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Gauging the impact of study abroad: how to overcome the limitations of a single-cell design

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Criterion and construct validation analyses support the use of both retrospective questions *in lieu* of a pretest and a methodological innovation to compensate for the absence of a control group in a program evaluation that calls for an unavailable experimental design. The findings obtained with this method present evidence that study abroad programs have a very positive impact on US university students.

International educators at either side of the Atlantic have long recognized that college students returning from studying abroad show positive changes. Rather impressionistically, US educators report that their students return with an enhanced concern about international affairs, are more appreciative of different cultures than before they left their home campuses, and are more mature, self-aware and independent.

The research literature that evaluates the impact of study abroad on US college students coincides with these impressionistic perceptions and finds that participants in study abroad programs acquire global-mindedness, grow intellectually, and develop personally (Carlson & Widaman, 1988; Carlson *et al.*, 1991; Thomlison, 1991; Cash, 1993; King & Young, 1994; McCabe, 1994; Drews & Meyer, 1996; Hutchins, 1996; Waldbaum, 1996; Bates, 1997; Ybarra, 1997; Zhai, 2000).

There is also evidence of second language acquisition gains—especially in listening and comprehension abilities—for students who study abroad in non-English-speaking countries (Parr, 1988; Austin, 1989; Ginsberg, 1992; Ginsberg *et al.*, 1992; Brecht *et al.*, 1993; Brecht & Robinson, 1993; Kline, 1993, 1998; Iino, 1996; Rivers, 1998, Jones & Bond, 2000). With few exceptions, for example Opper *et al.* (1990), however, study abroad program evaluations in terms of academic impacts (other than linguistic

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ones) have not been dealt with extensively in the research literature on gains from studying abroad.

An important problem encountered by program evaluation projects in general is that they often must contend with their subjects' maturation. In the particular case of university programs, educators appreciate the dramatic transformation that *traditional age* students undergo in the relatively short span they are in college. This transformation is particularly noticeable in the transition from the second ('sophomore') to the third ('junior') years, which in the USA coincides with the period during which an increasing number of university students go through the process of preparing for, and then participate in, study abroad.

This maturation context in which study abroad is undertaken, therefore, calls for a program evaluation design that takes into consideration not only changes that take place between before and after studying abroad, but also one which contrasts these changes with those experienced by students who have not studied abroad—the control group. In short, a pretest/post-test, treatment/control group true experimental design is the prescription of choice. The research literature on the impact of study abroad, however, offers a limited number of such experimental designs. Most of the research studies that involve both pretest and post-test measures to capture attitudinal changes among study abroad program participants deal with very small samples, and are thus barely able to account for changes that are statistically significant. Thus, Price and Hensley (1978), with a sample of 18 Kent State University students who attended a semester in Switzerland, found a slight increase in interest in international affairs and career aspirations. Bates (1997) interviewed 14 Lander University (South Carolina) students who participated in an honor program in the UK and a control group of 65 students who stayed home. Her findings suggest that those who participated in the study abroad program showed personal development as well as an increase in their world-mindedness. Hutchins (1996) did a qualitative study about the impact of a study tour abroad on six Ohio State University graduate students and found that it had an effect on their international perspective. Also at Ohio State University, Zhai (2000) found no statistically significant changes in the global perspective of 21 students from the College of Food, Agricultural, and Environmental Sciences who participated in study abroad programs. Carlson *et al.* (1991), on the other hand, is the most comprehensive of these experimental design evaluation studies, with a sample of 488 junior students who studied in France, Germany, Sweden and the UK, and a control sample of 157 juniors who stayed on campus at their home institutions during the same period.

As is the case with non-participants in other college programs, it is a major challenge to obtain a sizeable control group of students who have not participated in study abroad. A major difficulty is to obtain responses from these students, since they have little incentive to participate in a research project whose focus is not one of their interests. Deception is, of course, out of the question: not only is it unethical, but institutional review board guidelines specifically preclude deceiving subjects about the topic of the research project in which they are asked to participate. An alternative to enlist a control group specifically to contrast it with

program participants is to include the same questions that are posed to program participants in an omnibus questionnaire, administered by a college or university institutional research office to a cross-section of the student body in general, or just to the *junior* class. The latter is the most typical source of control groups in study abroad research.

