Volunteer well-being in biodiversity citizen science

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Introduction

Biodiversity citizen science (public participation in biodiversity monitoring) is increasing as people seek to rekindle their lost connection with nature and regain associated well-being benefits.

The extent to which participation in citizen science affects feelings of well-being in volunteers is likely to be associated with factors such as volunteer motivation, satisfaction and frequency as well as organisational engagement with volunteers and conservation outcomes of volunteering (fig. 1).

With increasing numbers of volunteers and biodiversity monitoring projects, understanding how these concepts interrelate is becoming increasingly important for citizen science project managers.

Here, we aim to elucidate the relationship between volunteer well-being and a motivation-engagement measure, satisfaction with volunteer experience and frequency of volunteering.

Methods

- Online and paper-based questionnaire distributed to biodiversity monitoring volunteers of National Trust, UK

- The Well-being Theory and PERMA* model (Seligman, 2011) were used as basis for measuring well-being with 17 items using a 7-point Likert scale

- Voluntary Functions Inventory (VFI) (Clary et al., 1998) was used to establish volunteer motivations by asking about the three main motivations for volunteering

- Engagement types were developed to match VFI motivation categories. Types were scored by the volunteers and then compared and scored against their top three motivations

- Multiple regression analysis was performed in R to evaluate how well the motivation-engagement measure, satisfaction and volunteer frequency predicted volunteer well-being

* The five elements of PERMA: P: Positive emotions, E: Engagement, R: Relationships, M: Meaning, A: Achievement

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The Volunteering Cycle

Volunteer motivation
Values. Understanding. Enhancement. Career. Social. Protective

Organisational engagement
Meaningful tasks. Workshops. Learning opportunities. Social network

Conservation outcomes
Data. Validated records. Informing management and policy. Enhancing habitats

Human well-being
Positive emotions. Engagement. Relationships. Meaning. Achievement

Figure 1. Our proposed 'Volunteering Cycle' showing how motivated volunteers and matching organisational engagement lead to increases in volunteer well-being and conservation outcomes, feeding back into the cycle.

Results

- Multiple regression showed that all three explanatory terms (satisfaction, frequency and the motivation-engagement measure) were important in predicting the overall well-being score (the model could not be reduced using AIC)

- The model was significant, explaining 35% of the variability of the well-being scores (n=25, $F_{5,18} = 3.45$, p = 0.0231, adjusted $R^2 = 0.0348$)

- There was a positive relationship between well-being and satisfaction (fig. 2)

- Well-being showed little relationship with frequency, except for the highest frequency of volunteering, where well-being decreased (fig. 3)

- There was a positive relationship between well-being and the motivation-engagement measure, although there were some outliers to this relationship (fig. 4)

