# Study Abroad Experiences and Global Citizenship: Fostering Proenvironmental Behavior

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## Abstract

Short-term study abroad programs currently account for more than 50% of students who study overseas. Using an adaptation of the Value–Belief–Norm theory of proenvironmental behavior (Stern, 2000), we hypothesized that study abroad nurtures global citizenship related to ecologically conscious behaviors by strengthening core relations among environmental values, beliefs, and norms. The sample consisted of students ($n$ = 623) from 10 U.S. universities participating in a 4-week study abroad program to either Australia or New Zealand in 2008 and 2009. A pre-, posttest design was adopted in which students voluntarily completed a survey instrument on the first and last days of the program in the destination country. Results of the study suggested that the modified Value–Belief–Norm approach provides a robust theoretical framework, used in conjunction with theories of learning, for explaining how proenvironmental behavior is nurtured. These findings provided empirical support for the efficacy of short-term study abroad programs and developed further support for the importance of strong pedagogical techniques implemented by competent instructors.

## Keywords

developmental model of intercultural sensitivity, earth citizen, environmental values, experiential learning theory, global citizenship, globalization and international higher education, study abroad, transformational learning theory, value–belief–norm theory

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The increasing globalization of political, economic, and environmental issues requires that current and future leaders understand the worldwide consequences of their decisions. Understanding and developing solutions to many environmental issues will require people to transcend culturally imposed boundaries and to take on the role of global citizens. A global citizen views the world as interdependent and acts to advance himself or herself and others by understanding the interconnections among people, institutions, and the environment (Appiah-Padi, 2001). Although the call to action to implement programs that are designed to expose students to the tenets of global citizenship is growing (Dolby, 2007; Hanson, 2010; Tarrant, 2010), there has been a paucity of writing on how to best accomplish this goal.

One method of encouraging the civic of global citizenship is through study abroad. Far outpacing the growth of undergraduate enrollment, from 1997 to 2007, participation in study abroad programs increased from about 99,500 to almost 242,000, a 143% increase (National Center for Education Statistics [NCES], 2010); making it one of the largest areas of growth in higher education. Under the umbrella of international education, short-term experiences (i.e., time abroad equivalent to less than a full semester) are the fastest growing segment of study abroad programs, accounting for more than 50% of all students who studied overseas in 2007/2008 (Institute of International Education, 2009). Although short-term experiences are popular with students, their efficacy has been criticized. Long-standing concerns include that study abroad programs are too isolated, are poorly implemented, do not meet participants' needs, and unintentionally promote stereotypical views of host cultures (Bikson & Law, 1994; Medina-López-Portillo, 2004). However, Dolby (2007) challenged these assumptions. She wrote that some contend that study abroad experiences (including not only immersion in a different culture but also environment and curriculum facilitated by competent instructors) increase students' sensitivity to, and awareness of, complex global issues. In turn, these future leaders will act in a manner consistent with that of a *global citizen* (Tarrant, 2010).

Although several studies have documented the learning outcomes associated with study abroad, few conceptual frameworks explain the processes that students undergo to achieve those outcomes (Tarrant, 2010). Dolby (2007) hypothesized that studying abroad promotes a broader worldview among students. Several authors (e.g., Hanson, 2010; Hendershot & Sperandio, 2009) have suggested that students' adoption of *global citizenship* is encouraged by study abroad programs through a "transformational learning process," in which new values, beliefs, and meanings are created and formed (Hower, 2006) and the ideals of justice-oriented citizenship are promoted (Tarrant & Sessions, 2008). Literature on transformational learning has not specifically addressed how educational programs encourage individuals to develop new values and beliefs. In the context of human–environment interactions, Tarrant (2010) suggested that Stern's (2000) Value–Belief–Norm (VBN) theory provides a framework that can be adapted to understand the mechanisms potentially at play in study abroad programs that seek to foster global citizenship, especially with regard to environmental issues. VBN proposes that individuals are motivated to act (as global citizens) by
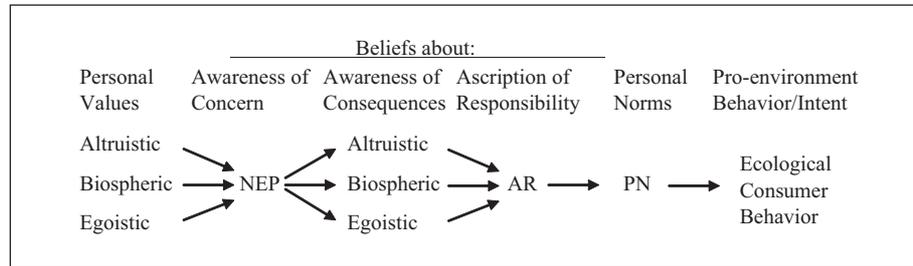
**Figure 1.** Value–belief–norm model

(a) beliefs that external conditions have adverse consequences for themselves, other humans, and/or other living things, and (b) a personal obligation for preventing those consequences. Hence, in the context of study abroad, and utilizing Dobson's (2003) concept of an "Earth Citizen" (i.e., someone who holds environmentally virtuous values and acts in an environmentally responsible manner), the framework suggests that global citizenship can be fostered in students via the modification of beliefs about environmental conditions, which in turn influence proenvironmental behaviors. Based on this framework, our investigation tested an adapted VBN model within the context of a short-term study abroad program promoting learning outcomes related to global citizenship and proenvironmental behavior. In doing so, we hope to address the concern that students are not able to learn in significant ways via short-term study abroad programs and increase understanding of how the context, curriculum, and instruction of a study abroad program influences students' learning.

