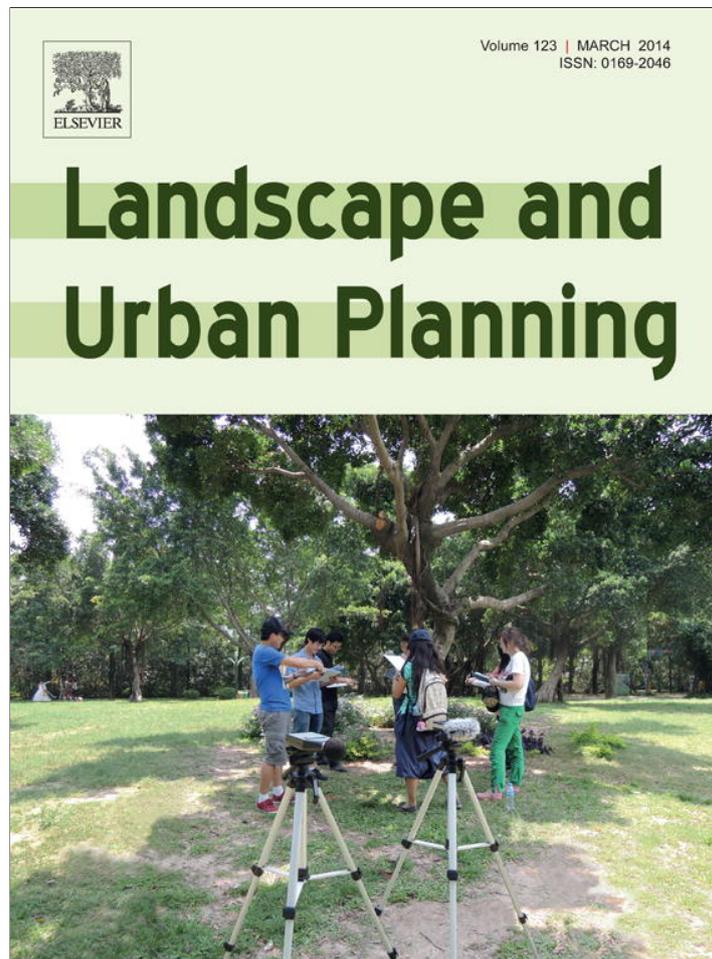


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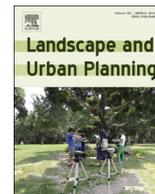
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## Research Note

## Benefits of urban landscape eco-volunteerism: Mixed methods segmentation analysis and implications for volunteer retention

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## HIGHLIGHTS

- Qualitative approaches to uncovering volunteer motivations are insightful.
- Social psychological motivations are expressed more than environmental motivations.
- Different demographic groups of volunteers prioritize different motivations.
- Practitioners can capitalize on motivations to enhance urban landscape conservation.

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## ABSTRACT

Urban landscape restoration and conservation initiatives are challenged by financial and other constraints. Consequently, these initiatives are increasingly reliant on volunteer stewards. Knowledge of why people volunteer to restore and conserve urban ecosystems can help practitioners enhance volunteering as a social-ecological process that is mutually beneficial to landscapes and people. We included two open-ended questions about why people volunteer and what they perceive as benefits of volunteering, in a survey of volunteers for urban landscape restoration and conservation in Seattle, WA. Thematic and statistical analyses of volunteer motivations showed that volunteers expressed social psychological motivations more frequently than environmental reasons for volunteering. We also found that volunteers are not a monolithic group. There were statistically significant differences in the frequency of expression of volunteer motivations among respondent demographic segments. For example, women expressed the quest for positive emotions, as a motivation to volunteer, more often than men did. We illustrate how understanding volunteers' motivations, expressed in their own words and from their own points of reference, can enhance voluntary social-ecological processes that mutually benefit people and urban landscapes.