A comparison between study abroad program participants and a cross-section of the general student population that stays home, however, involves equating unmatched groups.[1] Students interested in studying abroad constitute a selective population. They are more interested than the rest of the student body in widening their horizons concerning international issues—even before they study abroad. In this sense, they should be matched with students who are equally predisposed toward international affairs but who have not participated in a study abroad program. The design for our evaluation project utilized a list of every student who *applied* and was admitted into study abroad through the New Jersey State Consortium for International Studies,[2] and who intended to depart anytime between Fall 1997 and Summer 2002 (both included). Since quite a few of these applicants ended up not following up with our studying abroad programs, we originally planned to rely on these applicants who withdrew from the study abroad program before departing abroad as our control group. Because some of these non-participants may have studied abroad through venues other than the New Jersey Consortium, the questionnaire specifically asked these individuals if they studied abroad anyway. The response rate for these non-participants, however, was appallingly low. In the end, we got back questionnaires from just three very kind respondents who did not study abroad at all. This very small group of respondents could not possibly constitute a control group and, thus, we were forced to dispose of their data (and, with that, of our control group).

In order to assess any changes introduced by studying abroad (the 'treatment'), an evaluation of its impact calls for testing relevant *outcome* variables both before and after students study abroad. In many instances, however, program evaluation is an afterthought to an ongoing program undertaken by extremely busy program administrators. This is especially true in study abroad program offices that have a small staff, a situation shared by the New Jersey State Consortium for International Studies. Once the questionnaire is developed, however, it becomes easier to implement the routine of having each applicant respond to it. The issue, though, is whether it is worth to analyze the data available, coming from a sizeable amount of students who have returned from their studies abroad.[3] This analysis would also help us to fine-tune the evaluation questionnaire to be used for pretest/post-test evaluation studies in the future.

Despite both our lack of a pretest and our virtually non-existent control group, we managed to overcome these limitations. The purpose of this article is to report how we compensated for the shortcomings of a *single-cell* design. Instead of a pretest, we used retrospective questioning that evoked the respondents' state of mind at the time of their application to study abroad. Furthermore, instead of a control group to assess the possible influence of our subjects' maturation, we were able to reconstruct the age

each respondent was at the time she or he applied to study abroad—and compared younger with older applicants in terms of their retrospective, 'pretest' responses.[4]

The first section of this article dwells on the methodology of the project. The second section reports on the changes between the retrospective 'pretest' and current time responses. The third section assesses the possible effects of the subjects' maturation. Finally, the findings of this project are compared to those of known results from true experimental designs. In the end, our findings based on a retrospective 'pretest' and in a comparison between younger and older students turned out to be highly consistent with those obtained by research projects based on a true experimental design.

Methodology

Students who applied and were admitted to study abroad through the New Jersey State Consortium for International Studies between Fall 1997 and Summer 2002 were asked to reply to an online questionnaire about studying abroad. About 200 students from The College of New Jersey were contacted by email for this purpose, as were 36 students from Rowan University. In addition, 536 randomly selected study abroad applicants were mailed a letter asking them to reply to the questionnaire online.

In total, we were left with 95 usable questionnaires: we were forced to discard two questionnaires erroneously filled out by students who were then studying abroad; we also discarded three questionnaires sent by our intended control group of students who never studied abroad.[5] The units of analysis are, therefore, study abroad program participants. Taking into account the letters returned because the addressees were unreachable, as well as by not counting as part of the sample frame those applicants who withdrew from the program, the response rate amounted to approximately 20%. Due to budgetary restrictions, there was no follow-up mailing. So as not to add a possible bias, there was no follow-up emailing either.

Substituting for a pretest

In the absence of a pretest, we decided to elicit retrospectively our respondents' state of mind around the time they applied to study abroad concerning their interest in international issues; fluency in languages other than English; exposure to other countries' cultural expressions; attitudes toward speakers of other languages, toward disparities between rich and poor countries, and toward the United Nations; familiarity with the countries they were planning to sojourn in, etc. In the second section of the questionnaire, we posed the same questions in the present tense—referring to the time they were answering the questionnaire. Thus, the series of retrospective questions were preceded with the statement: 'Now, please think back to the time before you applied to study abroad. Keep this period in mind while you answer the following questions.' This same period of time was reinforced two-thirds of the time into the retrospective section, when asking more personal questions about the respondents, such as their degree of agreement with items about their being

independent, outgoing, friendly to people of other countries, etc. This subsection was introduced by the statement 'We would like to ask you a few questions that will help us understand you as a person at the time you were applying to study abroad.'

