The Youth Leading Environmental Change Project: A Mixed-Method Longitudinal Study across Six Countries

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Abstract

Significant cultural transformations of the kinds that are needed to move our global society toward sustainability require youth to engage in environmental actions. These actions are more than just updating one's personal practice (e.g., recycling). They are "intentional and conscious civic behaviors that are focused on systemic causes of environmental problems and the promotion of environmental sustainability through collective efforts" (Alisat & Riemer, 2015, p. 14). The current study investigated the effectiveness of the Youth Leading Environmental Change (YLEC) program, which fostered such environmental actions in six participating countries. YLEC is an 11-unit evidence-based youth engagement workshop series, with a focus on environmental justice and on building action competence. The study employed a mixed-method longitudinal comparison group design with three follow-ups at 3, 6, and 12 months. Overall, 365 university students from Bangladesh, Canada, Germany, India, Uganda, and the United States participated in either the workshop or comparison group. Sixty-three of the workshop participants participated in semistructured qualitative interviews at the 3-month follow-up. The results suggest that most participants experienced a significant personal transformation both in regard to how they relate to environmental issues and how they perceive themselves as agents of change. Although there was an increase in environmental action in the month immediately following the workshop series, engagement seemed to revert close to baseline levels at the 12-month follow-up for many participants. Implications of the findings for theory and practice are discussed. Key Words: Youth—Environmental action—Environmentalism—Youth engagement—Environmental activism.

> *I used to think that it is always those bigger organizations, those bigger companies … Could be the ones to act, to act for the environment, but I have learned that even me personally, at my lower status, I can be an activist, I can create change.* —Participant from Uganda (UGD17)

Youth Civic Action for Transformative Change

In the face of worrisome human impacts on global climate (IPCC, 2014), there is hope that a global social movement could lead to a cultural transformation resulting in a society that has a more balanced and less exploitative relationship with nature. This

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hope is fed by the encouraging civic actions of individuals, groups, and communities across the world. As in other historical social movements, youth and young adults play a critical role in this current push for social and environmental change (Riemer et al., 2013). Not only do they have a major stake in securing a sustainable society for future generations, but they also have an openness to change, fresh energy, and keen sense for social innovation (de Vreede et al., 2014; Harré et al., 2009). They also tend to face less risk of jeopardizing established structures such as long-term employment and families. In many countries, especially economically developing countries in the global South, youth compose a large portion of the population. Thus, it is important that empirical methods be used to identify optimal ways by which to foster the potential contributions that young people could make to the much-needed cultural transformation.

Currently, however, there is very little empirical evidence available about what types of programs, approaches, and strategies are effective ways of engaging young people in environmental actions (Riemer et al., 2013). Environmental actions are understood as "intentional and conscious civic behaviors that are focused on systemic causes of environmental problems and the promotion of environmental sustainability through collective efforts" (Alisat & Riemer, 2015, p. 14). These range from low-level participatory civic action, such as informing oneself about environmental issues and participating in community events, to highly involved and political leadership actions such as organizing a protest. Actions are differentiated from behaviors related to personal practice, such as recycling, which tend to be more individual-focused and private and often tend to be less conscious (Alisat & Riemer, 2015; Jensen & Schnack, 1997). Most scientific inquiry to date has focused on programs promoting changes in personal practice behaviors or conservation efforts (e.g., cleaning up a forest), especially with younger children (Riemer et al., 2013). Although these individual-level changes are an important part of the needed personal transformation, they are not sufficient for the development of the much-needed larger social movement. For this, environmental actions engaging peers, family members, and the larger community in social change are required (Ockwell et al., 2009). These actions need to be carried out with a certain level of understanding of the systemic and global nature of the causes of environmental degradation and strategies for creating a sustainable society (Riemer et al., 2013).

The multinational Youth Leading Environmental Change (YLEC) project was developed as an evidence-based workshop series fostering exactly these types of civic actions among youth and young adults (16–26 years) (Riemer & Dittmer, 2016, in this issue). In this article, we describe the results of a longitudinal mixed-method study investigating the short-term and intermediate impacts of YLEC on university students in six countries. We first provide a brief description of YLEC followed by an overview of the methodology.

Youth Leading Environmental Change

Youth Leading Environmental Change (YLEC) is an environmental youth engagement workshop series developed collaboratively by a group of researchers, representatives of environmental organizations, and young environmental leaders in Bangladesh, Canada, Germany, India, Uganda, and the United States. A detailed description of the rationale for YLEC can be found in Riemer and Dittmer (2016, in this issue), and the theory of engagement underlying the series is described in detail in Hickman et al. (2016, in this issue). Here we focus on the main features of the series.

The YLEC theory of engagement (Hickman et al., 2016, in this issue) is informed by the literature on youth engagement in civic actions (Riemer et al., 2013; see also Pancer, 2015, for a comprehensive review), on individual behavior change (Riemer et al., 2005), and on collective action (e.g., Jensen & Schnack, 1997; Lubell, 2002) as well as prior research by some of the investigators who contributed to the current study. The theory assumes that the presence of several facilitating factors will interact in complex ways to foster youth engagement in environmentally focused civic action (Hickman et al., 2016, in this issue). A comprehension of the complexity and systematic nature of the issues (e.g., the connections between global climate change and social justice) as well as motivation to act driven by a sense of empathy and compassion—as compared to extrinsic incentives and self-interest—will result in intentions for civic actions targeting social change in addition to personal behavior changes. Because many young people lack the action knowledge and skills for effective civic action, they need to first develop those, ideally through experience and practice (Whelan, 2002). This development will also foster a sense of self-efficacy, the belief that they have the skills or knowledge to act effectively and that individual participation in environmental activism will make a difference (Lubell, 2002), which is another important facilitating factor. Finally, existing opportunities and settings for engagement, such as environmental organizations or clubs, will provide youth with the guidance and social connections and support that will keep them involved long-term.