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## 1. Introduction

Increasing urbanization and consequent alteration of urban settings have led to significant biodiversity loss and ecological degradation of urban landscapes (Tsuji, Ushimarua, Osawab, & Mitsuhashic, 2011; Vimal, Geniauxb, Pluvineta, Napoleoneb, & Leparta, 2012). There are increasing appeals for efforts to minimize the ecological effects of urbanization through restoration and conservation (Cox, 2010; Dearborn & Kark, 2009). But, efforts to restore and conserve urban landscapes are restricted by financial, time, labor, and other constraints (Cabin, Clewell, Ingram, McDonald, & Temperton, 2010; Geist & Galatowitsch, 1999). Restoration

and conservation, in urban settings, are increasingly reliant on volunteers—people who devote their time and effort, seemingly without pay, to restore and conserve urban landscapes (Sanderson & Huron, 2011).

However, volunteerism is declining in most of North America—volunteer-dependent initiatives face difficulties retaining the services of volunteers (Hall, Lasby, Gummulka, & Tyron, 2006; Putnam, 2000). Given these constraints, the restoration and conservation of urban landscapes stand to benefit from efforts that facilitate volunteer retention. But, to retain volunteers, we must first understand why people volunteer (Clary, Snyder, Ridge, Miene, & Haugen, 1994). We need to understand what initiates, directs, and sustains the behavior of volunteering to restore and conserve urban landscapes (Clary et al., 1998).

Several scholars have shown that both environment-related and several non-environmental factors, including emotions, motivate pro-environmental volunteering behaviors (e.g., Bruyere & Rappe,

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2007; DiEnno & Thompson, 2013; Kals, Schumacher, & Montada, 1999; Wahl, 2010). However, these studies either focus on one motivation such as emotions (e.g., DiEnno & Thompson, 2013; Kals et al., 1999) or are predominantly quantitative (e.g., Bramston, Pretty, & Zammit, 2011; Bruyere & Rappe, 2007; Grese, Kaplan, Ryan, & Buxton, 2000; Measham & Barnett, 2008). Despite significant contributions of these quantitative approaches, they present some limitations. First, use of closed-ended questions with pre-determined response options presupposes that the researcher has profound a priori knowledge of what is pertinent to the research subjects in terms of motivations and response options. This is seldom true in the assessment of intangible attributes of human psychology, such as motivations (Bliss & Martin, 1989). In some cases, closed-ended questions are less reliable and less valid than open-ended questions (Visser, Krosnick, & Lavrakas, 2000). For example, in many quantitative studies of environmental volunteer motivations, the environment is ranked and interpreted as the most important reason for volunteering (e.g., Grese et al., 2000). But, evidence is accumulating that importance rankings originating from closed-ended questions do not reflect actual salience of what motivates volunteerism (Asah & Blahna, 2012, 2013; Ryan, Kaplan, & Grese, 2001). In these studies, the environment was ranked most important but not a significant predictor of volunteer participation, commitment and involvement to pro-environmental volunteerism, respectively.

Quantitative approaches are also subject to priming effects wherein the information or response options provided to respondents affect their responses (Schuman & Presser, 1981). Thus, quantitative assessments of volunteer motivations may paint only a partial picture of the actual importance and influence of volunteer motivations, and incompletely inform volunteer recruitment and retention efforts. A more detailed and nuanced understanding of the salience of volunteer motivations may emerge from qualitative expressions of volunteer motivations. Open-ended questions provide this deeper and more nuanced understanding (Esses & Maio, 2002); they enable respondents to express their motivations in their own words and from their own frames of reference (Bengston, Asah, & Butler, 2011).

A second limitation is the consideration of volunteers as a monolithic group. The functional approach to attitudes and persuasion stipulates that motivators of the same behavior may be quite different for different people (Katz, 1960; Smith, Bruner, & White, 1956). For a diverse group of volunteers, motivations may have differential salience and consequent influence pro-environmental volunteering attitudes and behaviors. Volunteer recruitment and retention efforts could benefit from understanding what motivates which segments of the volunteering community. Such understanding could help practitioners design effective participation appeals and, through planning, manage volunteer events to facilitate mutually beneficial outcomes for landscapes and people. Consequently, understanding the motivations of volunteer subgroups can enhance volunteer retention and diversity. Additionally, scholars have suggested the need to broaden our understanding of volunteer motivations. For example, Measham and Barnett (2008) recommended further research on the different types of motivations held by different volunteers in different environmental volunteering contexts, to inform volunteer retention.