## Literature Review

As noted, we used Stern's (2000) VBN theory as the framework for this investigation. We begin with an overview of the literature concerning the tenets of VBN and the context in which we apply it. This context concerns a study abroad experience that focused on enhancing understanding of issues tied to global citizenship and sustainable living.

### Value–Belief–Norm Theory

VBN theory (Stern, 2000) posits that proenvironmental behaviors are the product of an intermix of values, information about attitude objects, and social interactions. Specifically, the developers of the theory suggested that proenvironmental behavior manifests itself in causal processes involving values, attitudes, beliefs, and norms[1] (Figure 1).

The first set of constructs in the VBN model concern *personal values*. Values salient to environmentalism are egoistic, altruistic, and biospheric (Stern, Dietz, & Kalof, 1993). Egoistic values place the greatest importance on one's own welfare.

With regard to environmental concern, an individual would consider the personal costs of supporting or opposing protection of an ecosystem when reflecting on their egoistic values. Altruistic values reflect the importance that one places on the welfare of other people. These values consider what the greatest good is, concerning the health of the ecosystem, for the greatest number of people. Biospheric values place importance on nonhuman aspects of the environment. Although value orientation does not directly influence an individual's intention to behave, values do activate norms that, in turn, influence intention to behave (norm-activation theory of altruism, Schwartz, 1973). Empirical studies have concluded that social altruistic and biospheric values are positively related to personal norms regarding the environment (e.g., Steg, Dreijerink, & Abrahamse, 2005; Stern, Dietz, & Guagnano, 1995).

Stern, Dietz, et al. (1995) suggested that *personal values* influence an individual's *environmental worldview*. An *environmental worldview* is a set of general beliefs about the Earth and human-environment relations (Stern, Deitz, et al., 1995). Guagnano, Stern, and Dietz (1995) posited that the social structure in which an individual is embedded substantially influences their worldview. To measure worldview, VBN theory incorporates Dunlap, Van Liere, Mertig, and Jones' (2000) revised New Ecological Paradigm (NEP). The NEP is based on the understanding that human survival is part of a larger system and dependent on the health of the global environment. Following worldview, the next construct in the VBN model is *awareness of consequences* for valued objects (AC) of ongoing or anticipated environmental conditions for self, for others, and for the ecosystem. Following AC in the VBN model is *ascription of responsibility* (AR), defined as an individual's attitude toward their responsibility to mitigate the impacts identified previously.

Following AR and prior to an individual's intention to behave, the VBN model incorporates an individual's *personal norms* (PN) regarding the environment. PNs are internalized standards that suggest how one should behave in a given context. Thus PNs can be considered one's sense of moral obligation. In the VBN model, PNs directly influence the individual's attitudes toward actions (i.e., intention to behave) that maintain or improve the health of the ecosystem. Finally, behavioral intention is positively related to the individual's behavior.

It is also important to note that Stern's (2000) conceptualization of VBN and others' analyses have indicated "that each variable in the causal chain is related to the next variable, and may also be directly related to variables further down the chain" (Steg et al., 2005, p. 417).

## Global Citizenship and the Earth Citizen

Hanson (2010) defined a global citizen as one who is "involved locally, nationally, and internationally; is conscientious, informed, and educated about issues; exhibits environmental and social responsibility; advocates alongside the oppressed" (p. 80). Similarly, according to Dobson (2003), a global (a.k.a. Earth) citizen[2] accepts an

obligation to act in a just and fair manner. This postcosmopolitan view of citizenship emphasizes values related to justice, civic obligations, and the environment. By consuming fewer environmental resources and/or supporting the distribution of resources to less wealthy nations, it is argued that Earth Citizens (a) are motivated by a range of values that consider the welfare and concern of other distant people (altruistic), themselves (egoistic), and/or other living creatures (biospheric) in relation to the unjust consequences of an inequitable distribution of environmental resources, and (b) accept an obligation/role in alleviating the injustice caused by the distribution of resources. Hence Bryant (2006) and Winn (2006) contended that the environment is the context in which global citizenship is best considered because the outcomes of proenvironmental behavior most often do not have an immediate benefit to the individual.

## Learning Theories and Value–Belief–Norm Theory

Past authors (e.g., Hendershot & Sperandio, 2009; Winn, 2008) have suggested that study abroad programs can nurture the development of a global citizenship identity in participating students. These authors and others have applied several theories of learning (e.g., experiential learning theory [ELT], transformational learning theory [TLT], and the developmental model of intercultural sensitivity [DMIS]) to explain students' learning processes related to study abroad programs.