In order to foster personal transformation in regard to these facilitating factors, the series employs four active program ingredients: (1) fostering systems thinking, (2) encouraging personal reflection, (3) building action competence (i.e., a set of knowledge and skills for collective action), and (4) providing role modeling and support. The whole series was conceptualized within an environmental justice

framework with a specific focus on global climate justice (Hossay, 2006). Examples of concrete implementations of these ingredients include a discussion of the ecological model (Kelly, 1986), which represents different system layers in concentric circles; a guest presentation from a person with personal experience of environmental injustice; a live video exchange between students from an economically developing country dealing with the negative impacts of global climate change and students from a wealthy country in the global North experiencing fewer current impacts of climate change; a reflection journal; a variety of interactive lectures and discussions; and an action project, supported by a representative of an environmental organization, that the participants design and work on over several weeks. Each country-based implementation of the series was peer-facilitated by two young, local environmental leaders and used an open, informal, and participatory format. Each country group was asked to implement each of these components to ensure fidelity with the YLEC model but had flexibility to adjust them and add additional components to fit local conditions and cultural context. More details about the specific implementations and the participants' experience with the series in some of the countries can be found in Sayal et al. (2016, in this issue). A detailed manual for the series is available from the authors upon request (Hickman et al., 2012).

Methodology

The goal of the current study was to investigate the effectiveness of the YLEC series in engaging young people in environmental action over the course of a year following the series. In addition, we wanted to explore more immediate outcomes in order to assess to what degree the workshop series is impacting the students according to the YLEC theory of engagement.

Design

In order to test the effectiveness of the series, we used a comparison-group design with one pretest and three follow-ups, which is one of the strongest quasi-experimental designs when a controlled randomized experiment is not feasible (Shadish et al., 2002). We employed both quantitative and qualitative data collection procedures building on the strength of mixed-methods designs (Creswell & Plano Clark, 2011). Survey data were collected at baseline and 3 (workshop group only), 6, and 12 months following the completion of the workshop. In-depth qualitative interviews were conducted after 3 months with a subsample of workshop participants in each country. In addition to these core data, participants completed a workshop evaluation form during the last session of the series, and peer educators and community partners participated in qualitative interviews about their experience. However, these data are not included in the analyses described in this article.

Research sites

Each country team consisted of at least a university professor (who served as the team leader and main contact to the central team), a community partner, and a youth leader. The youth leader also served as one of the two peer facilitators. In order to increase feasibility of the implementation, the workshop series was organized at the university of the leading research collaborator in each country. It was offered as either a university credit course or as an extracurricular certification course (in Bangladesh and Uganda a certificate from a North American university holds a lot of credit). Each country team was supported by the central team, which was located in Ontario, Canada.

Recruitment

All students who participated in YLEC were invited to also participate in the research. The research study was advertised to comparison group participants using standardized scripts on posters, online campus research recruitment systems, and/or invitations through e-mail. Both workshop and comparison group participants received a small payment (or research credit) for their participation in each phase of the research, with an additional bonus payment for having completed all phases of the research. In all countries, information about the research component of the project was provided to workshop participants by a research assistant, who was supervised by and reported to the central study team in Canada. The course instructors were not informed about which students participated in the research and did not have access to the data until all course grades were final and the data were de-identified. All study procedures were approved by the Wilfrid Laurier University Research Ethics Board.

Data collection

Baseline data were collected using online survey tools (SurveyMonkey) or on paper[1]. At the 3-month follow-up, in-person interviews were conducted by a trained research assistant or the principal investigator in Bangladesh, Canada, Germany, and Uganda. Telephone interviews were conducted with participants in the United

[1]Baseline data were collected in person, using paper-copy surveys in Bangladesh, India, the United States, and Uganda and for the German workshop group. Baseline data were collected online in Canada and from the German control group. If data were collected in person, they were collected by the research assistant without the official course instructor or peer facilitators being present.

States and in India. Where in-person interviews were conducted, participants completed the questionnaire on paper; for those participants who were interviewed by telephone, the survey was completed online. For the 6-month and 12-month follow-up assessments, all participants were contacted by e-mail and invited to complete an online version of the survey. In this contact, they were asked if they would prefer to complete the questionnaire on paper, but none of them chose this option.

Study participants

Participants were primarily undergraduate students (in a few cases they were master's-level students) from universities in the respective six countries. Students majored in a variety of disciplines (e.g., psychology, sociology, economics, forestry, geography) across the different countries, depending on which department the series was embedded in. As can be seen in Table 1, there were 131 workshop participants and 234 comparison group participants in this study at baseline with some attrition over time. A missing data analysis did not reveal any systematic drop-out related to any of the core variables in this study. The relatively low numbers at the 3-month time point are due to fact that data were collected as part of the interviews, which only a selected group of the workshop participants were involved in. Of the total sample, 72% ($N = 263$) had at least two data points and were included in the main quantitative analysis. The distribution by country in Table 2 reveals that Germany and the United States struggled with recruiting participants for the workshop series, whereas Bangladesh and the United States had difficulties finding youth for the comparison group[2].