The section of the questionnaire dealing with the respondents' current state of mind was introduced with the statement 'Now please answer the following questions as they apply to the present time.' Again, when posing the more personal items toward the end of the present time section, the time reference was reinforced by the statement 'We would now like to ask you some questions about you, as an individual, as you see yourself at the present time.'

The final section of the questionnaire poses questions that allow the respondents to evaluate how much they have changed as a consequence of their study abroad experience. The idea was to use these items for a construct validation for the retrospectively designed 'pretesting.' Still, the differences encountered between the retrospective 'pretest' and the post-test would be contrasted, where comparable, to the *true* before/after differences found in the existing research literature. Such comparisons, to be included in the last section of this article, will be the basis for a criterion validation of our suggested retrospective substitution for a pretest. These comparisons will also help to validate our control for maturation based on the contrast between younger and older applicants to study abroad.

I do not mean to imply that a substitute for pretesting through the use of retrospective questions is always advisable. One can never trust memory too much. This technique lends itself, rather, to situations where episodes in a person's life become extremely important to them, to the point that respondents are able to reconstruct their personal state of mind prior to such episodes. Ideally, these should be episodes or events that leave an imprint in a person's life—such that they can find anchors in their memories and can thus think of themselves before and after these events. Studying abroad is, I submit, one such type of event. My experience as study abroad advisor has taught me that, almost without exception, every student I have interviewed upon their return from abroad has expressed the opinion that the experience of sojourning in another country has been the most meaningful and rewarding one in their lives so far. Furthermore, both the experiences of having undergone culture shock a short time after arrival in their host country, and, for many, reverse culture shock upon returning to the USA, has triggered a good deal of self-reflection for the vast majority of these students. These processes of self-reflection are excellent mechanisms to help to evoke one's state of mind before being exposed to the study abroad experience. It could certainly be argued that such a defining episode in the life of a person may lead respondents to overstate the disparities between their 'pretest' and post-test responses—either by presenting themselves as unsophisticated at the time of application to study abroad or by exaggerating their cosmopolitanism at the present time. However, I have several reasons to believe that the respondents are not exaggerating their changes between the retrospectively constructed 'pretest' and the current time post-test: (1) there are many questions in each set and it is therefore difficult to remember the exact response given to each one of the 'pre-test' items; (2) although there are no impediments to returning to the beginning of the online

questionnaire to check the response one has given to an earlier question, doing so for each and every question is very cumbersome; (3) I have interviewed every student I sent abroad both before and after their sojourn abroad and in most cases I could sense impressive changes in them—they came back more self-confident, cosmopolitan, reflective and independent-minded. As we show in the criterion validation section below, our findings are consistent with those of researchers who conducted true experiments.

Compensating for the lack of a control group

The failure to attract enough respondents who did not study abroad left us without a control group. This meant a serious blow to our attempt to isolate the effect of studying abroad from other possible factors. Chief among such extraneous factors is the very process of growing up—the sophistication that comes with maturation. If age were such an alternative determinant factor of the kind of differences attributable to the experience of studying abroad, therefore, it would be possible to show that age makes a difference when controlling for studying abroad. Certainly, our sample lacks respondents who have not studied abroad. Nonetheless, if we rely on the assumption that retrospective substitutes for a pretest are valid indicators of the respondents' state of mind prior to their having studied abroad, we can compare the retrospective responses of younger applicants to study abroad with those of older applicants. I was able to reconstruct the age each respondent was at the time of application.[6]

If, on the other hand, maturation were not a relevant factor, it would show no difference between younger and older applicants in terms of their cosmopolitanism, personal growth or other outcomes attributable to the experience of studying abroad—if indeed such differences could be found between the substitute retrospective ('pretest') measures and the outcomes at post-test. Furthermore, such an original association between these hypothetical effects of study abroad would be maintained when controlling for age at application in a multivariate analysis.

The effects of studying abroad

The data in Table 1 show that respondents claim a gain in foreign language fluency. Although this gain in fluency is slight, it is nevertheless statistically significantly at the .001 level. Newspaper readership shows a clear increase. So does the interest in international news, measured on the basis of exposure to either print or the electronic media. Interest in issues discussed in the United Nations, as well as an interest in the disparities between rich and poor countries, shows a dramatic increase as a consequence of the exposure to study abroad.