In this note, we report on a survey of 242 urban landscape volunteers in Seattle, WA. Volunteers were asked to explain in their own words, why they volunteered. Results were quite different from those of quantitative studies in the literature, and they help provide a more comprehensive and useful understanding of what motivates pro-environmental volunteerism. We show that volunteers are not a monolithic group with respect to the reasons why they volunteer. We present differences in motivations based on demographic variables: gender, age, income, level of education, ethnicity, and

employment status. We discuss how the results could be useful in enhancing efforts to recruit and retain a diversity of volunteers in volunteer-dependent urban landscape restoration and conservation initiatives.

## 2. Methods

### 2.1. Study area and data collection

Invasive species and ecosystem degradation are significant conservation concerns within the Seattle–Tacoma urban area and surrounding region (e.g., Reichard & White, 2001). These threats have been met with several restoration and conservation efforts. Most of these efforts are carried out through a mix of governmental, non-profit, and community-based volunteer events organized by various volunteer-dependent organizations. Volunteer events were selected for inclusion in this study by following a comprehensive listing of volunteer events in the Seattle–Tacoma area. These events were found through announcements and recruitment messages on websites, newspaper articles, the radio, word of mouth, and other sources. A stratified—on the basis of the variety of volunteer-dependent organizations and type of activity—random selection of such events was made for each week, and those events were visited for respondent recruitment. Many of these events were organized by city parks, some were citizen-based community gardens, including a fruit orchard, and others were non-profit-based volunteer events. The majority of the events involved invasive species removal and planting of native species. Other activities included, building raised garden beds, trail maintenance and restoration, erosion control, water quality testing and education, bird tagging, removal of social trails in parks, etc.

Study participants were recruited onsite during these volunteering events in the Seattle–Tacoma metro area in Washington State. We visited 34 volunteering events between January and April 2011 and collected 329 useable email addresses through which a survey questionnaire was sent to respondents. Four periodic reminders followed the initial e-mailing to non-respondents (Dillman, Smyth, & Christian, 2009). The survey questionnaire contained a prelude to environmental volunteering and two open-ended questions: (i) why do you volunteer? (ii) what do you think are the benefits, if any, of volunteering to you and in general? The questionnaire also assessed various demographic attributes (age, gender, etc.) of volunteers.

### 2.2. Data analysis

Responses to the open-ended questions were analyzed using NVivo Software, version 9, to identify and categorize motivations and benefits expressed by respondents. Data was analyzed in two stages. First, we carefully read the entire textual responses to the open-ended questions, and placed relevant texts in two broad themes of environmental, and non-environmental motivations. The environmental theme contained expressions of the motivation to do something to benefit the biophysical environment in the broadest sense of the term (place, outdoors, nature, etc.), while the non-environmental theme consisted of expressions of the benefits to volunteers. We labeled the non-environment-related theme, “social psychological” motivations because of the dominance of expressions of social psychological benefits to volunteers. Then we proceeded, using an iterative approach, to code the texts in each of the two broad themes into subthemes. Using that iterative approach, we drafted an outline of recurring subthemes within the environmental motivations theme, reconciled differences between outlines, coded the entire database of text, and cross-referenced each subtheme back to the original text (Glasser & Strauss, 2008).

A similar procedure was used to code the text in the broad theme of social psychological motivations into several subthemes.

The iterative coding approach was both deductive and inductive. Deductively, motivation subthemes from previous studies of environmental volunteer motivations served as a coding and analytic guide. Several of those subthemes, including helping the environment, emotional wellbeing (positive emotions), community, socializing, meaningful action, values, learning, career, health, get outside, personal growth, protection and user were obtained from several sources (e.g., Allison, Okun, & Dutridge, 2002; Bramston et al., 2011; Bruyere & Rappe, 2007; Clary et al., 1998; Grese et al., 2000; Miles, Sullivan, & Kuo, 1998). Texts that conveyed distinct motivations and benefits expressed by respondents and matched these subthemes were iteratively searched and placed in these categories.