Participant characteristics of the overall sample, of each group, of the sample included in the main multilevel analysis (MLM), and of the interview group can be found in Table 3. These numbers confirm that the MLM subsample and the interview subsample are comparable to the overall sample at baseline. There are some significant baseline differences, however, between the workshop group and the comparison group in regard to age, location of the primary caregivers' home, prior environmental engagement, and community engagement self-efficacy. This is the disadvantage of not using random assignment, which was not possible for this study. Although an attempt was made to recruit similar participants for both groups (e.g., students at similar levels from the same university), given the topic of the workshop series and because participation is voluntary, it was expected that those with prior engagement in environmental issues were more likely to self-select into the workshop group. In anticipation of this, several measures for prior environmental engagement and other key variables were included at the baseline assessment so that these initial differences could be controlled for statistically. In addition, qualitative data were used to find additional evidence for the impact of the workshop series.

Table 1. Sample Size by Wave Including Retention Rate

COUNTRY	TOTAL (%)	WORKSHOP (%)	COMPARISON (%)
Baseline	365 (100)	131 (100)	234 (100)
3 Months	64 (18)	64 (49)	NA
6 Months	238 (65)	91 (69)	147 (63)
12 Months	198 (54)	75 (57)	123 (53)

Measures

To measure engagement in environmental action over time, the 18-item Environmental Actions Scale (Alisat & Riemer, 2015) was administered at baseline and each follow-up. It provides a measure of engagement in environmental actions, including both participatory civic actions (e.g., raising awareness through online tools and participating in community events) and leadership activities (e.g., organizing a petition or boycott). This scale was shown to be both

Table 2. Sample Distribution by Country

COUNTRY	TOTAL	WORKSHOP	COMPARISON
Bangladesh	28	6	22
India	68	43	25
Uganda	63	27	36
Eco. Developing Total	*159*	*76*	*83*
Canada	132	97	35
Germany	69	61	8
United States	5	0	5
Eco. Developed Total	*206*	*158*	*48*
Total	365	234	131

[2]Although the US case study can be considered an implementation failure, rather than dismissing the data from the few US participants, they were included in this cross-country study but not analyzed at the country level.

Table 3. Characteristics of the Sample

CHARACTERISTIC	TOTAL	WORKSHOP	COMPAR.	MLM-WORKSHOP	MLM-COMP.	QUALITATIVE
Size	365	131	234	100	163	63
Age	Avg = 20.68	Avg = 21.57	Avg = 20.18	Avg = 21.67	Avg = 20.11	Avg = 22.00
	sd = 2.53	sd = 2.72	sd = 2.28	sd = 2.42	sd = 2.12	sd = 2.54
Female	236 (64%)	84 (64%)	152 (65%)	64 (64%)	113 (69%)	38 (60%)
Home location						
C = Capital	C = 39 (11%)	C = 30 (23%)	C = 9 (4%)	C = 25 (25%)	C = 6 (4%)	C = 17 (27%)
U = Urban	U = 168 (46%)	U = 54 (42%)	U = 114 (48%)	U = 37 (37%)	U = 86 (53%)	U = 23 (37%)
S = Suburban	S = 81 (22%)	S = 26 (20%)	S = 55 (24%)	S = 22 (22%)	S = 35 (21%)	S = 15 (24%)
R = Rural	R = 75 (21%)	R = 20 (15%)	R = 55 (24%)	R = 16 (16%)	R = 35 (21%)	R = 8 (13%)
Environmental engagement	Avg = 0	Avg = 0.32	Avg = –0.18	Avg = 0.38	Avg = –0.25	Avg = 0.36
	sd = 1	sd = 1.13	sd = 0.87	sd = 1.12	sd = 0.71	sd = 1.08
Community engagement self-efficacy (1–4)	Avg = 2.68	Avg = 2.93	Avg = 2.54	Avg = 2.93	Avg = 2.52	Avg = 2.94
	sd = 0.63	sd = 0.6	sd = 0.6	sd = 0.61	sd = 0.58	sd = 0.57

Note. Avg = Average; sd = standard deviation.

reliable ($\alpha = .92$) and valid on an international sample comparable to the current one (Alisat & Riemer, 2015).

Multiple other measures were included at the baseline assessment. The Environmental Engagement Index is a composite of one question about general interest in environmental issues, five items related to intrinsic motivation to do something for the environment, and self-reported time spent volunteering for environmental causes. The index was created for this study and is standardized to have a mean of 0 and standard deviation of 1. The Community Engagement Self-Efficacy Scale is a nine-item scale ($\alpha = .87$) developed for this study and intended to assess the strength of individuals' beliefs in their own skills and abilities needed to effectively engage in community action, such as communication and leadership skills. Finally, basic demographic information was collected, including age, gender, location of home (i.e., urban or rural), parental education level, and student status. In addition, a dummy variable for developed (= 1) versus developing (= 0) country was created and assigned to each participant.