In terms of the exposure to cultural manifestations of other countries, there is a slight, although statistically significant, increase in the frequency of watching foreign films. This is coupled with an improved disposition to watch subtitled films (in a foreign language). The reading of literature set in other countries has also increased slightly, with a moderate statistical significance—at the 5% level.

Table 1. Mean differences between retrospective 'pretest' and post-test

Variables	'Pre-test'	Post-test	N	Significance
Languages spoken, other than English	1.62	1.84	95	.000
Frequency of newspaper readership	2.83	3.38	95	.000
Interest in international news	3.67	4.14	94	.000
Interest in issues debated in the UN	3.05	3.63	94	.000
Interest in rich/poor countries disparities	3.55	3.99	93	.000
Frequency of watching foreign movies	2.51	2.82	94	.000
Attitude toward subtitled movies	3.33	3.61	93	.002
Feelings about visiting non-English countries	3.28	4.03	95	.000
Reading books set in other countries	3.00	3.16	95	.046
Amount of political information on host country	2.19	1.77	94	.000
Amount of geographical information on host country	1.70	1.29	94	.000
Amount of economic information on host country	2.04	1.70	94	.000
How much is respondent's career planned	2.97	3.61	66	.000
Disposition toward graduate studies	3.21	3.58	67	.012
Frequency of travel within the continental USA	3.12	3.36	91	.008
Frequency of travel abroad	2.01	2.78	94	.000
Friendliness toward people of other countries	4.34	4.55	94	.002
Considering oneself outgoing	4.10	4.28	94	.003
Considering oneself independent	4.41	4.64	92	.002

Note. Frequencies, interests and attitudes are coded as 1 = low to 5 = high. Amount of information is coded as 1 = a lot; 2 = some; 3 = no information.

Regardless of the language spoken in the host country, respondents feel more confident now about traveling to non-English-speaking countries. They have also increased the frequency with which they travel—both domestically and internationally. Respondents also feel personally more independent, outgoing and friendly toward people from other countries. Also on a personal level, career plans show more clarity after studying abroad. Plans for graduate studies seem to have made an inroad as a consequence of study abroad—although statistical significance is moderate, at the 5% level.

Respondents tend to claim to having had substantial geographic information about their intended host country prior to studying abroad. Yet they also register a decisive knowledge improvement in this area as a consequence of having sojourned in their host countries. Their reported acquisition of both political and economic information about their host countries is also quite remarkable.

Controlling for the effect of maturation

In the absence of a control group that could help us to isolate the effect of studying abroad from other life experiences that come with maturation, Table 2 contrasts younger and older respondents' retrospective answers to the same questions depicted in Table 1—that is, as applicable at the time of their application to study abroad.

Table 2. Mean differences between younger and older applicants to study abroad

Variables	Age 19–20	N	Age 21–24	N	Signif.
Languages spoken, other than English	1.60	43	1.60	45	.976
Frequency of newspaper readership	2.84	43	2.67	45	.402
Interest in international news	3.49	43	3.80	45	.200
Interest in issues debated in the UN	2.84	43	3.14	45	.093
Interest in rich/poor countries disparities	3.44	43	3.76	45	.115
Frequency of watching foreign movies	2.35	43	2.73	45	.079
Attitude toward subtitled movies	3.10	41	3.62	45	.045
Feelings about visiting non-English countries	3.12	43	3.42	45	.178
Reading books set in other countries	2.86	43	3.16	45	.230
Amount of political information on host country	2.37	43	2.07	45	.018
Amount of geographical information on host country	1.81	43	1.64	45	.174
Amount of economic information on host country	2.09	43	2.00	45	.462
How much is respondent's career planned	3.10	42	2.93	45	.556
Disposition toward graduate studies	3.33	42	3.22	45	.674
Frequency of travel within the continental USA	3.09	43	3.11	45	.916
Frequency of travel abroad	1.91	43	2.13	45	.352
Friendliness toward people of other countries	4.28	43	4.42	45	.360
Considering oneself outgoing	4.26	43	3.98	45	.154
Considering oneself independent	4.38	42	4.40	45	.918

With the exception of the attitudes toward subtitled films, and the amount of political information about the host country, the differences between younger (19 and 20 years) and older (21 through 24 years) applicants show no statistical significance. Maturity does show a slight improvement to the disposition to watch subtitled films as well as a slight improvement in the amount of political information about the host country. In both instances, statistical significance is moderate, at the 5% level. Although our experience indicates that the transition between the second and third year of university brings about a noticeable maturation to traditional age students, the data in Table 2 show small differences between younger and older students. The fact that age does not explain the variance in different dimensions of world-mindedness is not surprising, considering the localist culture embraced by the student body catered to by the New Jersey Consortium.