Inductive analysis was used for the remainder of texts that did not fit quite well in any of the pre-existing subthemes used in the deductive analysis. Inductive coding and analysis followed the grounded theory approach (Glasser and Strauss, 2008)—in which important concepts emerge during data analysis, rather than from preexisting knowledge/studies, as is the case with deductive analysis. Thus, as an analytical approach, it minimized the influence of our presumptions about volunteer motivations. Through the grounded theory approach, the remaining text and codes were iteratively grouped into emergent subthemes that reflected participants expressed motivations and benefits to volunteer for urban landscape sustainability initiatives. The grounded theory approach is especially suited to reveal diverse motivations and unearth unexpected meanings from the reference points of respondents (Bengston et al., 2011).

The majority of respondents listed multiple motivations in response to open ended questions. Responses varied from a few words, phrases, to entire paragraphs with as many as 20 unique themes and/or subthemes of motivations. All responses listed were coded. Many expressions also contained multiple motivations and were coded accordingly. For example, the expression 'to help me feel that I am useful and that my efforts matter' was coded in both subthemes of Ego Defense and Enhancement, and Meaningful Action, while the expression 'I enjoy fixing nature' was coded in both sub themes of positive emotions and helping the environment. The frequency of expression of motivation themes and subthemes were computed to verify which motivations are most frequently expressed.

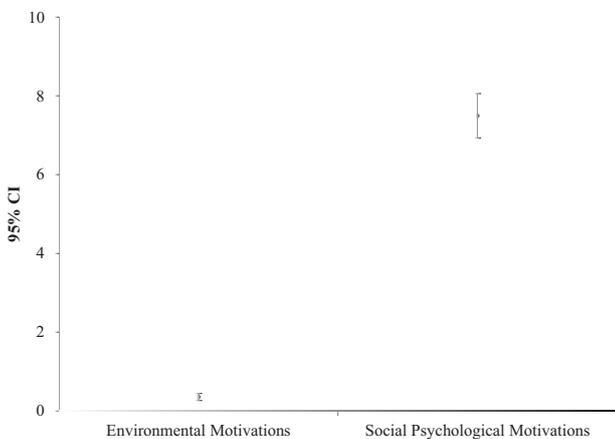
Respondents were grouped on the basis of six major demographic attributes: (1) race, two groups, white and non-white—low percentage (~20%) of nonwhite respondents made it empirically

**Table 1**

Sample quotes for each motivation subtheme for all volunteer respondents. Motivation subthemes are listed in descending order of frequency of expression.

Motivation subtheme	Sample quote(s)
Positive emotions	"It is fun"; "Because I enjoy doing it"; "It makes me feel good"
Community	"Being part of a community"; "Sense of community"; "Contribute to community"
Socializing	"Social connection"; "Meet like-minded people"; "Meet new people"
Meaningful action	"Makes me feel like I am making a difference"; "To help further causes I believe in"
Values	"I believe in service"; "I have a strong ethic for giving back"; "I feel it is our duty in this life to contribute"
Learning	"I learn new things"; "Learning new skills"; "Keeps my brain sharp"
Altruism	"To give back"; "To help others"; "For the greater good"
Dependence on volunteers	"Because without volunteer efforts in urban parks/forests across cities, there would be no way for the public to enjoy natural beauty in city settings"; "Otherwise the work wouldn't get done"
Career	"Gain professional experience"; "Networking"; "Resume builder"
Satisfaction	"It is satisfying"; "There is a sense of accomplishment"; "I find it...rewarding"
Health	"Exercise"; "It is physical"; "Keeps me active"; "Fresh air"
Help environment	"Help the environment and wildlife"; "The condition of our urban forests are poor, and they could use the help"
Sharing knowledge and using skills	"Teaching others"; "I love sharing my knowledge with others"; "Putting my skills to good use"
Ego defense and enhancement	"I will admit that it also appeals to my pride"; "It increases my self-esteem"; "It makes me feel better about myself"
Social identity	"To be part of something larger than self and family"; "I am part of a cause that is bigger than myself"; "It is my responsibility to give back to society"
Get outside	"To be outside"; "I love to work outdoors"
Protect the environment	"I love nature"; "Preserving, protecting, or creating ecosystem services that I value"
Personal growth	"To help myself built character"; "It also makes me a better person"
Preventative-protection	"Getting up and volunteering early on a Saturday morning doing some semi-hard labor intensive work is a good excuse to eat a big hamburger and drink beer in the afternoon"; "Gets me out of the house"
Recreation and leisure	"I love gardening"; "Because I love horticulture"; "I enjoy working in nature";
User	"Lessening the impact of humans on our fragile environment"; "Give something back to the facility we use frequently"
Legacy for future generations	"I want to leave a legacy for future generations"; "Concern for my daughter's future"
Time rather than money	"I don't have a lot of money - but I do have a bunch of time on my hands"; "I would rather give my time"
Convenience	"Location"; "Neighborhood Park"; "I happen to live right next to [it]"

