (2012) among large-scale UK residents; by Werff et al. (2013) and by Nijssen and Douglas (2008) in the Netherlands; by Sener and Hazer (2008) among Turkish women consumers; and by Rawwas et al. (1996) among Austrian consumers. Moreover, Pies et al. (2010) have identified the importance of promoting global corporate citizenship to guide businesses to take ethically and morally justifiable decisions including environmental impact issues. Thus, consistent findings of a relationship between world-minded value orientation and sustainable behavior across many countries and populations suggest yet again a possible etic culture-common relationship that appears to transcend national and cultural boundaries. It also appears to be in line with theoretical models that incorporate personal and universal values in promoting sustainable behavior (e.g., Arbuthnott, 2009; Leiserowitz et al., 2006).

Global and national belonging

National belonging was a significant predictor of sustainable behavior in the US and Chinese samples but not in the Taiwanese sample, and global belonging was a predictor in the Taiwanese and US samples. These findings suggest the culture-bound nature of the

Table 5. Comparisons of Mean Scores on Sustainable Behavior in the US, Chinese, and Taiwanese Samples for Groups Identified by Combining National Belonging and Global Belonging Scores Using the Median Split Method: High National–High Global, High National–Low Global, Low National–High Global, and Low National–Low Global

COUNTRIES	HIGH NATIONAL HIGH GLOBAL			HIGH NATIONAL LOW GLOBAL			LOW NATIONAL HIGH GLOBAL			LOW NATIONAL LOW GLOBAL			<i>F</i>	<i>p</i>	η^2
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>			
United States	119	4.76 ^a	0.81	91	4.22 ^b	0.82	66	4.63 ^a	0.75	164	4.24 ^b	0.72	13.28	.000	.084
China	114	5.05 ^a	0.62	74	4.87 ^{a,b}	0.69	61	4.78 ^b	0.71	164	4.52	0.62	17.75	.000	.108
Taiwan	49	5.05 ^a	0.64	25	4.73 ^b	0.41	24	4.84 ^{a,b}	0.49	61	4.36	0.64	13.14	.000	.203

^{a,b}Means with same superscript letters are *not* statistically significant using LSD at $p < .05$ for post hoc mean comparisons.

relationship between global and national belonging and sustainable behavior. Also, not unexpectedly the Taiwanese sample had the highest mean score on the Global Belonging measure, consistent with their World-Mindedness score, reflecting a stronger sense of outward-looking global citizenship. This finding is consistent with the literature suggesting that the sense of self and identity is a factor in promoting proenvironmental action (Winter, 1996), as well as supportive of the superordinate goal theory that suggests an association between collective community solidarity and action to deal with a common threat. Studies that have shown the importance of global-human attachment and identity in encouraging proenvironmental activism in the Netherlands (Werff et al., 2013), in the United Kingdom (Gatersleben et al., 2012), and across multiple countries (Devine-Wright, 2012) further support the possible etic nature of the association between collective identity and action to deal with a threat that goes beyond national boundaries.

As Table 3 shows, these two measures of global and national belonging and identity tended to be correlated in all three samples. Such a finding supports the notion that stronger national identity and sense of belonging can coexist with stronger global identity and is consistent with emerging identity constructs such as hybridity (Kraidy, 2005), glocal cultural identity (Strizhakova et al., 2011), amalgamated identities (Banerjee, 2008), and omniculturalism (Moghaddam, 2009).

Since global and national belonging tended to be coextensive, for exploratory purposes an analysis was conducted to see if those who were high on both global and national identity reported levels of sustainable behavior that were different from those who were low on both or high on one and low on the other. The median split method was used to identify the groups: Those who scored above the medians on both the Global and National Belonging measures were classified under the High

National–High Global group, and so on (Table 5). In all three samples, those who were in the group that scored higher on both Global and National Belonging scored significantly higher on Sustainable Behavior than those who scored lower on both. In the Chinese and Taiwanese samples, those who scored lower on both also scored significantly lower on Sustainable Behavior compared to the other two groups that scored low on one and high on the other. It appears that those who tended to have a more integrated national and global sense of identity also tended to act more sustainably. However, it is reasonable to also argue that being more proenvironmentally active can promote and reinforce a stronger sense of integrated national and global belonging and identity. This finding further reinforces the contention of the superordinate goal theory that collective sense of identification and actions to deal with a common threat tend to be associated.

Globalization impact

The results showed that perceived impact of globalization in general and on own country were not predictors of sustainable behavior in any of the three samples but were positively correlated with each other in all three samples (Table 3). Those who perceived the general impact of globalization more positively also tended to see its impact on their own country more positively. Moreover, the data show that more positive perceived general impact of globalization was moderately and positively correlated with global belonging in all three samples, as well as more positive perceived impact of globalization on own country was positively correlated with national belonging. This is somewhat inconsistent with the superordinate goal theory in that the perceived positive impact rather than the negative impact (threat) is associated with a stronger sense of community identity and belonging. It is conceivable that the relationship of

perceived impact of globalization to sustainable behavior may be mediated by global and/or national belonging and identity. On the one hand, stronger sense of affiliation and identity with the global or national community may foster a more positive perception and attitude regarding the impact of globalization. On the other hand, the sense of global or national identity may be more readily accepted and endorsed if globalization is seen as having a more positive impact in terms of enhancing interdependence and improved quality of life in general or increasing the well-being of people in one's own country. Perhaps the process involved in the construction of identity in a globalized world may be partially mitigated by the way the impact of globalization is perceived and experienced (Castells, 1996; Elliott & Lemert, 2005; Savage et al., 2005).