- The top five scored well-being items among the volunteers belonged to four of the five elements of the PERMA model, i.e. Positive emotions, Relationships, Meaning and Achievement, leaving out Engagement
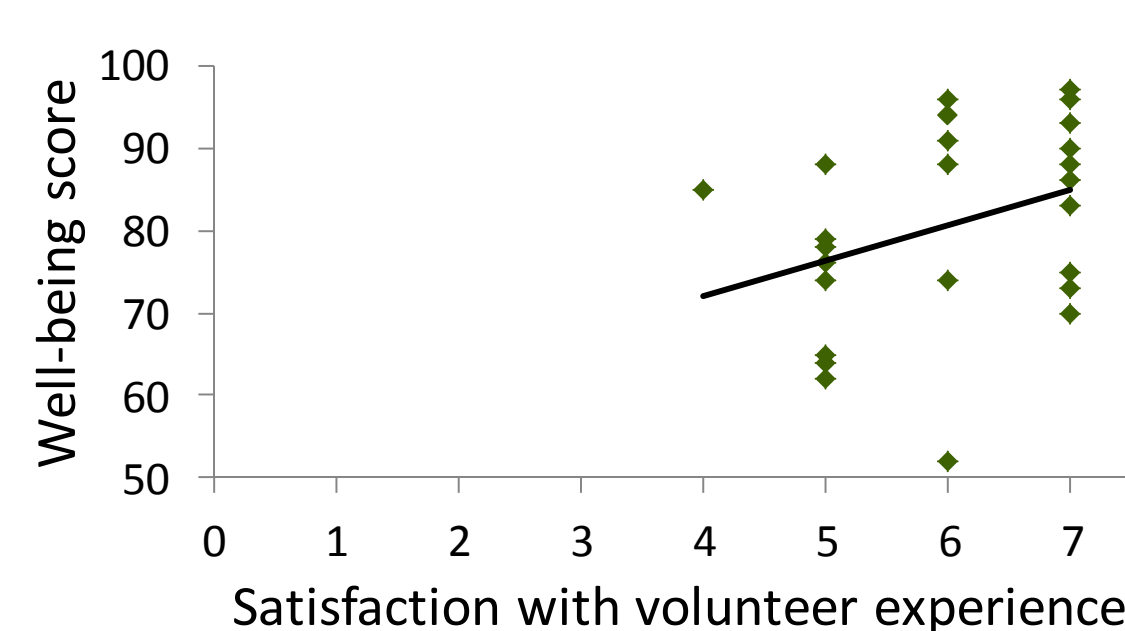

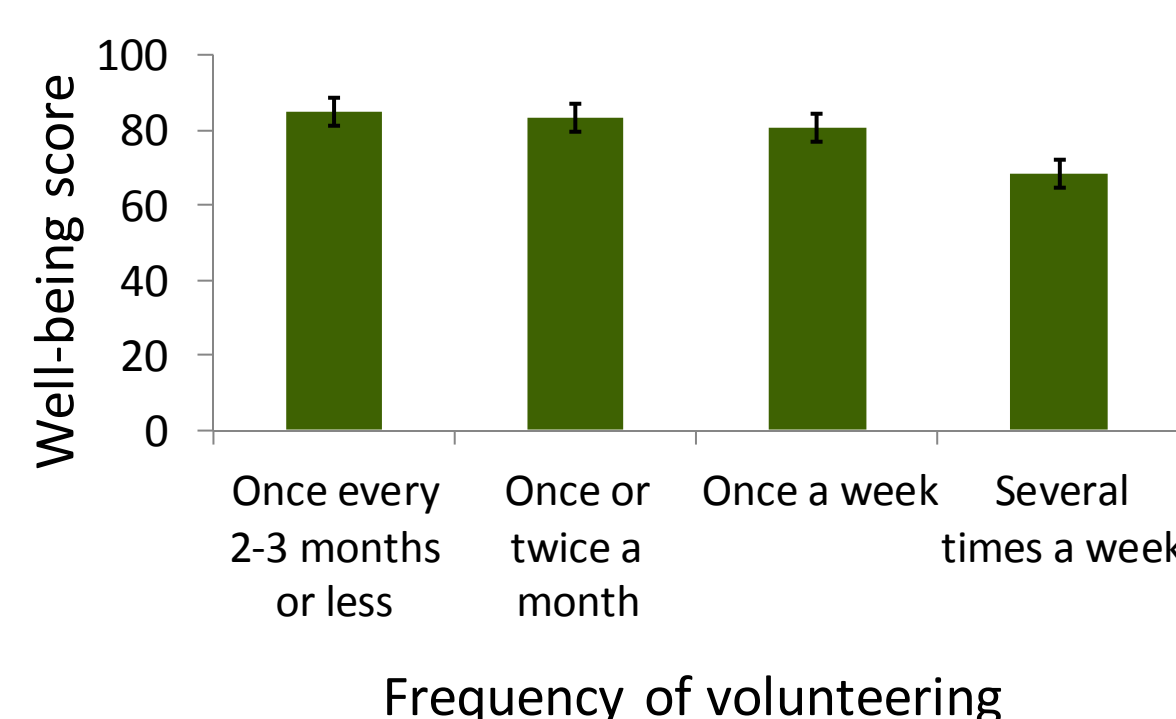Figure 2. Well-being score as function of the volunteer satisfaction level