meaningless to separate further the 'non-white' group; (2) gender; (3) age, four groups: generation Y (Millennials), born between 1995 and 1981, generation X, born between 1980 and 1965, baby boomers, born between 1964 and 1947, World War II, born before 1946 (Strauss & Howe, 1991); (4) level of education, four groups: high school, vocational school, college, and graduate school; (5) employment status, five groups: employed full time, part time, student, retired, and unemployed; and (6) income groups: low, medium, and high income following US Census Bureau's household income classifications—low income (<\$39,999); medium income, (\$40,000–\$79,000); high income, (\$80,000+).



**Fig. 1.** Mean scores of the total frequencies of expressions of environmental and social-psychological motivations.

**Table 2**

*P*-values for test of differences in the frequency of expressed motivation subthemes within each segmentation criteria group. *P*-values for significant differences ( $P < 0.05$ ) among groups for each demographic attribute are highlighted in bold.

Motivation subtheme	<i>P</i> -values for within segmentation criteria group					
	Gender	Race	Employment	Education	Income	Age
Positive emotions	<b>.027</b>	.235	.100	.588	.208	<b>.034</b>
Community	.843	.857	.436	.167	<b>.035</b>	.089
Socializing	<b>.043</b>	.922	.477	.281	.939	.293
Meaningful action	.211	.520	.197	<b>.033</b>	<b>.044</b>	<b>.001</b>
Values	.229	.174	.657	.794	.118	.498
Learning	.171	.296	.492	.812	.059	.758
Altruism	.056	.823	.866	.684	.373	.588
Dependence on volunteers	.148	.920	.786	.455	.777	.535
Career	.333	.145	<b>.000</b>	.250	<b>.001</b>	<b>.000</b>
Health	.065	.509	.371	.725	.596	.166
Help the environment	.366	<b>.030</b>	.275	.205	.786	.563
Sharing knowledge and skills	<b>.002</b>	<b>.003</b>	<b>.025</b>	.067	.089	<b>.045</b>
Social identity	.572	.951	.139	.592	.082	.102
Get outside	.961	<b>.009</b>	.743	.422	.098	.477
Protect the environment	.583	.740	.724	.873	.076	.362
Personal growth	.407	.138	.803	.935	.123	.627
Prevention and protection	.500	.679	.838	.115	.658	.965
Recreation and leisure	.965	.076	<b>.041</b>	.478	.845	.126
User	.397	.793	.335	.607	.919	.325
Legacy for future generation	.406	.913	.558	.279	.428	.888
Time rather than money	.878	.594	.784	.054	.138	.769
Convenience	.791	.686	.776	<b>.013</b>	.971	.666
Overall environmental motivations	.306	.377	.929	.594	.183	.597
Overall social-psychological motivations	<b>.016</b>	.545	.699	.099	.813	.121

The frequencies of expressed motivation themes were computed and recorded in SPSS (version 19) for statistical analysis. The sums of all environmental and all non-environmental motivations were computed and one-sample *T*-tests were conducted to test whether respondents significantly expressed both environmental and non-environmental motivations at least once (i.e., test value, 1). Independent sample *T*-test was used to test for differences in frequencies of expression of motivations between gender groups; ANOVA was used to test for overall differences among segments within the age, income, education level, and employment status groups (Field, 2005). Games–Howell post hoc test (unequal variance and sample sizes) was used to test for differences between pairs of segments within each group.