We can therefore conclude that the differences registered in Table 1, between the reconstructed, retrospective 'pretest' and the post-test measurements are genuinely due to the respondents having gone through the experience of studying abroad. Thus, they have become more cosmopolitan, acquired more knowledge about their host societies, and grown personally as a result of their having participated in study abroad.

Another way we can control for the possible effect of maturation on the apparent impact of studying abroad is to analyze the differences between the retrospective 'pretest' and the post-test measurements when controlling for age. Table 3 enables us to see the possible effects of each one of these variables simultaneously. Rather than

Table 3. Mean differences between retrospective 'pretest' and post-test, by age

	19–20 years old			21–24 years old		
Variables	Before	After	Signif.	Before	After	Signif.
Languages spoken, other than English	1.60	1.74	.110	1.60	1.87	.004
Frequency of newspaper readership	2.84	3.30	.000	2.67	3.31	.000
Interest in international news	3.49	4.14	.000	3.80	4.07	.004
Interest in issues debated in the UN	2.84	3.63	.000	3.14	3.55	.002
Interest in rich/poor countries disparities	3.44	4.00	.000	3.73	4.02	.005
Frequency of watching foreign movies	2.38	2.67	.012	2.73	3.04	.018
Attitude toward subtitled movies	3.10	3.32	.083	3.62	3.96	.024
Feelings about visiting non-English countries	3.12	4.02	.000	3.42	4.09	.000
Reading books set in other countries	2.86	3.05	.103	3.16	3.31	.212
Amount of political information on host country	2.37	1.70	.000	2.07	1.87	.083
Amount of geographical information on host country	1.81	1.21	.000	1.64	1.38	.013
Amount of economic information on host country	2.09	1.53	.000	2.00	1.87	.183
How much is respondent's career planned	2.97	3.56	.006	3.03	3.69	.002
Disposition toward graduate studies	3.19	3.50	.186	3.27	3.76	.013
Frequency of travel within the continental USA	3.10	3.34	.058	3.11	3.36	.054
Frequency of travel abroad	1.93	2.76	.000	2.13	2.87	.000
Friendliness toward people of other countries	4.28	4.47	.118	4.42	4.64	.003
Considering oneself outgoing	4.26	4.37	.168	3.98	4.20	.011
Considering oneself independent	4.38	4.74	.006	4.40	4.53	.160
	N=43	N=43		N=45	N=45	

indicating spuriousness in the relation between the experience of studying abroad and an increase of cosmopolitanism, personal growth, and knowledge about the specific host society one has sojourned in, controlling for age reveals some interesting specifications. In some cases, furthermore, the absence of statistical significance may be inconclusive—the result of a drastic reduction in the size of the sample size from about 95 to about 43.

The effect of studying abroad on foreign language acquisition is more noticeable among the older program participants than among the younger ones. Indeed, the

mean difference among those aged 19 and 20 appears to be statistically insignificant. Newspaper readership increases with study abroad, regardless of the participant's age. The same can be said of world-mindedness, as expressed by an interest in international news, interest in issues debated in the United Nations, and interest in the disparities between rich and poor countries. Exposure to the cultural manifestations of other countries is mixed: whereas the frequency of watching foreign films increases with study abroad, regardless of age, the attitude toward subtitled films improves only among older participants. Reading of literature set in other countries, which was statistically significant, though merely at the 5% level, in Table 1, shows its statistical significance compromised in Table 3, where the independent sample sizes are reduced to less than half the size of Table 1.

Younger study abroad participants register a more thorough gain of information about their host countries than their older counterparts. This is not only due to the fact that younger participants started off with less information than older participants. Younger participants also report acquiring more information, overall, about their host societies than their older counterparts. Given the reduction of sample sizes, statistical significance in the difference between earlier information and the current one remains unaltered among young participants but appears to be compromised concerning political and economic issues among older participants.