Conclusions and limitations

Taken together, the findings of this study provide partial support for the superordinate goal theory that sustainable behavior is associated with perceived environmental risk, an enhanced sense of integrated national and global belonging, and world-minded value orientation. Moreover, the findings of this study in a broader cross-cultural context add to the already fairly well-developed psychological research on promoting sustainable behavior at the empirical and theoretical levels (Arbuthnott, 2009; Juare-Najera et al., 2010; Kazdin, 2009; Leiserowitz, 2006). It is also helpful to note that the predictors of sustainable behavior and patterns of relationships among the variables in this study seem to hold generally fairly well across the three country samples and tend to be consistent with studies in other countries and population samples. Although there seem to be certain culture-bound aspects to the relationships among the variables, it may be reasonable to begin to acknowledge that certain psychological factors may be etic and culture common in an increasingly globalized world and may be used to nurture sustainable behavior in different countries. This might suggest collaboration across countries in designing proenvironmental intervention strategies involving these variables.

Promoting an awareness of citizenship and sense of belonging to the global community (Banks, 2008) and reinforcing a universal world-minded value orientation together with highlighting personal environmental risk may be helpful in encouraging proenvironmental behavior through formal educational efforts in classroom settings, as has been reported by Bolscho and Hauenschild (2006) in Germany and by McKenzie-Mohr (2000) in community-based interventions. It may also be helpful to emphasize the links of proenvironmental values and behaviors to a sense of identity that integrates global and national belonging. Educational curricula in a school setting may

include exposure to the realities of increasing globalization and interdependence of countries and peoples and a sense of common fate and identity with all humanity, together with examples of the personal relevance and risk of environmental degradation and climate change in students' everyday life. Community-based proenvironmental interventions may also be enhanced by making a global connection regarding the consequences of climate change, water scarcity, pollution, and environmental toxins that cross national boundaries, together with invoking universalist world-minded values to elevate a sense of global belonging and interdependence.

Several limitations and delimitations of this study should be acknowledged. Caution should be used in generalizing the results of the study because of the convenient college student samples. Because of the length of the survey, fatigue effect may have been a factor regarding the responses to the measures toward the end. Also, the order of the measures used in the survey was not randomized, leaving open the possibility of an order effect. The measures on the survey were titled by the name of the constructs they intended to measure, perhaps leading to a priming effect by creating a mind-set that could have affected responses to the items. However, such titling could also have provided a break in the monotony of the continuous item presentation and encouraged completion of the survey. Future research could empirically examine the order and priming effect as well as determine the extent of possible social desirability bias. In spite of these potential limitations, it was remarkable to see good to strong internal consistency of the measures across the three samples and generally comparable predictable relationships among the measures themselves.

Future research could examine these variables in other countries to further assess their etic culture-common nature. Research could also examine whether the constructs measured here may be composed of secondary factors that may differ across countries and cultures and might reflect unique emic culture-bound elements. Moreover, it may be theoretically informative to see how global and national belonging and experience of globalization influence identity development during the formative years of adolescence. Also, assessing the effectiveness of proenvironmental interventions may involve evaluating the role played by psychological factors such as world-minded value orientation, perceived impact of globalization, and a sense of affiliation with the global-human community.

Appendix

Measures used in the study

Rating scale code: 1 = *Disagree Strongly*, 2 = *Disagree*, 3 = *Disagree Somewhat*, 4 = *Agree Somewhat*, 5 = *Agree*, 6 = *Agree Strongly*

R = Reverse code

Scoring: For each measure, item ratings are averaged after reversing indicated items

Globalization General Impact

(Developed for this study)

1. Globalization contributes to better economic conditions for everyone.
2. Over a period of time the process of globalization will lead to one global society that will benefit everyone.
3. Over a period of time the process of globalization will benefit everyone.
4. Globalization has enhanced dialogue among different religious faith traditions around the world.
5. Globalization has led to greater diversity of ideas and lifestyles around the world.
6. Globalization has helped the advancement of democracy in one form or another around the world.
7. The expanding use of social media (Internet, Facebook, Twitter, etc.) around the world contributes to increasing globalization.
8. In the globalized world multinational corporations ignore principles of business ethics motivated by pure profit. (R)
9. Globalization has led to people working in bad and unhealthy work environments. (R)
10. Globalization has helped increase awareness of the value of local cultures and histories of peoples around the world.
11. Globalization of consumer markets has contributed to global environmental problems such as global warming, loss of biodiversity, and deforestation. (R)
12. Globalization has increased instability and uncertainty in the financial and banking systems around the world. (R)

Globalization Impact on Own Country

(Developed for this study)

1. Globalization has impacted the economy of my country positively by raising the standard of living.
2. Globalization has made my country militarily more secure.
3. Globalization has damaged the natural environment of my country. (R)
4. Globalization has strengthened the economy of my country.
5. Globalization has increased social problems such as poverty and crime in my country. (R)
6. Because of globalization more people are suffering from stress-related problems in my country. (R)

7. Globalization has caused people in my country to be more politically involved in how their cities, towns and communities are governed.
8. Because of globalization more people in my country are interested in what happens in other countries.

