Aiming at a data driven definition of volunteer types: The key to improved volunteer management practices

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Abstract

Due to the huge heterogeneity of volunteering, generalizability of context specific findings from the literature regarding volunteer management practices is often limited. Furthermore, it seems that practitioner recommendations are consequently often too narrow or at times contrasting. To deal with this gap, we aim at a data driven approach to cluster volunteers into more homogeneous types, in order to enable (a) comparability of various volunteer contexts, and (b) differentiation of volunteer management strategies. Therefore, we apply an exploratory factor analysis, a cluster analysis and a canonical correlation analysis on a representative nationwide survey in Germany regarding volunteering behavior. Findings are however not robust and not suitable for further substantial interpretation, as the multivariate characteristics of the constructs probed for in the German Survey on Volunteering (GSV) are of limited quality (at least for our statistical analysis). Hence, we clarify the value of more elaborate questions in future large-scale data collection, and we discuss the remaining trade-off in the literature regarding generalizable but limited findings, versus more robust but context specific findings.

Key words: Volunteer types, management differentiation, German Survey on Volunteering (GSV), cluster analysis, canonical correlation analysis.

Introduction

Many seminal contributions have been made in economic, psychology, and managerial academic literature that support the improvement of volunteer management practices. Despite the great value of this academic literature, an important gap still remains regarding generalizability across the heterogeneous range of volunteer types, and for providing concrete recommendations to practitioners (Cnaan, Handy, & Wadsworth, 1996). The literature agrees on the existence of many distinct volunteer types and therefore various research findings might be limited to a particular volunteer type studied and/or tested in a specific context (Wilson & Musick, 1997). Research also suggests that volunteers are diverse and cannot be managed in a standardized way (Willems & Walk, 2013). As a result, from a scientific point of view, academics are often left puzzled about the lack of generalizability of particular findings to other types of volunteers; and from a practitioner point of view, recommendations provided for one type of volunteers or for a particular context might be not relevant for other volunteer contexts (Wilson, 2000).

Practical recommendations often implicitly assume that what might work for one volunteer type, also might work for other volunteers (regardless of the context, type of organization, type of volunteer tasks). However, recent research suggests that it needs a differentiated management approach in addition to a more standardized approach (Willems & Walk, 2013) in order to meet the various personal needs within and across organizations (Grube & Piliavin, 2000). Getting insights into particular types (or clusters) of volunteers can thus help practitioners in making decisions and developing strategies that target each volunteer type most appropriately (e.g. recruitment, expectation management, task allocation, etc.).

Once different types of volunteers are identified, the next step could focus on what particular volunteer management strategies are relevant for which volunteer type. Recommendations from earlier contributions on how to improve commitment of volunteers, reduce volunteer turnover, enhance volunteer efforts are often miscellaneous or even contradiction (Harrison, 1995; T. Vantilborgh, Bidee, J., Pepermans, R., Willems, J., Huybrechts, G., & Jegers, M., 2011; Willems & Walk, 2013). Therefore, a further evaluation and classification of practical recommendations based on the context for which they were derived, seems necessary in order to better address concrete and context dependent volunteer management challenges.

Given this gap our aim is twofold. First, we aim to complement the existing body of literature with a data-driven classification of volunteer types. In particular, we aim to describe several homogeneous clusters of volunteer types, within the broad and heterogeneous range of volunteering. Such classification, will allow academics and practitioners to frame findings and recommendations within and across boundaries of volunteer types. Second, we aim to develop practical insights on the various managerial strategies that might be relevant for particular volunteer types. This will enable the formulation of focused recommendations, taking into account the context and the specificities of various types of volunteers. In sum, our concrete research questions are: (1) Can we classify the broad heterogeneous range of potential volunteers in relevant and more homogeneous sub-types, and if so, what are their observable differentiating characteristics?; and (2)

what differentiation is relevant for each volunteer type regarding improved volunteer management strategies (such as allocation of tasks, need for skills, or rewarding incentives)?