Personal growth as a consequence of studying abroad varies by age. Independence increases only among the younger study abroad participants, whereas the presentation of self to others ('friendliness' as well as being 'outgoing') has a more clear effect among the older study abroad participants. Career planning clarity is gained by all study abroad participants, regardless of age, whereas a favorable disposition toward graduate studies is gained predominantly by older participants.

Finally, participants of study abroad programs will travel more—regardless of age—especially abroad. They will also venture to do so to countries where English is not the first language.

Validation of the retrospective substitute for pretesting

The last section of the questionnaire poses a series of questions that allow the respondents to reflect on how they have changed—or not—as a result of having studied abroad. In themselves, these subjective appreciations of change may be questionable from the perspective of validity. However, they are useful referents to correlate with changes between the retrospective substitutes for pretesting and their corresponding post-test outcome measures. Briefly, these subjective notions of change can help us to assess a *construct* validation of those retrospective substitutes for pretesting.

There are two areas of change between the retrospective substitute 'pretest' and post-test that can be compared to the questions about the subjective evaluations of change. The first of these areas refers to the independence manifested by the subjects, as part of their personal growth. The second area refers to gains in the subjects' world-mindedness.

Table 4. Construct validation of independence changes

Learned to make own decisions	Perceived change					Unchanged				
Questions #30 and #56	Mean	N	SD	t	Sig.	Mean	N	SD	t	Sig.
Thought of myself as independent person	4.33	72	.888			4.67	18	.594		
Think of myself as independent person	4.64	72	.484	−3.578	.001	4.67	18	.594	.000	1.000

Table 5. Construct validation of world mindedness

Deepened interest in world affairs	Perceived change					Unchanged				
'Pre' and post interest in international news	Mean	N	SD	t	Sig	Mean	N	SD	t	Sig.
Was interested in international news	3.66	83	1.129			3.56	9	1.130		
Is interested in international news	4.17	83	.935	−5.188	.000	3.78	9	1.302	−1.512	.169

In order to validate the measurement of change between the substitute for pretesting and the post-test in both areas, I have combined the response categories 'very much in agreement' and 'agreement' to each of the subjective question and labeled the combined category as 'perceived change.' All the other responses (neutral, in disagreement, and very much in disagreement) now constitute the category 'no change perceived.' For each of these categories of perceived change, I will do an analysis of paired sample means, contrasting the retrospective 'pretest' mean with the post-test one. If the retrospective substitutes for pretesting were valid, I should find statistically significant means differences between the 'pretest' and the post-test outcome measures, but only among the respondents who perceive changes as a result of their experience of studying abroad.

Question #72, 'The experience of studying abroad has taught me to make my own decisions,' an indicator of gained independence, is matched in Table 4 to the dyad of questions #30 and #56, 'I thought of myself as an independent person' and 'I think of myself as an independent person.'

Question #73, 'The experience of studying abroad has deepened my interest in world affairs,' an indicator of gained world-mindedness, is matched in Table 5 to variables constructed on the basis of combining questions 9g and 10g, on one hand, and the combination of questions 35g and 36g, on the other hand. Thus, the retrospective substitute for a 'pretest' of interest in international news rests on questions 9g and 10g: 'What type of news did you read in newspapers by the time you applied to study abroad? For each type of news indicate your level of preference, where '1' means 'Low' and '5' means 'High' and 'When watching news, what did you

focus on? For each type of news indicate your level of preference, where '1' means 'Low' and '5' means 'High'.' Questions 35g and 36g are combined as the post-test of current interest in international news: 'What kind of news do you prefer to read about? For each type of news indicate your level of preference, where '1' means 'Low' and '5' means 'High' and 'When watching the news, what do you focus on? For each type of news indicate your level of preference, where '1' means 'Low' and '5' means 'High'. There are different kinds of news included in questions 9, 10, 35, and 36. Item 'g' in each one of these questions refers to international issues.

In both Table 4 and Table 5, the respondents who (subjectively) express the view that they have changed as a result of their experience of having studied abroad also register changes between the retrospective substitutes for pretest and post-test measures. These tables also show that there is no change between the retrospective substitutes for pretest and the post-test outcome measures among respondents who perceive themselves as not having changed as a result of having studied abroad.