### 3. Results

We received 242 responses for a response rate of slightly over 75%. Volunteer respondents expressed a wide range of different factors, values, beliefs and sentiments as reasons why they volunteer for environmental causes in urban settings. Two subthemes emerged from the environmental motivations theme: to help the environment which often referred to the motivation to restore the biophysical environment, and to protect the environment which often referred to the motivation to take pro-active measures to prevent degradation. All the other subthemes emphasized the social-psychological benefits of volunteering for urban landscape restoration and conservation. In general, the major theme of social-psychological motivations was expressed almost 20 times as often as the major theme of environmental motivations (Fig. 1).

Respondents' mean frequency of expression of environmental motivations (0.36) was significantly less than the test value ( $t = -14.13$ ;  $P = 0.00$ ;  $df = 241$ ), while the mean frequency of expression of social-psychological motivations (7.5) was significantly higher than the test value ( $t = 22.57$ ;  $P = 0.00$ ;  $df = 241$ ).

Overall, 24 subthemes emerged from the two main themes: two subthemes for environmental motivations and 22 subthemes for social-psychological motivations (Table 1). Table 1 shows the list of motivation subthemes and sample quotes for each subtheme. Positive emotions were the most frequently expressed motivation,

while volunteering because it was convenient was the least frequently mentioned motivation subtheme. The environment is not in the top ten most frequently expressed motivations (Table 1).

Results of significant differences in motivation subthemes among segments based on demographic attributes are shown in Table 2. For example, females expressed the desire to acquire positive emotions, socialize, share knowledge and skills, and overall social-psychological benefits as motivations to volunteer significantly more frequently than men (Table 2). Nonwhite volunteers expressed the motivation to help the environment significantly more frequently than white volunteers did, while white volunteers expressed the desire to share knowledge and skills, and to get outside significantly more often than nonwhite volunteers did (Table 2). Generation Y age group volunteers expressed the motivation to engage in meaningful action significantly less often than baby boomers ( $P = 0.023$ ) and WWII ( $P = 0.007$ ; Table 2).

### 4. Discussion

Our findings shed some light into the salience of factors that motivate volunteerism. Non-environment related motivations, particularly the desires for positive emotions, community, and to socialize are some of the most important reasons why people volunteer to restore and conserve urban landscapes. When survey respondents are enabled to express their motivations in their own words and from their own frames of references, and not primed by quantitatively scaled questions, the results are markedly different (Bengston et al., 2011). However, recent quantitative studies (Asah & Blahna, 2012, 2013; Ryan et al., 2001) also found social-psychological motives dominant and environmental reasons only marginally predictive. But these results were only clear after further statistical analyses of the effects of different motivators on actual volunteerism. These findings suggest that qualitative approaches might be more reliable (Visser et al., 2000) for assessing volunteer motivations. Nevertheless, the low salience of environmental motivations could be partially explained by the sampling period of this study, conducted in the winter when volunteers are expected to make additional sacrifices to accommodate the wet-cold conditions in the study area. It is somewhat likely that as the cost of

the behavior increases, mostly those with more personally relevant motivations—non-environmental reasons—will volunteer.

Another important finding of this study is the emergent evidence that volunteers are not a monolithic group. Different factors are more or less motivating to volunteers depending on their age, levels of income and education, gender, race, and employment status. For example, women are more motivated by non-environmental factors than is the case for men, and generation Y age group volunteers expressed the motivation to engage in meaningful action significantly less often than volunteers in the baby boomer and WWII age groups.

These findings could inform efforts to recruit and retain more numbers and diversity of volunteers. We know that people judge appeals as more persuasive, and will act in favor, if those appeals make it obvious how they could satisfy personally relevant motivations (Clary et al., 1994). We also know that understanding how people perceive the concept of restoration, for example, is a good starting point for involving people in restoration efforts (Barro & Bopp, 1999). If community, socializing, and positive emotions are the prioritized reasons for volunteering, appeals for participation should convey how volunteerism will help meet those social-psychological needs. But many recruitment messages tend to focus exclusively on the environment.

Volunteering events could also be planned and managed in ways that facilitate obtaining of social psychological benefits. Socially interactive activities could be included in the otherwise physical labor-oriented planning and management of these events. Additionally, practitioners could recurrently articulate the social-psychological benefits during volunteering events—utterances to volunteers such as “give yourself a big pat on the back, and feel good for volunteering today”, reinforces thought processes for evoking the motivations of positive emotions. The motivational content of these expressions could be modified based on the identified segment to which the volunteer may belong. Such expressions will help reinforce volunteers' associations between volunteering and positive emotions, for example. This, in turn, enables volunteers to more easily make the connection between the activity and positive emotions—the motivation becomes easily retrievable for deployment to influence volunteerism in the future.