Originating from the works of Dewey, Lewin, and Piaget, ELT stresses cognition over affect, but also recognizes the importance of the subjective experience in adult learning (Kolb, 1984). The ELT model is holistic, as it makes allowances for individuals to learn via the style that best suits their personality and past experiences. According to Kolb, Boyatis, and Mainemelis (2000), the theory states that new knowledge is garnered through grasping experiences (i.e., concrete experience and abstract conceptualization) and transforming experiences (i.e., reflective observation and active experimentation). Specifically, the four-stage learning cycle progresses as follows:

> Concrete experiences are the basis for observations and reflections. These reflections are assimilated and distilled into abstract concepts from which new implications for action can be drawn. These implications can be actively tested and serve as guides in creating new experiences. (Kolb et al., 2000, p. 195)

Going beyond experiential learning, Mezirow (1990) developed a theory of transformational learning. TLT "holds that adult learners undergo a process of constructivist learning in which they experience deep shifts in their mental models, thereby coming to change perspective, become authors of their own knowledge, and increase personal agency" (Hendershot & Sperandio, 2009, p. 46). Several authors (e.g., Hanson, 2010; Hendershot & Sperandio, 2009; Tarrant & Sessions, 2008) have argued that fostering global citizenship is best accomplished through a transformational

learning process. Hanson (2010) found that transformational learning processes applied to international education led to shifts in students' "values, beliefs, behaviors, skills, insights, and particularly one's overall disposition to critical and self-reflection" (p. 81).

Another framework, based in constructivism, that has been applied to understanding the learning that takes place as a result of study abroad programs is Bennett's (1986) DMIS. That model focuses on the development of worldviews (Pedersen, 2009). "The underlying assumption of the model is that as one's experience of cultural difference becomes more sophisticated, one's competence in intercultural relations potentially increases" (Hammer & Bennett, 1998). DMIS identifies a series of six stages that students may move along when experiencing different cultures.

Each stage is expressed in the students' attitudes and behavior related to differences they perceive between their own culture and others. The stages are aligned on a continuum from ethnocentric (i.e., denial, defense, and minimization) to ethnorelative (i.e., acceptance, adaptation, and integration). By recognizing where students are on this continuum, educators can tailor study abroad programs to facilitate development into the next stage. For example, Pedersen observed that guided and reflective intercultural pedagogy encouraged short-term study abroad students to move toward DMIS' ethnorelative stages.

Given that VBN theory is useful in understanding the interplay among values, beliefs, norms, and attitudes regarding the environment; it may logically be used to investigate global citizenship in the context of study abroad programs. To do so, Tarrant (2010) wrote, "first we need to assume that 'good' citizens are made and not born, i.e., global citizenship is a learned and nurtured behavior . . ." (p.442); an argument that is supported by several researchers (e.g., Norris & Gillespie, 2009; Yu et al., 2008). For example, Yu and colleagues found that foreign interaction through engagement in study abroad programs leads to personal growth, including modified worldviews. Hence, this investigation utilized an adapted VBN model within the context of a short-term study abroad program promoting learning outcomes related to global citizenship and proenvironmental behavior.

## Method

### Setting and Study Sample

Our sample was comprised of students ($n = 623$; 89.5% response rate) from 10 U.S. universities participating in 4-week/six-credit study abroad programs to either Australia or New Zealand in 2008 (55% of the sample) and 2009. Each program sought to modify values, promote proenvironmental behaviors, and change how students view themselves, the world, and their role as an Earth citizen via (a) classroom-based study (at host institutions in the South Pacific) and field coursework, and (b) service-learning and cultural activities.

Females comprised 70% of the sample, and juniors comprised 45% (gender and academic standing are comparable to national averages recorded by the Institute of International Education, 2009). Students' ages ranged from 18 to 42 years with most students being between 20 and 21 years old. This was the first study abroad experience for more than 90% of the students.

## Instrument Design

A pre-/posttest design was adopted in which students voluntarily completed a survey on the first (pre-) and last (post-) days of the program. The data used to conduct the analyses for this investigation were items and scales used in previous studies that have measured the constructs involved in the VBN model. *Personal values* were measured using three value orientations (i.e., altruistic, biospheric, and egoistic) on a 7-point response scale (where 1 = *not at all important* and 7 = *extremely important*) from Stern, Kalof, Dietz, and Guagnano (1995). The revised New Ecological Paradigm (NEP) scale (Dunlap et al., 2000) was used to indicate beliefs about human–environment relations and was divided into two dimensions: biocentric and anthropocentric. Students were asked to respond to the NEP items on a 7-point agreement scale where 1 = *strongly disagree*, 4 = *neither agree nor disagree*, and 7 = *strongly agree*. *Awareness of consequences* (AC) of Environmental Conditions was assessed on the same 7-point agreement scale using the Beliefs about Consequences of Environmental Conditions scale (Stern, Kalof, et al., 1995) comprised of the following dimensions: altruistic, biospheric, and egoistic. *Ascription of responsibility* (AR) was measured using two items: "How responsible are you for environmental problems?" (Schultz & Zelenzy, 1998) and "How would you rate your overall personal responsibility to improve the environment, on a 7-point response scale where 1 = *not at all responsible* and 7 = *extremely responsible* (Schultz & Zlelensky, 1998)? The measurement of *personal norms* (PN) used a scale developed by Minton and Rose (1997) that was adapted from Schwartz (1977). The responses could range from 1 = *no obligation* to 7 = *very strong obligation*. We measured proenvironmental behavior (i.e., ECCB) using items selected from the Ecological Conscious Consumer Behavior scale (Roberts & Bacon, 1997). The pretest examined past behavior and the posttest addressed behavioral intentions with a 7-point response scale where 1 = *no past or no intended future behavior* and 7 = *a high frequency of past or intended future behavior*.