Analysis

Quantitative and qualitative data were analyzed simultaneously, and then findings were compared and contrasted. Quantitative survey data were first explored in regard to their univariate and bivariate distributions and relationships. Based on this initial data exploration, a formal two-level growth curve model was developed. A multilevel (or hierarchical) analysis allows for the analysis of nested data such as multiple assessments over time nested within an individual participant. It is especially suitable for complex and "messy" applied educational and psychological field studies because it deals well with missing data and allows for the modeling of complex control and predictive variables (Raudenbush & Bryk, 2002). For developing the model, we used the *proc multivariate* procedure of SAS 9.2 (Litell et al., 2006) and followed the modeling steps described by Singer (1998), which include the exploration of the shape of the change over time, the variance-covariance structures at each level of analysis, and the inclusion of a potential control and predictive variables before settling on a final model.

The 63 qualitative interviews were analyzed in a multistage and multirater coding procedure following general principles of qualitative thematic coding (Miles et al., 2013). During the first stage, six members of the research team margin-coded the transcribed interviews in Microsoft Word using in vivo codes. The team then met to compare their codes and discuss differences with the purpose of

creating a general codebook representing all identified codes. The interviews were then imported into NVivo for a second round of coding. Several coders were trained to systematically apply the codes from the codebook to each interview. During the second phase, consensus coding was used initially until consistency and reliability were established. Once it was determined that the coders were able to apply the codes reliably, only one coder was used per interview. In addition, memos were generated for each interviewee and for each country. This process was managed by the project manager and an experienced research assistant. The coded data were then analyzed by different analytical teams to identify specific themes and relationships across themes related to the project's specific research questions (e.g., the experience with YLEC in a specific country). The impact analysis for this article was guided by themes derived from the YLEC theory of engagement as well as emerging themes from the data. For this purpose, a team of six investigators and research staff reviewed coded interviews and memos from all six countries and met on multiple occasions to discuss and synthesize their findings. During this stage, exemplary quotes for specific themes were also identified. As a final step, the first two authors met on two occasions to extract an overall narrative from the identified themes.

Results

The results section is divided into three parts. First, we briefly review some general insights across the six countries in regard to how the different components of the workshop series worked together to impact participants. Second, we describe the transformational shift toward engaging with environmentalism that the participants experienced during and immediately following the series. Finally, we report the results in regard to the impacts of YLEC on environmental actions.

How did YLEC work?

It is beyond the scope of this article to provide a detailed analysis of how the workshop series created the impacts reported in this article. In fact, it is more appropriate to explore this within each specific country context because those effects differed based on the specific cultural context, the type of students who participated, and the quality with which different components were implemented. Some of these analyses can be found in Sayal et al. (2016, in this issue). However, there are a few general insights that are worth reporting here. These are related to the composition of multiple active ingredients, the quality of implementation, and the course format.

When targeting a diverse group of youth from different cultural backgrounds with different levels of prior environmental engagement, it is unlikely that there is one factor or one program component that will stand out as the single most important active ingredient. This was confirmed by the analysis of the interviews with participants. In fact, what became clear is that one key to the success of the YLEC workshop series is the combination of multiple components, which provides flexibility to meet participants at their individual level of development. For example, if some participants were already pretty motivated to take action, they tended to benefit most from the action project because it provided them with the needed action competence. Others were most impacted by the environmental justice speaker because it fostered a deeper emotional connection to environmental issues, which in turn created motivation to act. Those participants were then able to immediately turn their motivation into action as part of the action project. The action project is the one component that was identified most consistently by participants across all countries as being a very impactful experience, followed in significance by the environmental justice speaker and the international exchange. Although this range of active ingredients and approaches provides the comprehensiveness needed to engage youth at different levels, there can be some limitations for youth who already have a strong connection to environmentalism, as experienced in the German case.

It was noticeable, however, that the way a specific component was implemented greatly impacted participants' experience of it. For example, some countries, such as Germany and the United States, struggled to find an appropriate environmental justice speaker who could speak about his or her own personal experience of environmental injustice. Not surprisingly, the participants in those countries reported much less impact from this component compared to other countries (e.g., Canada), which implemented this component exactly as expected based on the YLEC manual.

Another important finding across countries was the impact of the format of the workshop series. Most participants commented on how the open, informal, participatory, and action-oriented nature of the workshop series created an atmosphere of community, mutual trust, and engagement that enabled the participants to feel comfortable to critically reflect on their own personal connection to the environment and experience a sense of empowerment and collective efficacy. Our analyses strongly suggest that the positive impact of individual program components cannot be separated from this fertile ground the course format created, as expressed by this Canadian participant:

> I think my favourite part of the course itself, not just the environmental stuff, was the fact that it was so casual and we had discussion groups and we had nicknames. It was very personal, like it created that whole sense of community. I don't know, I feel

like the people are more likely to make change and care more when you know each other's names. (CAN02)

Overall, our analyses of the interviews confirmed that the combined focus on critical reflection, systems thinking, practical knowledge, skills, emotional connections to justice and fairness, and practical experience as effective change agents together result in a critical personal transformation, which we will describe next.

Personal transformational shift

Throughout the interviews, participants described how they experienced a significant and multifaceted personal transformation as a result of participating in the workshop series. This transformation occurred both in regard to how they relate to environmental issues and how they perceive themselves as environmental actors. Although some of these changes are likely to be only short-lived without any additional reinforcement, other changes seem to be more fundamental and, therefore, enduring.

Relationship to environmental issues. Most participants discussed how immediately following the workshop series they felt an *increased sense of importance* in regard to environmental issues. This was especially true for those students whose studies did not primarily focus on environmental topics, such as students in psychology, economics, or sociology. They described that they had had a general sense that environmental issues are important, but it was something that was more in the background and not very conscious. After the workshop, however, environmental issues had moved to the foreground for them.