## 5. Conclusion

Urban landscape restoration and conservation volunteerism is a social-ecological process that mutually benefits people and urban landscapes. Social-psychological benefits appear to be more salient than pro-environmental motivations to volunteers. Volunteers are not a monolithic group. The qualitative non-directive approach to understanding motivations facilitates finer distinctions in motivations that help illuminate differences in the salience of these motivations among different volunteer segments. Volunteer-dependent landscape restoration and conservation entities could retain more volunteers—enhance repeat volunteerism by making the social-psychological benefits of volunteerism, that are specific to particular segments of the volunteering community, more cognitively salient to volunteers. These can be achieved by including those benefits more explicitly in participation appeals, event promotion and communication, and throughout planning and managing volunteer events so that pertinent benefits are obtainable to particular volunteer groups.

This study is not without limitations. Sampling was conducted during winter season and could have been biased toward more involved volunteers. We also did not assess other pertinent factors such as duration of involvement that may be more salient differentiators of volunteer motivations. We also could not make pertinent inferences about how these motivations interact with

perceived barriers such as lack of information about volunteering events, availability of time, and proximity to those events. The method of observation was also somewhat problematic. Although the question was open-ended, they were observed via surveys with no opportunities for interactive discussions that could provoke further insights into volunteer motivations. Future studies could insightfully contribute to understanding volunteer motivations and consequent improvements in recruitment and retention efforts by exploring in depth, through qualitative interviews, these additional important factors. Observations could also be conducted during fair weather conditions/seasons to capture a more diverse group of volunteers.

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## References

- Allison, L. D., Okun, M. A., & Dutridge, K. S. (2002). Assessing volunteer motives: A comparison of an open-ended probe and likert rating scales. *Journal of Community & Applied Social Psychology*, 12, 243–255.
- Asah, S. T., & Blahna, D. J. (2013). Practical implications of understanding the influence of motivations on commitment to voluntary urban conservation stewardship. *Conservation Biology*, 27(4), 866–875.
- Asah, S. T., & Blahna, D. J. (2012). Motivational functionalism and urban conservation stewardship: Implications for volunteer involvement. *Conservation Letters*, 5, 470–477.
- Barro, S. C., & Bopp, N. A. (1999). What people think about ecological restoration and related topics: A first look. In *Proceedings of the fifteen North American Prairie conference*, vol. 15 (pp. 1–6).
- Bengston, D. N., Asah, S. T., & Butler, B. J. (2011). The diverse values and motivations of family forest owners in the United States: An analysis of an open-ended question in the National Woodland Owner Survey. *Small-Scale Forestry*, 10, 339–355.
- Bliss, J. C., & Martin, A. J. (1989). Identifying NIPF management motivations with qualitative methods. *Forest Science*, 35, 601–622.
- Bramston, P., Pretty, G., & Zammit, C. (2011). Assessing environmental stewardship motivations. *Environment & Behavior*, 43, 776–788.
- Bruyere, B., & Rappe, R. (2007). Identifying the motivations of environmental volunteers. *Journal of Environmental Planning & Management*, 50, 503–516.
- Cabin, R. J., Clewell, A., Ingram, M., McDonald, T., & Temperton, V. (2010). Bridging restoration science and practice: Results and analysis of a survey from the 2009 Society for Ecological Restoration international meeting. *Restoration Ecology*, 18, 783–788.
- Clary, E. G., Snyder, M., Ridge, R. D., Miene, P. K., & Haugen, J. A. (1994). Matching messages to motives in persuasion: A functional approach to promoting volunteerism. *Journal of Applied Social Psychology*, 24, 1129–1149.
- Clary, E. G., Snyder, M., Ridge, R. D., Copeland, J., Stukas, A. A., Haugen, J., et al. (1998). Understanding and assessing the motivations of volunteers: A functional approach. *Journal of Personality & Social Psychology*, 74, 1516–1530.
- Cox, L. (2010). Conservation where half the world lives. *Conservation Biology*, 24, 637–638.
- Dearborn, C., & Kark, S. (2009). Motivations for conserving urban biodiversity. *Conservation Biology*, 24, 432–440.
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). *Internet, mail and mixed-mode surveys: The tailored design method* (3rd ed.). Hoboken, NJ: John Wiley.
- DiEnno, C. M., & Thompson, J. L. (2013). For the love of the land: How emotions motivate volunteerism in ecological restoration. *Emotion, Space and Society*, 6, 63–72.
- Esses, V. M., & Maio, G. R. (2002). Expanding the assessment of attitude components and structure: The benefits of open-ended measures. *European Review of Social Psychology*, 12, 71–101.
- Field, A. (2005). *Discovering statistics using SPSS*. London, UK: Sage Publications.
- Geist, C., & Galatowitsch, S. M. (1999). Reciprocal model for meeting ecological and human needs in restoration projects. *Conservation Biology*, 13, 970–979.
- Glaser, B. G., & Strauss, A. L. (2008). *The discovery of grounded theory: Strategies for qualitative research*. New Brunswick, USA: Transaction Publishers.
- Grese, R. E., Kaplan, R., Ryan, R. L., & Buxton, J. (2000). Psychological benefits of volunteering in stewardship programs. In P. P. Gobster, & R. B. Hull (Eds.), *Restoring nature: Perspectives from the social sciences and humanities* (pp. 265–280). Washington, DC: Island Press.
- Hall, M., Lasby, D., Gummulka, G., & Tyron, C. (2006). *Caring Canadians, involved Canadians: Highlights from the 2004 Canada survey of giving, volunteering and participating*. Ottawa, ON: Statistics Canada.