## Analysis

We began the analysis with confirmatory factor analyses (CFA) using LISREL 8.80 to verify the hypothesized factor structure for each construct. From this, we removed several items owing to cross-loadings among factors. The final set of items is listed in Tables 1 through 6.

Following the CFA, we tested the VBN model using data collected during the pre-/postsurvey data collection points. To compare models, we treated the two data

**Table 1.** Personal Values CFA Results

| Factor-Item | λ | t | Pre Mean | SD | Post Mean | SD |
|---|---|---|---|---|---|---|
| Biospheric (pre: *M* = 5.55, *SD* = .94, α = 86; post: *M* = 5.84, *SD* = .93, α = .91) | | | | | | |
| Unity with nature, fitting in with nature | .76 | 22.02 | 4.93 | 1.26 | 5.45 | 1.15 |
| Protecting the environment, preserving nature | .90 | 28.70 | 5.79 | 1.05 | 6.00 | 0.97 |
| Respecting the Earth, harmony with other species | .86 | 26.77 | 5.61 | 1.98 | 5.88 | 1.07 |
| Preventing pollution, conserving natural resources | .85 | 26.29 | 5.87 | 1.07 | 6.03 | 1.01 |
| Altruistic (pre: *M* = 5.72, *SD* = 1.06, α = .82; post: *M* = 5.71, *SD* = 1.07, α = .83) | | | | | | |
| A world at peace, free of war and conflict | .68 | 18.33 | 5.49 | 1.36 | 5.55 | 1.32 |
| Equality, equal opportunity for all | .89 | 26.08 | 5.95 | 1.18 | 5.89 | 1.22 |
| Social justice, correcting injustice, care for the weak | .81 | 23.07 | 5.71 | 1.16 | 5.68 | 1.18 |
| Egoistic (pre: *M* = 3.29, *SD* = 1.05, α = .70; post: *M* = 3.83, *SD* = 1.16, α = .75) | | | | | | |
| Authority, the right to lead or command | .57 | 13.82 | 4.67 | 1.33 | 4.54 | 1.38 |
| Wealth, material possessions, money | .66 | 15.80 | 3.89 | 1.28 | 3.85 | 1.38 |
| Social power, control over others, dominance | .92 | 20.84 | 2.97 | 1.36 | 3.08 | 1.48 |

Note: $\chi^2_{df=33}$ = 187.68; RMSEA = .085; NFI = .96; NNFI = .95; CFI = .97.

collection points as distinct groups. The analysis focused on detecting variation in the strength/valence of the regression coefficients in the VBN model across the two groups. Rather than testing a full latent variable model, we also parceled the manifest items to create summative indices (Matsunaga, 2008) that were used in testing the path model across the two groups. We hypothesized that the associations among constructs tested in the postexperience model would be stronger than in the pretest, suggesting that the study abroad experience influenced the students' values and beliefs regarding the environment.

## Results

The results of the CFAs, presented in Tables 1 through 6, indicate that the psychometric properties of each of the scales were satisfactory. Each item loaded adequately (>.50) on its respective dimension and the goodness-of-fit indices for each scale were acceptable ($\chi^2_{df=6}$ = 2.64; RMSEA<.01; NFI>.99; NNFI>.99; CFI>.99). Furthermore, with the exception of the biospheric dimension of the AC scale, all of the Cronbach's alpha values were above .70, indicating strong internal consistency. Regarding AC's biospehric dimension (two items; α = .51), Cortina (1993) and Gay (1991) indicated that it was acceptable to retain factors with lower alpha values when working with new scales or factors with a low number of items.

**Table 2.** Environmental Worldview (EWV) CFA Results

| Factor-Item | λ | t | Pre | | Post | |
|---|---|---|---|---|---|---|
| | | | Mean | SD | Mean | SD |
| Biocentric (pre: *M* = 5.06, *SD* = .91, α = .78; post: *M* = 5.28, *SD* = .92, α = .80) | | | | | | |
| We are approaching the limit of the number of people the Earth can support | .66 | 527.64 | 5.06 | 1.46 | 5.33 | 1.35 |
| When humans interfere with nature it often produces disastrous consequences | .54 | 412.94 | 4.87 | 1.32 | 5.17 | 1.27 |
| Humans are severely abusing the environment | .74 | 613.3 | 5.33 | 1.26 | 5.46 | 2.00 |
| The earth is like a spaceship with very limited room and resources | .61 | 481.69 | 4.81 | 1.37 | 5.09 | 1.42 |
| The balance of nature is very delicate and easily upset | .52 | 395.04 | 5.04 | 1.20 | 5.28 | 1.23 |
| If things continue on their present course, we will soon experience a major ecological catastrophe | .72 | 592.11 | 5.35 | 1.34 | 5.31 | 1.34 |
| Anthropocentric (pre: *M* = 4.65, *SD* = 1.08, α = .72; post: *M* = 5.36, *SD* = 1.16, α = .75) | | | | | | |
| Humans have the right to modify the natural environment to suit their needs | .58 | 443.91 | 4.18 | 1.33 | 4.25 | 1.38 |
| The balance of nature is strong enough to cope with the impacts of modern industrial nations | .58 | 441.21 | 4.95 | 1.26 | 4.79 | 1.45 |
| The so-called "ecological crisis" facing human kind has been greatly exaggerated | .80 | 646.75 | 4.87 | 1.43 | 5.03 | 1.5 |
| Humans were meant to rule over the rest of nature | .65 | 506.99 | 4.61 | 1.79 | 4.80 | 1.78 |

Note: $\chi^2_{df=34}$ = 13,563.24; RMSEA = .079; NFI = .96; NNFI = .95; CFI = .96. Scale: 1 = *strongly disagree*; 4 = *neither agree nor disagree*; 7 = *strongly agree*.