National Belonging

(Der-Karabetian & Ruiz, 1997)

1. Being a citizen in my country plays an important role in my life.
2. Nowadays I consider being a citizen of my country a special privilege.
3. My destiny is closely connected to the destiny of my country.
4. My fate and future are bound with the people in my country.
5. One of my most important duties as a citizen is loyalty to my country.
6. If I were to be born all over again, I would wish to be born in my country.
7. If a stranger were to meet me and mistake me for someone from another country, I would correct the person and tell them what country I am from.

Global Belonging

(Der-Karabetian & Ruiz, 1997)

1. I feel that I am living in a global village.
2. I feel that what I do as a person could "touch" someone in another part of the world.
3. I feel like I am "next door neighbors" with people living in other parts of the world.
4. I feel that I am related to everyone in the world as if they were my family.
5. I feel that people around the world are more similar than different.
6. I think of myself as a citizen of the world.
7. I feel like my fate and future are bound with all of humankind.

World-Mindedness

(Der-Karabetian, 1992)

1. Our country should have the right to prohibit certain racial and religious groups from entering to live. (R)
2. Race prejudice may be a good thing for us because it keeps many undesirable foreigners from coming into my country. (R)

3. Foreigners are particularly detestable because of their religious beliefs. (R)
4. It would be better to be a citizen of the world than of any particular country.
5. Our responsibility to people of other races ought to be as great as our responsibility to people of our own race.
6. Our country should continue to strengthen its military power to protect against the unpredictable intentions of other countries. (R)
7. It would be dangerous for our country to make international agreements with nations whose religious beliefs are different than ours. (R)
8. Any healthy individual, regardless of race or religion, should be allowed to live wherever he or she wants to in the world.
9. If necessary, we ought to be willing to lower our standard of living to cooperate with other countries in getting an equal standard for every person in the world.
10. Some races ought to be considered naturally less intelligent than ours. (R)
11. An international police force ought to be the only group in the world allowed to have armaments.
12. All national governments ought to be abolished and replaced by one central world government.
13. We should teach our children to uphold the welfare of all people everywhere even though it may be against the best interests of our own country.
14. The present distribution of the world's wealth and resources should be maintained because it promotes the survival of the fittest. (R)
15. Concessions on the part of my country to other nations are morally right if the concession will promote world peace.
16. We have a moral obligation to share our country's wealth with the less fortunate people of the world.
17. The development of new technologies is the key to progress and thus worth any problems it might create. (R)
18. The primary goal of my country's foreign policy should be to promote peaceful resolutions of international conflicts.
19. The rich nations should share their wealth with the less fortunate people of the world.
20. My country should participate in international cooperative activities only if it has something to gain. (R)
21. The rich nations are morally obligated to take whatever measures are necessary to raise the living standards of the less fortunate people of the world.

22. Citizens of my country should be entitled to pursue whatever materialistic standard of living they desire, regardless of the effects on our environment and natural resources. (R)
23. My country has a right to increase its share of the world's wealth and resources regardless of the effects on less developed countries. (R)
24. My country does not have a moral obligation to share its technological and economic riches with the less fortunate people of the world. (R)
25. The potential social and psychological problems resulting from a technological innovation should be assessed prior to the development of the technology.
26. Technological progress is worth the cost to our environment and natural resources. (R)

Sustainable Behavior

(Der-Karabetian et al., 1996)

1. I would be willing to make personal sacrifices to reduce environmental pollution, although the immediate results may seem unimportant.
2. Whenever possible I recycle paper, plastic, and other material.
3. I try to save water and electricity as much as I can.
4. I would not hesitate to tell people to have fewer children because overpopulation damages the global environment.
5. Individual behaviors that help protect natural resources also help sustain the well-being and livelihood of local communities.
6. I tend to purchase environmentally friendly products rather than buy cheap environmentally unfriendly alternatives.

Personal Environmental Risk

(Der-Karabetian et al., 1996)

1. It is likely that during my lifetime there may come a time when there may not be enough energy to meet my daily needs.
2. It is likely that I will develop skin cancer as a result of ozone depletion.
3. It is possible that any future children my descendants or I might have may be born with birth defects as a result of contaminated food or water.
4. It is possible that my family or I could develop health problems as a result of dangerous chemicals in the environment such as pesticides or pollution.
5. It is likely that during my lifetime my family and I might experience serious water shortage, limiting use per household.

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