> I guess it's made me more sensitive and more aware about environmental issues; like, I don't think I was oblivious to them but now I think I'm more interested and more aware and probably I can spread the word more. (IND07)

Quite a few participants also mentioned how they felt *inspired* by the workshop series to take action and that they felt more *passionate* about environmental issues, as expressed by this Indian student: "I've always felt a certain way about conserving the environment and, if anything, this project has probably fuelled my … I don't know, passion to protect the environment" (IND19). A Canadian participant described a similar transformation:

> I always cared, I noticed, and was like it's too bad they should have a green bin, you know, but now I can't, I can't sit while they don't have a green bin here, I have to go and, and do something, it, it's just, so much stronger the feeling. (CAN20)

Hope for their future and the belief that something can be done was another theme across multiple interviews. Often this was linked to hearing from invited speakers and to the participants' experience as powerful agents in the context of the action project. A Ugandan participant described his transformation in this regard:

> Before I took the course … I really saw most of the things as castles in the air. I didn't feel some of the things would happen, like castles. Building castles in the air. […] But eventually after this course, honestly, it triggered my belief that yes, it can happen due to several experiences I had with people, the testimonies, the practical part where we go in and tried to see. I really saw it was possible. (UGD12)

An *overall perspective change* and a *shift from passive to active* are two types of reported transformations that are likely to have changed the participants long-term. Three major shifts in their perspective were observable in the interviews: (1) from a mostly cognitive connection to environmental issues toward a deeper emotional connection, (2) from environmental issues being somewhat abstract to being very concrete and real, and (3) from viewing environmental issues in a somewhat simple and one-dimensional way to seeing the multiscalar and complex systemic nature of these issues. A German participant, for example, described how the exchange with the Indian students created an emotional connection to the issue:

> The personal accounts they told us about the problems from their daily lives, and family members who are directly affected by some environmental problem, that of course hit closer to home, and, one knew about it, but wasn't so emotionally involved, before. And that really affected me, that video exchange. (GER02)

For many, the personal account of environmental injustice was another key factor in creating an emotional connection to environmental issues. These narratives also made environmental issues, such as environmental justice, more concrete, as is the case for this Canadian participant:

> I think a real life example that kind of, you know, really made me realize it was when Ada came to speak, and her story, the Aamjiwnaang community. So that, it really opened my eyes. I had heard the term [environmental justice] in my global studies classes but it had always been this kind of abstract kind of concept. I had never seen any real life example, and so this drove it home, and affected me. (CAN01)

The following description of environmental justice by an Indian student is an example of the kind of systems thinking that participants began to develop:

> I think that environmental justice is very related to the concept of sustainable development. Like, we have seen in a lot of case studies in the Indian context as well … It's all about environmental justice as well as sustainable development. So there are dams being built—for a reason, for a very good reason, they get water electricity and water diverted to places where water is needed—but at the same time villages are getting drenched. And their voices are also not heard because they are on lower rungs of society economically, is what constitutes environmental justice. (IND10)

Overall, it was noticeable that students in the economically developing countries tended to have an easier time comprehending the complex interconnections of environmental issues with other social issues, especially poverty. They often were able to link corresponding course content with direct or indirect experiences in their own lives.

Although quite a few participants already had been actively engaged in environmental issues (especially in Germany and Uganda), another significant group described experiencing a new shift toward active engagement as a result of their participation in YLEC.

Self-perception as environmental change agents. Interview findings indicated that participants experienced short- and long-term changes in regard to their self-perception as an environmental change agent. This section explores this shift along several dimensions.

Loss of innocence. Many participants described "a loss of innocence" as a consequence of participation in YLEC. That is, they were more conscious and critically reflective of how their actions impact the environment than before. For many this resulted in an increased level of eco-guilt as exemplified in this reflection by a Canadian participant:

> My super ego was just like "no, no, how dare you, you can't get that plastic bag." So, it was kind of annoying sometimes, but, ultimately, I think it was a positive thing and I was happy that it had that effect on me, because it was more, that's more of the person that I wanted to be, right? (CAN20)

From personal to collective. Participants who came into YLEC with little active engagement in environmental issues reported taking action in ways that extended beyond their own personal practice. Almost all reported that YLEC motivated them to speak out about environmental issues to friends, family members, and even strangers both directly and via social media to share information and promote action. These effects were experienced most strongly directly following participation in YLEC modules, particularly the action project. Of the students who reported becoming more active in influencing others, about half were continuing the work of the action projects through conversations (e.g., about reducing water bottle use in Bangladesh) and actions (e.g., building efficient cookstoves in Uganda) that influenced others' environmental knowledge and actions. These efforts to engage more people in discussions about and action for a healthier environment were motivated by a growing sense that mitigating the effects of climate change requires a collective effort. Participants discussed the need for a cultural shift in environmental practices that must extend beyond individuals. For example, an Indian student described how she sees change as "cyclical" in that "I see it beginning with me, my family, then, then you go on to bigger social groups … and then it eventually comes back to affect [me]" (IND20). Likewise, participants' collective viewpoint was evidenced by their emphasis on the importance of involvement from industries, governments, and the international community. In this latter case, nine participants discussed the importance of developing countries taking a key role in the improvement of their own environmental conditions, and 16 participants described the importance of developed countries taking a hand in improving global environmental conditions, in part because of their role in creating these conditions. The youth acknowledged that "when global warming rises, every country, not only ours but also everyone needs to face this problem" (BAN06). The environmental justice framing and the international exchange were attributed as contributors to this shift toward a collective viewpoint of climate change and its solutions.