To examine variation among the structural paths in our model at pre-/posttest occasions, we tested an adaptation of Stern's (2000) VBN model (Figure 1). Our testing began with the pooled sample (i.e., pre-/poststudy abroad experience data combined). The result of this analysis illustrated that one of the hypothesized paths (i.e., AC's altruistic dimension → AR) was nonsignificant, and thus removed from the model (Schumacker & Lomax, 1996). The data also indicated that two additional paths be added to the model (i.e., personal value's biospheric dimension → AR and personal value's biospheric dimension → PN). These additional paths are consistent with the conceptual literature on the VBN theory[3] (Stern, 2000; Stern, Kalof et al., 1995). Following these path modifications, the structural model illustrated satisfactory model fit ($\chi^2_{df=30}$ = 440.64; RMSEA = .099; NFI = .96; NNFI = .94; CFI = .97). Table 7 summarizes the goodness-of-fit indices for the final model of each step of the invariance tests.

**Table 3.** Awareness of Consequences (AC) CFA Results

| | | | Pre | | Post | |
|---|---|---|---|---|---|---|
| Factor-Item | λ | t | Mean | SD | Mean | SD |
| Biospheric (pre: M = 4.94, SD = 1.18, α = .50; post: M = 5.19, SD = 1.13, α = .51) | | | | | | |
| Over the next decade, thousands of species of plants and animals will become extinct | .58 | 11.69 | 5.11 | 1.33 | 5.26 | 1.18 |
| Claims that we are changing the climate are greatly exaggerated | .60 | 12 | 4.77 | 1.56 | 5.12 | 1.55 |
| Altruistic (pre: M = 5.71, SD = 1.09, α = .82; post: M = 5.86, SD = 1.07, α = .83) | | | | | | |
| Environmental protection benefits everyone | .81 | 23.6 | 5.74 | 1.23 | 5.87 | 1.21 |
| Environmental protection will help people have a better quality of life | .87 | 25.97 | 5.67 | 1.14 | 5.85 | 1.10 |
| Egoistic (pre: M = 6.05, SD = .93, α = .86; post: M = 6.17, SD = .87, α = .89) | | | | | | |
| Environmental protection will provide a better world for me and my children | .94 | 29.96 | 6.03 | 0.96 | 6.16 | 0.94 |
| Environmental protection is beneficial to my health | .86 | 26.32 | 6.06 | 1.03 | 6.17 | 0.89 |

Note: $\chi^2_{df=6}$ = 2.64; RMSEA<.01; NFI>.99; NNFI>.99; CFI>.99. Scale: 1 = *strongly disagree*; 4 = *neither agree nor disagree*; 7 = *strongly agree*.

**Table 4.** Ascription of Responsibility (AR) Scale Statistics

| | Pre | | Post | |
|---|---|---|---|---|
| Factor-Item | Mean | SD | Mean | SD |
| AR (pre: M = 4.70, SD = 1.05, α = .72; post: M = 5.18, SD = 1.03, α = .80) | | | | |
| How responsible are you for environmental problems? | 4.56 | 1.15 | 5.05 | 1.15 |
| How would you rate your overall personal responsibility to improve the environment? | 4.84 | 1.22 | 5.30 | 1.11 |

Note: Scale: 1 = *not at all responsible*; 7 = *extremely responsible*. *CFA was not conducted for this 2-item, single dimension scale.

We tested the refined structural model using the pre-/poststudy abroad experience data. This entailed an examination of the model across the two groups, simultaneously, testing for variation in the regression coefficients.

To test for variation among the regression coefficients for the two groups, we constrained regression paths to be equal across the two groups, one at a time. Variations in strength/valence of paths were evidenced in significant shifts in the model chi square (significant $\Delta\chi^2$ = 3.84, $\Delta df$ = 1). These tests revealed that there were statistically significant differences in seven regression coefficients between the pre-/postexperience data (Figure 2). A description of these differences follows.

**Table 5.** Personal Norms (PN) CFA Results

| | | | Pre | | Post | |
|---|---|---|---|---|---|---|
| Factor-Item | λ | t | Mean | SD | Mean | SD |
| PN (pre: M = 4.75, SD = 1.13, α = .91; post: M = 5.25, SD = 1.19, α = .95) | | | | | | |
| Do you feel a personal obligation to buy environmentally friendly products for your household? | .86 | 26.87 | 4.86 | 1.35 | 5.25 | 1.27 |
| Do you feel a personal obligation to recycle household waste? | .76 | 22.13 | 5.57 | 1.32 | 5.9 | 1.16 |
| Do you feel a personal obligation to pay attention to advertisements about products which are safe for the environment? | .84 | 25.99 | 4.81 | 1.44 | 5.26 | 1.39 |
| Do you feel a personal obligation to read and compare package labels for environmentally safe ingredients when you shop? | .87 | 27.35 | 4.1 | 1.57 | 4.78 | 1.53 |
| Do you feel a personal obligation to buy products made with recycled ingredients? | .89 | 28.35 | 4.62 | 1.48 | 5.18 | 1.45 |
| Do you feel a personal obligation to buy larger size products in order to reduce waste? | .73 | 21.08 | 4.34 | 1.51 | 4.97 | 1.51 |
| Do you feel a personal obligation to do whatever you can to help protect the environment? | .83 | 25.43 | 5.03 | 1.36 | 5.45 | 1.35 |
| Do you feel a personal obligation to buy products made by companies known for being environmentally responsible? | .90 | 29.33 | 4.68 | 1.48 | 5.23 | 1.46 |