The data show that respondents who perceive that they have changed as a result of the experience of studying abroad do register changes between retrospective substitutes for pretest and post-test indicators of world-mindedness and independence. These construct validation findings alone cannot confirm the validity of our retrospective substitutes for pretesting. Yet, most important, these findings suggest that we cannot reject such validity either. Therefore, we can rely on existing research that has analyzed the impact of studying abroad on some of the outcome variables also addressed by our own study.

Since the research literature on study abroad reports findings involving similar outcome variables to the ones gauged in our study, we can compare our findings to the former as a criterion basis to validate the retrospective substitutes for pretesting. This comparison will also help to determine the extent to which our use of the variable 'age at application' can help to substitute for the absence of a control group.

As expressed above, the study by Carlson *et al.* (1991) is the most comprehensive of those involving pre- and post-test measurement of outcome variables. Its 488 undergraduate respondents are from the University of California, University of Colorado at Boulder, University of Massachusetts at Amherst and Kalamazoo College. They studied in France, Germany, Sweden and the UK. They are contrasted with a sample of 157 from the same institutions who did not study abroad. The findings show that the students who studied abroad registered a significantly greater interest in international affairs after their sojourn abroad. Although students who stayed home during their junior year also showed an increase in their international interest, the increase was far superior among those who studied abroad. The researchers also point out that the knowledge of host societies by study abroad participants prior to their sojourn abroad was from poor to moderate. However, their knowledge increased dramatically as a result of their experience in the host countries.

Our findings, based on a comparison between a post-test and retrospective questions substituting for a pretest are consistent with those found by research projects involving comparisons between post-tests and *real* pretests. As shown

in Tables 1 and 3, New Jersey Consortium students registered increases in their world-mindedness, as expressed in their increased interest in international news, increased interest in what is debated in the United Nations, and increased concern about the disparities between rich and poor countries. With the exception of Zhia's (2000) study, based on an extremely small sample, all others found the exact same pattern.

Carlson *et al.* (1991), having found that the increase in world-mindedness is explained in great measure by the impact of study abroad, are also able to identify maturation as a factor that accounts for part of the increase. Our findings (see Tables 2 and 3) indicate that age does not explain the perceived increase in world-mindedness. The apparent discrepancy with the Carlson *et al.* (1991) study may be due to either or both of the following factors: (a) maturation involves more than becoming older; and (b) the undergraduate student population at major research institutions such as those where the Carlson *et al.* (1991) study was undertaken differs markedly from students attending the predominantly teaching universities and colleges that are served by the New Jersey Consortium. There are no accurate quantitative data to compare internationalization of US campuses. However, there are good data about participation in study abroad which can be used as a proxy of internationalization. Most member institutions of the New Jersey Consortium belong in Carnegie's Master I institution type. According to the 2002 Open Doors survey on international education participation, the average participation in study abroad by students in these institutions amounted to 8.20%. MA II institutions recorded an average participation of 12.84%; Research I institutions' participation was 11.44%; and Research II institutions' participation was 11.49%. The institutions covered by the Carlson study are consistently high in study abroad participation: University of Colorado at Boulder=15.5%; University of Massachusetts at Amherst=14.8%; Kalamazoo College=106%; the University of California campuses vary from Davis=3.8% to UCSD=16% (I suspect that the overcentralized study abroad operation of the entire UC system does not count students who participate in programs run by other institutions). Study abroad participation by New Jersey State Consortium for International Studies students is as follows: William Paterson University, 2%; Rowan University, 2.2%; Montclair State University, 5.5%; The College of New Jersey, 6.4%. There are no Open Doors data for the other three New Jersey Consortium institutions.[7]

Whereas the age component of maturation is crucial, the very exposure to further university education, as well as the contact with returning study abroad students may account for the slight increase in world-mindedness gauged by the Carlson study among students who stayed home. Furthermore, the internationalization of the campus at research universities is probably a key factor in the enhancement of some degree of world-mindedness among those students who, for whatever reason, do not study abroad. Academic staff and administration at teaching institutions have also made sustained efforts—in varying degree—to internationalize their campus and curriculum. However, where institutions tend to cater to first-generation university students—as it happens in the teaching institutions of the New Jersey State

Consortium for International Studies—the educators' efforts have not translated so easily in the adoption of an international orientation by the student body as a whole. Insofar as age maturation shows no impact in this respect, I am therefore inclined to assume that most, if not all, of the gain in world-mindedness experienced by the students who have participated in study abroad programs is due to their experience of having studied abroad.