Collective efficacy. Many participants report experiencing the power of acting as part of a collective. For example, one youth discussed the way the support of the group gave him courage to turn ideas into action:

> If you're doing something with other enthusiastic people and you all share similar values and you have a cause and you're working towards something, chances are that you are going to achieve your goals and have an impact and it's a really rewarding feeling (CAN16)

Most students described how the experience of working together in creating change as part of their action project contributed to their sense of collective self-efficacy.

Identity as an environmental actor. A fundamental shift occurred for many participants, who reported a newly established identity as an environmental actor. This role was frequently associated with a responsibility to act in ways that influence others, as was the case for this participant:

> Once the course ended I wasn't just sitting there like or like "oh the course has now ended and now what next?" I had to go on.

> I had to use the knowledge I've got to share with other people so we can keep the fire burning. (UGD09)

And this participant, who shared how the YLEC workshop series

> really pushed me toward being like an agent of social change … making sure that people are aware of what's happening around the world, informing them that … just kind of giving them the knowledge that this is happening, this is actually a real thing … helping to expand their, their perception of what environmental issues are. (CAN40)

Some participants felt the "fire burning" fiercely in their own lives. One youth described how, after learning about the impact of composting through the action project, "it literally hurts my heart … when I look in the compost and there's [garbage]" (CAN02) and that this emotional response to environmental issues has not only affected her own life but also her relationships:

> I was with this boyfriend who was kind of like, he didn't really care, and even though he'd say that he would care about environmental issues, it just wasn't, he just didn't. And it really hurt me, and we eventually broke up and I felt so much better after, and I felt like I could pursue who I was more. (CAN02)

Participants described their intentions to translate their feelings of identity as environmental change agents into action through further interpersonal influence beyond what they had already done, further education in environmental topics, and seeking environment-related careers.

Empowerment and confidence. Most participants reported that the experience and skills gained through the YLEC series contributed to increased confidence and empowerment to speak out and take action about environmental issues. The action project, in particular, contributed to many participants' sense of self-efficacy to make real change and empowered them to investigate further avenues for action beyond the workshop series. In addition, the general knowledge gained through the workshop modules increased participants' confidence to talk about the issues. Feeling knowledgeable also increased participants' sense of self-efficacy that they would be able to convince others and inspire action.

> I have similar environmental views, like I wanted to make a difference, I wanted to make a change, and I wanted to kind of do something but how much influence I actually have, I didn't realize before. […] Before you are sitting there kind of being the whole "oh, I'm only one person, I can't make a difference," but after doing the project and understanding that your views can be heard by other people and actually acknowledged and accepted, it's a lot easier to kind of bring these views to other people. (CAN46)

For many participants, this personal transformation in regard to the connection to environmental issues and their self-perception as effective change agents translated into environmental action—at least in the short-term—whereas for others it created motivation and intention to act in some future time, which we discuss next.

Impact on environmental actions

The main goal of YLEC was to engage young people in environmental action, that is, conscious and intentional civic actions—such as engaging peers, signing petitions, and organizing community events—targeted at social and environmental change. In the current study, we wanted to investigate whether the carefully designed 11-unit workshop series would result in increased occurrences of environmental actions by the participants up to a year after the completion of the series. In addition, we wanted to explore whether the series impacted the participants' motivation and intentions to engage in such actions in the future.

Impact on action. The impact of the workshop series on environmental action was assessed quantitatively by administering the Environmental Action Scale (Alisat & Riemer, 2015) at baseline and then at 3, 6, and 12 months following the completion of the workshop. The unconditional scale score means for each group at each wave are reported in Table 4. To put the differences of the average scores within the workshop group into context, the difference of 0.21 score points between baseline and 6 months, for example, represents 0.3 standard deviation units (using the pooled standard deviation at baseline of .71). In comparison, the difference between a general multinational sample and a group of known environmental activists was 0.4 standard deviation units when the scale was psychometrically evaluated (Alisat & Riemer, 2015).

To formally test these changes and account for difference at baseline, the repeated measures for each participant were modeled as

Table 4. Mean Environmental Action Scores of Participants with at Least Two Data Points at Each Wave

	BASELINE	3 MONTHS (INTERVIEWS)	6 MONTHS	12 MONTHS
Comparison	1.82 ($N=163$)	NA	1.79 ($N=147$)	1.83 ($N=123$)
Workshop	2.18 ($N=100$)	2.89 ($N=63$)	2.39 ($N=91$)	2.19 ($N=75$)

Table 5. Hierarchical Longitudinal Model of Environmental Action Scores ($N = 260$)

PARAMETER	ESTIMATED COEFFICIENT	*SE*
Fixed Effects		
Intercept	1.75***	0.31
Time (growth rate)	–0.07*	0.03
TimeSquared (acceleration)	0.00	0.00
Age	–0.03*	0.01
Age*Time	0.003*	0.00
Developed	–0.20***	0.06
Prior env. engagement	0.10***	0.03
Self-efficacy	0.37***	0.05
Group	–0.06	0.06
Group*Time	**0.10*** **	**0.02**
Group*TimeSquared	**–0.009*** **	**0.001**
Fit Statistics		
-2ResLog Likelihood	1274.0	
AIC	1294.0	

Note. *SE* = standard error; Group (1 = YLEC workshop group; 0 = comparison); Time (0, 3, 6, and 12 months); Developed (1 = student from Canada, Germany, or the United States; 0 = student from Bangladesh, India, or Uganda).