Note: $\chi^2_{df = 19}$ = 116.57; RMSEA = .088; NFI = .99; NNFI = .98; CFI = .99. Scale: 1 = *no obligation*; 7 = *very strong obligation*.

## Pre-/Postexperience VBN Model Differences

*Personal values → EWV*. Several differences involved students' *personal values* and their relationships with subsequent constructs. Specifically, the biospheric dimension's effect on the two *environmental worldview* (EWV) dimensions was weaker for the preexperience data, biospheric (personal values) → biocentric (EWV): β = .33; *SE* = .04; biospheric (personal values) → anthropocentric (EWV): β = .41; *SE* = .04, versus the postexperience, biospheric (personal values) → biocentric (EWV): β = .23; *SE* = .04 biospheric (personal values) → anthropocentric (EWV): β = .14; *SE* = .05).

However, the relationships between the altruistic dimension and the EWV dimensions were stronger, preexperience—alturistic (personal values) → biocentric (EWV): not significant; altruistic (personal values) → anthropocentric (EWV): β = .09; *SE* = .04, and postexperience—alturistic (personal values) → biocentric (EWV): β = .24; *SE* = .03; altruistic (personal values) → anthropocentric (EWV): β = .25; *SE* = .04. These observations correspond with a slightly lower level of variance explained in the EWV

**Table 6.** Ecological Conscious Consumer Behavior (ECCB) CFA Results

| Factor-Item | λ | t | Pre | | Post | |
|---|---|---|---|---|---|---|
| | | | Mean | SD | Mean | SD |
| ECCB (pre: *M* = 4.04, *SD* = 1.18, α = .87; post: *M* = 5.14, *SD* = 1.14, α = .92) | | | | | | |
| To save energy, I (will) drive my car as little as possible | .57 | 15.24 | 3.77 | 1.63 | 4.66 | 1.6 |
| I (will) use a recycling center or in some way recycle some of my household trash | .63 | 17.27 | 5.28 | 1.71 | 5.93 | 1.29 |
| I (will) convince members of my family or friends not to buy some products which are harmful to the environment | .84 | 25.74 | 3.65 | 1.9 | 5.06 | 1.59 |
| I (will) try to only buy products that can be recycled | .85 | 26.41 | 3.65 | 1.56 | 4.89 | 1.53 |
| I (will) switch products for ecological reasons | .89 | 28.64 | 3.79 | 1.74 | 4.95 | 1.5 |
| When I purchase products, I (will) always make a conscious effort to buy those products that are low in pollutants | .89 | 28.25 | 3.58 | 1.63 | 4.87 | 1.51 |
| I (do/will) not buy household products that harm the environment | .76 | 22.4 | 3.47 | 1.46 | 4.6 | 1.49 |
| I (will) buy high-efficiency light bulbs to save energy | .58 | 15.48 | 4.99 | 1.8 | 5.9 | 1.29 |
| I (will) purchase household appliances which use less electricity than other brands | .65 | 19.94 | 4.16 | 1.85 | 5.41 | 1.39 |

Note: $\chi^2_{df = 26}$ = 131.68; RMSEA = .083; NFI = .98; NNFI = .98; CFI = .99. Scale: 1 = *no past or no intended behavior*; 7 = *A high frequency of past or intended behavior*.

**Table 7.** Summary of Invariance Tests

| Model | $\chi^2$ | $\Delta \chi^2$ | df | $\Delta$ df | RMSEA | NFI | NNFI | CFI |
|---|---|---|---|---|---|---|---|---|
| Structural (pooled) model | 440.64 | — | 30 | — | .099 | .96 | .94 | .97 |
| Baseline | | | | | | | | |
| preexperience | 179.52 | — | 30 | — | .086 | .97 | .95 | .97 |
| postexperience | 319.87 | — | 30 | — | .110 | .95 | .92 | .96 |
| 1. (H1-Structure) | 499.39 | — | 60 | — | .100 | .96 | .94 | .97 |
| 2. (H2-Final Regression coefficients) | 517.43 | 18.04 | 70 | 10 | .095 | .96 | .94 | .97 |

dimensions (preexperience: biocentric $R^2$ = .21, anthropocentric $R^2$ = .31; postexperience: biocentric $R^2$ = .18, anthropocentric $R^2$ = .24).