Summary and conclusions

The experience of studying abroad has a very positive impact on university students, as shown by our survey of participants in the programs run by the New Jersey State Consortium for International Studies from Fall 1997 to Summer 2002. Alumni from these programs have returned more worldly than before, are more interested in international affairs, read newspapers more often than before going abroad, increase their fluency in other languages, acquire a more solid knowledge about their host countries' societies and cultural manifestations, and also show definite signs of personal development: they are more independent, more outgoing, more friendly toward people from other countries, more self-assured and uninhibited about traveling to countries where English is not the first language.

This evaluation study relied on retrospective questions that substitute for a pretest. We measured the changes brought about by studying abroad by comparing how the students fared in outcome variables at the time they applied to study abroad (the 'pretest') with the same variables at the time they filled out the questionnaire (post-test). The assumption that the retrospective measurements are adequate substitutes for a pretest is based on both criterion and construct validation. As criterion validation of the retrospective substitutes for pretesting, the results of our pretest/post-test differences are contrasted with comparable findings of other researchers—and, especially, with those from the comprehensive, true experimental design study on the impact of study abroad by Carlson *et al.* (1991). A construct validation contrasts changes between the 'pretest' and post-test in our study with the degree of change in comparable areas, perceived by the respondents as due to their having studied abroad. Both validation analyses support our assumption that these retrospective questions are acceptable substitutes for a real pretest in the context of study abroad program evaluation.

In lieu of contrasting our treatment group (those who studied abroad) with a control group of fellow students who have not studied abroad, I have attempted to control for maturation of the study's subjects by conducting an independent sample means difference analysis between younger and older study abroad applicants in terms of the same outcome variables for which I found changes between before and after the subjects studied abroad. In this case, though, the comparison between younger and older (at time of application) study abroad students entailed their 'pretest' retrospective measures only—so as to control for the effect of studying abroad and thus to isolate the net effect of age maturation. As expected, the comparison between younger and older students in terms of their world-mindedness,

information about their host societies, and personal growth showed no statistical significance. Furthermore, these changes are maintained or specified in multivariate paired means difference analyses controlling for age at application to study abroad. This helps us to infer that it is the experience of studying abroad what explains the positive changes in world-mindedness and personal development.

The criterion validation analysis utilized to test the assumption about the adequacy of using retrospective questions as a substitute for a pretest can be useful to attempt to validate the use of age at application to study abroad as a control for maturation. This comparison with the work of Carlson *et al.* (1991), however, shows a disparity between our results and theirs. Whereas we find that age does not appear to determine any of the changes brought about by studying abroad, the Carlson study indicates that a slight magnitude of change—although not as dramatic as that registered as a consequence of studying abroad—is detected in the comparison between their treatment and control groups. This disparity, however, does not invalidate entirely our use of age as a proxy for maturation. I have reason to believe that the type of schools in which Carlson's and our study, respectively, have been conducted may explain that our results differ from theirs. This assumption, though, is not conclusive. It is quite possible that dimensions of maturation other than age are also relevant in the context of the teaching, predominantly first-generation universities from which our project gathered its data. This point will need further research on the maturation of the 'junior' college class in these institutions.

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Notes

1 Matching treatment and control groups is not necessary if we can randomly assign subjects to one or the other group. However, randomization is not an option in the context of programs that students choose voluntarily.

2 The New Jersey State Consortium for International Studies was founded in 1968 to organize study abroad and student exchange programs for the students of its member institutions: Kean University, Montclair State University, New Jersey City University, The College of New Jersey, Richard Stockton College of New Jersey, Rowan University and William Paterson University.

3 This project was also meant as a graduate Research Methods course hands-on training.

4 The use of inverted commas around 'pretest' signifies that this was a *substitute* for a pretest.

5 Eight students (8.4%) studied abroad through programs other than those of the New Jersey State Consortium for International Studies. They were counted as part of the treatment group, i.e. as having studied abroad.

6 Age at application is based on the age at last birthday—as of the time the questionnaire was answered, November–December 2002—and the semester prior to the intended departure to study abroad. The deadline for application to study abroad in Summer or Fall is March 15. The deadline for Spring study abroad is the prior October 15.

7 Data by institution were obtained online at http://opendoors.iienetwork.org/?p=25193 (averages by Carnegie institution type were computed by this author).

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