*$p < .05$; ***$p < .001$.

individual growth curves by including both time and time squared as predictor variables in the model. The change over time among the workshop participants was compared to those in the comparison group by using a dummy variable (1 = workshop group) and evaluating the cross-level interaction of that variable with the respective time variables. To account for individual differences at baseline, age, prior environmental engagement, self-efficacy beliefs in regard to community engagement and action, and the country's development status (economically developed vs. developing) were included as control variables. Other possible control variables, such as gender, were not included in the final model because they were determined to be not statistically significant in the model development process.

As can be seen in Table 5, any differences between the two groups (workshop vs. comparison) on the environmental action scale at baseline are rendered statistically insignificant once the other variables are controlled for, indicating the success of using these controls. The small but significant negative coefficient for time and the nonsignificant coefficient for time squared suggest there is a small linear decrease in environmental action over time within the comparison group. The two significant interaction terms of group with time and time squared indicate a concave-shaped change over time for the workshop group with some initial increase in environmental action during the first several months followed by a decline, with engagement levels at 12 months that are very similar to baseline levels. The different patterns of change between the two groups suggest that the workshop series had an impact on the workshop participants' engagement in environmental action (as assessed by the scale) initially but that, on average, that impact was not sustained at 12 months. There were, however, individual cases that displayed sustained engagement in the type of actions measured by the scale.

The qualitative interview data, which were collected at the 3-month follow-up, support the finding of an initial spike in environmental action. Many interviewees describe a shift from just focusing on a few simple behaviors in their personal practice (e.g., recycling) to engaging in environmental action. Students report engagement in participatory actions such as educating themselves more about environmental issues (e.g., paying more attention to news about environmental issues) and talking to others about these types of issues. The confidence they gained through their participation also encouraged some participants to influence the behaviors of others, such as roommates, friends, family members, and even strangers, such as this participant from India who is raising awareness among her Facebook friends:

> Wherever there's an environmental issue that I read about … then I share those links or whatever on Facebook and, you know, that people will see my interest and people who don't even seem that interested and [I] try to get their attention, because I think telling people about this and spreading the word helps more than anything else. (IND019)

Other examples of actions participants were engaged in during the first 6 months[3] include joining an environmental organization or club; being involved in environmental research; implementing environmental practices at their school or workplace; participating in and organizing protests, boycotts, petitions, or community events; helping out in the community; and being involved in conservation efforts.

[3]The 6-month follow-up survey included a question asking participants to indicate specific actions they have taken.

Many participants discussed how, prior to participating in YLEC, they were already aware of environmental issues (to varying degrees) and did pay attention to some aspects of the environmental impacts of their personal practice but that, after the workshop series, they were engaged at a higher, more intensive level, as discussed in the previous section.

Interviewees also described how they shifted from focusing on a few environmental behaviors in their personal practice to incorporating environmental consideration more generally into their decision-making. For example,

> I have become more sensitive. So, I'm going to think twice before I do anything that may be potentially damaging; but you might think twice before turning on the A/C and I think about those CFE's or whatever that's going to be polluting the environment. (IND07)

Another form of transference was the application of what participants learned, mostly as part of the action project, to other contexts, such as Canadian students getting their roommates to use green bins for compostable waste, Indian students collecting e-waste at home, or Ugandan students going into other villages to teach people about energy-efficient cookstoves.

Impact on motivation and intentions. Independent of whether participants reported having actually engaged in any specific environmental actions at the time of the interview, most of them described that the workshop has increased their motivation to engage in environmental action and change their personal practice. In many cases, the participants described that the workshop series reinvigorated or intensified their motivation to do something for the environment.

Several interviewees mentioned specific intentions to act in the future, when the right opportunity comes up and they are facing fewer barriers. For example, a few students mentioned that they are likely to seek out environmentally focused jobs, and several others predicted that they will somehow have an influence on environmental practices in a possible future job. Many cited lack of time and opportunities as barriers for not taking more action; as this Canadian student reports, "I think I now know of more ways I can get involved, um, and I probably will eventually, right now I'm way too busy" (CAN42).

Discussion

The goal of this article was to investigate the impacts of the YLEC workshop series on participants—especially in regard to environmental action—using mixed-method longitudinal data from case studies in six different countries. Engaging young people in environmental action is different from fostering specific proenvironmental behaviors in people's personal practice (Alisat & Riemer, 2015; Ockwell et al., 2009), which has received much more empirical support (Riemer et al., 2013). Programs that promote environmental action tend to focus on root causes and community and political participation—including participatory activities related to raising critical consciousness, fostering systems thinking, and promoting action competence—and rely on smaller group processes such as peer mentorship (Alisat & Riemer, 2015; Blythe & Harré, 2012; de Vreede et al., 2014; Dittmer & Riemer, 2013). Our findings suggest that these types of programs, such as YLEC, can be successful if carefully designed based on a strong theory of engagement grounded in the relevant literature and provided with a certain level of flexibility to be adapted to the local culture and context.