*Personal values → AR.* Furthermore, the regression coefficient for the path between students' biospheric *personal value* dimension and *ascription of responsibility* (AR) was larger for the preexperience data (β = .46; *SE* = .04) than for the postexperience
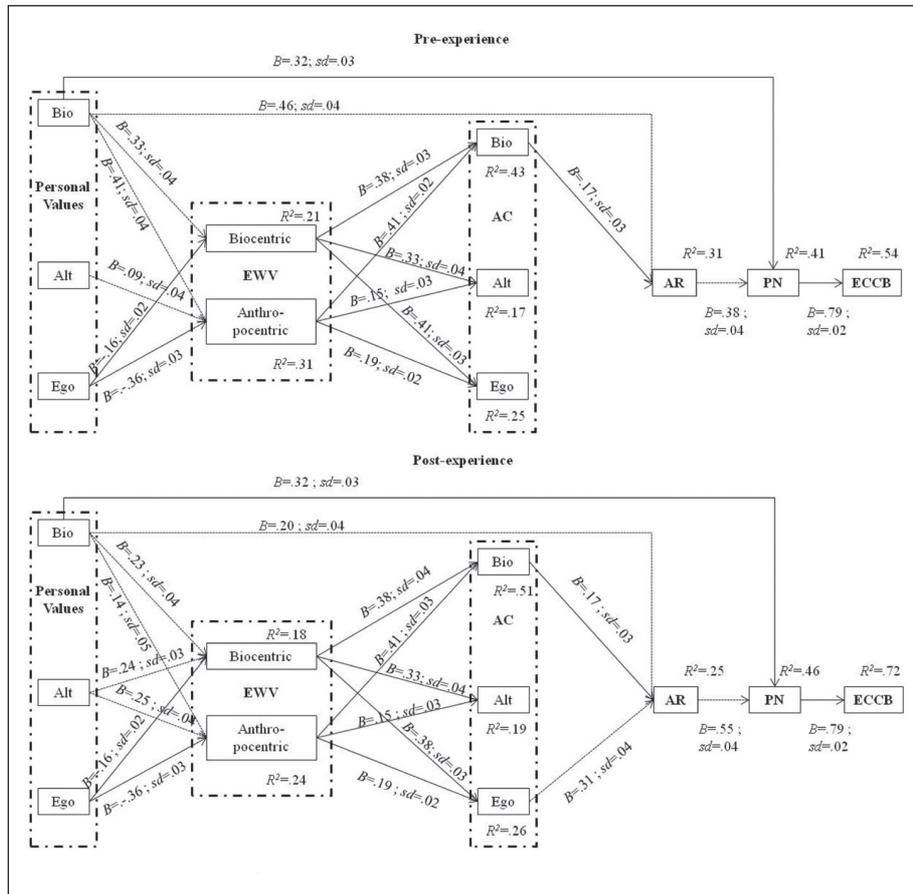
**Figure 2.** Final Model

Note: $\chi^2_{df=30}$ = **517**.43; RMSEA = .095; NFI = .96; NNFI = .94; CFI = .97); "....." paths indicate a significant difference in the regression coefficient between the pre- and postexperience data.

data ($\beta$ = .20; *SE* = .04). This effect accounts for the increase in strength between *awareness of consequences* (AC) and AR.

*EWV → AC.* We observed no differences in the regression coefficients for the paths between *environmental worldview* and *awareness of consequences*. However, the variance explained for each of the dimensions of AC was greater after the study abroad experience (preexperience: biospheric $R^2$ = .43, altruistic $R^2$ = .17, egoistic $R^2$ = .25; postexperience: biospheric $R^2$ = .51, altruistic $R^2$ = .19, egoistic $R^2$ = .26).

*AC → AR.* The *awareness of consequences—ascription of responsibility* regression coefficient was not significant for the preexperience data but was significant for the postexperience data ($\beta$ = .31; *SE* = .04). However, we observed a slightly smaller amount of variance explained in AR (preexperience: $R^2$ = .31; postexperience $R^2$ = .25).

*AR → PN*. In addition, the path between *ascription of responsibility* and *personal norms* (PN) had a significantly larger coefficient for the postexperience data ($\beta = .55$; $SE = .04$) than for the preexperience data ($\beta = .38$; $SE = .04$). The variance explained was also larger at the postexperience collection point (preexperience: $R^2 = .41$; postexperience $R^2 = .46$).

*Ecological conscious consumer behavior*. Beyond the differences in beta coefficients between the two data points, there was also a difference in the variance explained for the final outcome variable, *ecological conscious consumer behavior* (ECCB). Data from the preexperience survey indicated that 54% of the variance for ECCB was explained, whereas for the data from the postexperience survey, 72% of the variance was explained.

## Discussion

This investigation tested an adapted VBN framework for explaining the constructs influenced by participation in a short-term study abroad experience (i.e., program aspects including the environment and curriculum facilitated by competent instructors) that promotes learning outcomes related to global citizenship. We identified variation among the structural paths in our model at pre-/poststudy abroad occasions. The additional paths present in the postexperience model (i.e., between the altruistic personal value dimension and the biocentric dimension of participants' EWV and between the egoistic dimension of AC and AR) suggest that the students' experience (including periods of reflective observation and active experimentation built into the curriculum and encouraged by the instructors) encouraged them to consider their values and beliefs about the environment. In turn, this new information (similar to the notion of abstract concepts described in Kolb's, 1984, ELT) allowed the students to make connections between the constructs that were not present prior to their experience. This conclusion provides empirical support for Tarrant's (2010) suggestion that Stern's (2000) VBN theory provides a framework to understand the mechanisms at play in study abroad programs focusing on environmental issues.