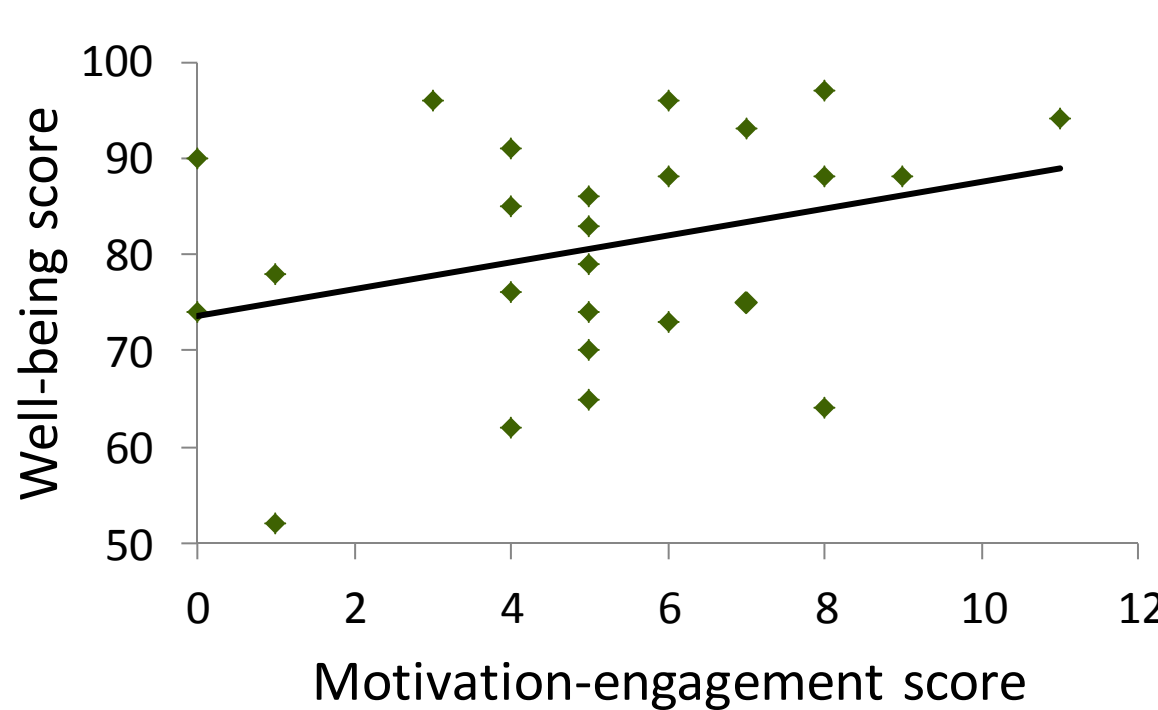Figure 3. Well-being score as function of volunteer frequency

Figure 4. Well-being score as function of the motivation-engagement score.

Conclusions

Volunteer well-being is partly explained here by a motivation-engagement measure, satisfaction with the experience and frequency of volunteering, thus highlighting the need for citizen science project managers to understand these factors.

Organisations must shape engagement activities to match the motivations of volunteers for increased overall satisfaction, providing the best possible basis for high levels of well-being among volunteers and their continued involvement with the projects.

The breadth of highly scored PERMA elements suggests that volunteer activities are linked to most, if not all, elements of well-being. A possible cause for 'Engagement' scoring low is a high rate of learning by volunteers on this project, thus a state of 'flow' is rarely reached.

Our results also suggest there may be an upper limit of well-being benefits related to the frequency with which volunteers participate in monitoring activities, possibly a manifestation of hedonic adaptation.

We are currently undertaking further study into the elements of the 'volunteer cycle' within conservation programmes to gain further understanding of how best to ensure that both the environment and volunteers flourish.

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