The literature in adult learning suggests that a shift toward critical consciousness about certain issues, such as social justice, can be fostered through transformative learning experiences. Transformative learning experiences are those that promote perspective transformation, that is, the adoption of new frames of reference, or the revision of existing ones (Mezirow, 2000). This type of transformation entails an increase in one's critical awareness of taken-for-granted assumptions and their origins in sociocultural structures, an integration of this new awareness into one's habits of thought, and a resulting change in behavior to bring action into alignment with cognition. The workshop series provided several such transformative learning experiences, such as conversing with students from another country with different experiences of the impacts of global climate change and hearing the story of somebody with personal experience of environmental injustice. Our findings indicate that these types of experiences are also effective when used to engage youth because they result in powerful personal transformations across multiple dimensions. This effect was the case for both how the participants are connected to environmental issues and how they perceive themselves as environmental change agents. This finding provides support to those who argue that personal transformations are critical in promoting social transformation (Harré, 2011; Sterling, 1996).

Our findings also support the idea that an environmental justice framework can be a powerful way to simultaneously create motivation for action that is fuelled by compassion and empathy rather than self-interest, and to promote systems thinking that helps youth comprehend the complexity of global climate change and sustainability. In the context of promoting transformative social change, this type of motivation is important because it has been found that

people who are motivated to act because of their concern for harm, fairness, and social justice and those with a more progressive political orientation seem to be more likely to favor stronger responses and engage in collective environmental action compared to those who are mostly driven by their own self-interests (Dawson & Tyson, 2012; Kenis & Mathijs, 2012; Koger & Winter, 2010). As such, our findings lend support to those who have argued that ecopsychology should pay more attention to social and environmental justice (Manning & Amel, 2014).

Finally, our findings highlight the fact that personal transformations are not sufficient in creating long-term change. Additional factors, such as social support, connections with existing organizations, and opportunities that are within reach of the youth may be necessary to keep the fire ignited. This is confirmed in the Ugandan case study, where participants had a strong connection to the community partner and stayed connected beyond the workshop series through an online forum (Dittmer et al., 2016).

Limitations

Ideally, environmental challenges are addressed working in multinational, interdisciplinary, and trans-sectional teams promoting active citizenry for sustainability both locally and cross-nationally (Riemer & Schweizer-Ries, 2012). The YLEC project accomplished that and also facilitated an exchange between economically developed and developing countries with a focus on climate justice. This approach, however, comes with its own challenges, especially when trying to implement a rigorous research design. For example, it would have been ideal to only recruit students from one discipline across all six countries, in order to avoid confounding the country effect with a discipline effect. Given that our team members were from different disciplines and that the workshop series was offered through their home departments, it was not possible to recruit only one type of student. Therefore, we were very careful in drawing conclusions about differences between countries. Also, the challenges with recruitment of participants in a few of the countries resulted in less weight of the data from those countries in the overall sample. Also, a certain level of flexibility in regard to the study procedures was required to accommodate specific circumstances in the local context. For example, ideally we would have collected all survey data online to have a consistent mode of data collection. But the local team in Uganda, for example, was very clear that we would get a much higher response rate if we collected the data in person. Finally, it would have been ideal to collect outcome data from all participants at the 3-month follow-up. Because of limited resources and worry about participation fatigue, however, we decided to only collect data from those youth who had already participated in the interviews, which excluded the comparison group participants. There was no obvious historical event that would have spiked a general increase in environmental action in any of the six countries, and the overall lack of change of average scores on the Environmental Action Scale for the comparison group across the three existing data points suggests that this group provides a valid way to test the effectiveness of the workshop series, especially after initial differences between the two groups were controlled for.

Despite these limitations, we are pleased that almost all sites were able to implement the workshop series as intended (with some limitations) and that the different types of data provided a rich picture of the impact the series had on its participants.

Conclusion

We believe that we have gathered sufficient evidence that YLEC is an effective approach in engaging youth from different cultural backgrounds and at different levels of prior engagement in environmental action. Although not all youth were engaged in environmental actions as defined in the introduction, almost all described a personal transformation that affected their personal practice and will likely result in actions at a later time when the right opportunity comes along. That is, as a result of their experience with YLEC, a fire has been lit within the participants that can be ignited given the right circumstances. It is clear from our research, and not surprising, that engagement in environmental action is a long process that can be fuelled by a program like YLEC but will require other factors to result in more involved leadership actions and long-term engagement. Engagement is a complex process requiring a comprehensive approach that includes cognitive, emotional, experiential, and empowering elements (Riemer et al., 2013). Our findings indicate that the evidence-based and carefully composed synthesis of active ingredients that tap into these different elements is key to the success of the YLEC workshop series.

Future research

Although this research contributes to narrowing the gap in empirically validated approaches and strategies for engaging youth and young adults in environmental action, more work is needed. For example, we need to better understand what approaches effectively support those who are already highly motivated. What type of training and support is most effective in keeping them engaged long-term? What are follow-up strategies that will sustain engagement past the initial few months? For example, would a mentoring program where previous cohorts mentor the current participants be an

effective strategy to develop leadership actions and create continued engagement? Also, would it be feasible to offer this type of workshop series outside the university context and to different age groups such as younger teenagers, which is something several participants encouraged? Another important question is related to the feasibility of certain components. For example, the live international exchange requires a lot of coordination and in some cases specific technical resources, which might not be readily available. Perhaps it would be sufficient to limit the exchange to an online forum or individual email or Facebook exchange. Finally, our findings suggest that many participants started to engage others and raise awareness about environmental issues among friends, family, and other people in their social network. It would be interesting to estimate the magnitude of this ripple effect, especially in regard to its positive impact on the environment.

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