- Kals, E., Schumacher, D., & Montada, L. (1999). Emotional affinity toward nature as a motivational basis to protect nature. *Environment & Behavior*, 31(2), 178–202.
- Katz, D. (1960). A functional approach to the study of attitudes. *Public Opinion Quarterly*, 24, 163–204.
- Measham, T. G., & Barnett, G. B. (2008). Environmental volunteering: Motivations, modes and outcomes. *Australian Geographer*, 39, 537–552.
- Miles, I., Sullivan, W. C., & Kuo, F. (1998). Ecological restoration volunteers: Benefits of participation. *Urban Ecosystems*, 2, 27–41.
- Putnam, R. D. (2000). *Bowling alone: The collapse and renewal of American community*. New York: Simon and Schuster.
- Reichard, S. H., & White, P. (2001). Horticulture as a pathway to invasive plant introduction in the United States. *BioScience*, 51(2), 103–113.
- Ryan, R., Kaplan, R., & Grese, R. (2001). Predicting volunteer commitment in environmental stewardship programmes. *Journal of Environmental Planning and Management*, 44, 629–648.
- Sanderson, E. W., & Huron, A. (2011). Conservation in the city. *Conservation Biology*, 25, 421–423.
- Schuman, H., & Presser, S. (1981). *Questions and answers in attitude surveys: Experiments on question form, wording, and context*. New York: Academic Press.
- Smith, M., Bruner, J., & White, R. (1956). *Opinions and personality*. New York: Wiley.
- Strauss, W., & Howe, N. (1991). *Generations: The history of America's future, 1584–2069*. New York: Morrow.
- Tsuji, M., Ushimaru, A., Osawab, T., & Mitsuhashi, H. (2011). Paddy-associated frog declines via urbanization: A test of the dispersal-dependent-decline hypothesis. *Landscape & Urban Planning*, 103, 318–325.
- Vimal, R., Geniaux, G., Pluineta, P., Napoleone, C., & Leparta, J. (2012). Detecting threatened biodiversity by urbanization at regional and local scales using an urban sprawl simulation approach: Application on the French Mediterranean region. *Landscape & Urban Planning*, 104, 343–355.
- Visser, P. S., Krosnick, J. A., & Lavrakas, P. J. (2000). Survey research. In H. R. Reis, & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 223–252). Cambridge, UK: Cambridge University Press.
- Wahl, V. (2010). *Why people help: Motivations and barriers for stewardship volunteering* (Ph.D. dissertation). University of British Columbia.