Furthermore, the data revealed that the model explained a greater percentage of the final outcome variable (i.e., ECCB) after the students' experience than before, indicating that global citizenship can be fostered through study abroad experiences. We also found that postexperience results demonstrated a greater number of statistically significant paths, suggesting that the study abroad experience encouraged students to incorporate their new knowledge into their values and attitudes regarding the environment. This conclusion confirms the work of learning theorists (e.g., Hanson, 2010; Hendershot & Sperandio, 2009) who have found that study abroad experiences can be the impetus for shifts in students' values, beliefs, and behaviors. Moreover, challenging long-standing concerns in the study abroad community, this investigation illustrated that these shifts can occur in students who participate in short-term programs. Based on Pederson's (2009) work concerning the efficacy of guided and reflective intercultural pedagogy, we suggest that this is a result of the design of the study abroad

experience (i.e., the program, instructors, and environmental setting) in contrast to an unfacilitated experience of visiting another country. The program that served as the context for our investigation purposely sought to emphasize an understanding of human–environment interactions that encouraged discursive deliberation of concepts in sustainable development.

Beyond conclusions based on the model in general, we made observations about specific relationships between variables within the model. First, similar to attitude and behavior changes described in Bennett's DMIS, the present study abroad experience appeared to strengthen the relationship between the students' altruistic personal values and their EWV. That is, students' values related to equality and social justice more strongly influenced their EWV after their study abroad experience. This finding also provides empirical evidence for Tarrant and Sessions' (2008) assertion that study abroad experiences can allow students to undergo a transformational process in which the ideals of justice-oriented citizenship are promoted.

Another path that appeared only in the postexperience model was from the egoistic dimension of AC to AR. This suggests that after the study abroad experience, the students' perceptions of the impacts of environmental conditions on their health and on the well-being of their future children influenced their attitudes toward their own responsibility regarding environmental problems and solutions. A possible explanation for this observation is that the students were able to use the information they learned to understand the relationships and timelines involved between their actions and impacts on the environment.

An observation that differed from previous findings concerned the motivations of global citizens. Dobson (2003) suggested that global citizens act in response to biospheric, altruistic, and egoistic motivations; however, our observations indicated that only biospheric and egoistic beliefs influenced the students' perceptions of their responsibility toward the environment. This may be because the experience did not foster the observations or experimentation necessary for the students to distill the experiences into new knowledge relating to abstract concepts involving the egoistic—AR relationship. If this hypothesis is true, then our observation indicates an area of needed improvement for this study abroad program; instructors need to utilize alternative and improved pedagogical techniques to intervene in the students' learning to help the students transfer their observations into new knowledge.

Finally, we observed a stronger relationship between students' perceived responsibility for the environment and their personal obligations to reduce their negative impacts on it after their study abroad experience. Based on Dobson's (2003) argument that global citizens accept an obligation to act rather than respond to a sense of duty, this finding provides more support for the idea that VBN theory is useful in understanding the constructs influenced by study abroad programs that promote learning outcomes related to global citizenship.

These findings, along with future research using an adapted VBN model in conjunction with relevant learning theories, may suggest several implications for the design and structure of study abroad programs designed to foster global citizenship.

For example, Shmaefsky and Letargo (2007) suggested that programs foster a social mindset that focuses on a healthy environment, an equitable society, and a strong economy. Our model may accomplish this by providing students with new knowledge that can help them refine the biospheric (i.e., values related to a healthy environment), altruistic (i.e., values related to an equitable society), and egoistic (i.e., values related to the effects of the economy on personal well-being) components of their personal values as well as their EWV. Shmaefsky and Letargo also recommended that programs include an intellectual climate highlighting the role individuals play in designing and creating a sustainable future. Clearly, the study abroad program instructors can set this intellectual tone. Within our model, following this suggestion will inform students' beliefs related to their awareness of the consequences of environmental impacts as well as their perceived responsibility to mitigate these impacts. Shmaefsky and Letargo's last two suggestions involve engaging students with relevant content and allowing them opportunities to engage directly with community members, educators, government officials, and business leaders. In our context, it appears that experiential learning encouraged students to draw their own conclusions about the relationships between their values, beliefs, norms, and behavior. Of course, each group of students and educators is different and specific pedagogical strategies should be tailored to the specific program; however, the above guidelines are congruent with our findings. Hence developing a curriculum with these ideas in mind may foster students' sense of global citizenship.

In conclusion, this investigation utilized VBN theory to understand the constructs influenced by study abroad programs that promote learning outcomes related to global citizenship. In doing so, we have provided empirical support for the efficacy of short-term study abroad programs. Furthermore, considering our observations of the relationships among the constructs used in the VBN theory in light of several learning theories (ELT, TLT, and DMIS), we have developed further support for the importance of strong pedagogical techniques implemented by competent instructors. In other words, study abroad participants can develop a sense of global citizenship through short-term programs. However for that to happen, educators must play a role in the students' learning.

## Declaration of Conflicting Interests

## Funding

## Notes

1. Empirical support for this conceptualization can be found in Steg et al. (2005) and Stern (1999).

2. The parallels between global citizenship and Dobson's concept of and earth citizen are supported by several authors (e.g., Shallcross & Robinson, 2006; Winn, 2006).

3. Each variable in the VBN framework relates directly to the adjacent variables, and may relate directly to subsequent variables in the process.

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