We use a data-driven approach, as this allows us to maximize similarity of different volunteer criteria within types of volunteers, and to maximize clearly observable distinct and mutually exclusive types. Furthermore, we might be able to get insight in criteria that can distinguish types of volunteers, which might help practitioners to improve the differentiation strategies regarding attracting the best-fitting volunteers, incentivizing volunteers, coaching volunteers, etc. In other words, we aim to test for observable, and sufficiently broad criteria that can differentiate groups of volunteers. Both from an academic and practitioner point of view this is desirable, as it allows for defining clear-cut homogeneous types, in which generalizability can be high, and for which comparability with other types is more straightforward.

We perform a cluster analysis and a canonical correlation analysis based on several constructs from the German Survey on Volunteering (GSV); a large-scale representative volunteer sample (Müller, Schmiade, Vogel, Ziegelmann, & Simonson, 2013). Using a heterogeneous and nationwide set of volunteers should allow us to identify relevant criteria that make classification of more homogeneous subgroups of volunteers possible. In particular, we hope to identify a parsimonious set of volunteer clusters; not too many clusters, as it should be still be manageable (keep overview), and not too few, as it should still allow for sufficient detail, to have the possibility for a valuable differentiation regarding focused management strategies.

Dimensions to define Volunteer Types

In their seminal classification of volunteer types, Cnaan, Handy and Wadsworth (1996) evaluate existing definitions in the literature and identify four dimensions that are recurrent across different voluteer definitions. These dimensions regard the extent that volunteering (1) is done out of free choice, (2) is usually not remunerated, (3) is done in a formal context, and (4) is intendend for beneficiaries outside the personal environment of the volunteer. For each dimension, multiple gradient categories are defined that enable a strict versus a broad delineation for defining volunteers.

In addition to the dimensions and classifications proposed by Cnaan, Handy and Wadsworth (1996) several other dimensions and criteria can be derived from literature to group and describe more homogeneous types of volunteers. Acknowledging the immense range of relevant criteria, we identify three main dimensions to empirically derive clusters, and use a multitude of other variables to describe differences between the proposed cluster solution. These three dimensions are (1) volunteer general values (2) volunteer motives, and (3) volunteer skill requirements, with in each dimensions several concrete criteria. We selected these three literature-based dimensions for two reaons. First, from a contentwise perspective the combination of these three dimensions gives information on relvant criteria for every (potential) voluteer with respect to the overal society (life values), his/her personal intentions towards volunteering in particular (volunteer

motives), and the concrete context in wich he/she is volunteering (volunteer skill requirements). Second, with these three dimensions and their respective sub-criteria encompassed, we can build on a managebale set of criteria, nevertheless with sufficient detail, which is necessary for a sound cluster analysis.

In the subsequent sections we discuss the content and theoretical relevlance of each of the three dimensions.

Volunteer Life Values

Volunteering is an important element of prosocial behaviour, which in turn is related to a multidude of related variables that deal with a person's embededness in society (Wilson, 2000; Brown, 2000; Bussell and Forbes, 2002). Personal characteristics such as religion, social economic status and generational cohort explain why groups and/or layers of people in society engage in various forms of volteering (Deyaert, Willems, & Mortelmans, 2013; Eisner, Grimm Jr, Maynard, & Washburn, 2009; Hooghe & Stolle, 2003; Hustinx, 2007). However, despite the fact that these classifying characterisitcs have been shown to relate to volunteering or prosocial behavior in general, little is known about whether each of them relates more specificlally to particular volunteer types (Finkelstein, Penner, & Brannick, 2005). As a result, information on a person's life values might show high relevance for finding and describing more homogenous types of volunteers.

Volunteer Motives

In addition to the overal life values of a person, individual motives conceptiualizing the particular context of volunteer behavior can substaintly complement the relevant set of information to derive more homogeneous subgroups. Most influential in this area is the functional approach to volunteering introduced by Clary and colleagues (Clary & Snyder, 1999; Clary et al., 1998; Clary, Snyder, & Stukas, 1996). In this approach the assumtion is embedded that various distinct motives are at the base of a persons willingness to volunteer.

Clary and colleagues (1996, 1998, 1999) distinguish six functional volunteer motives: 'values', 'understanding', 'career', 'enhancement', 'protective' and 'social'. The functional motive 'values' regards the personal altruistic values of a person to volunteer. 'Understanding' is the motivation that people have to learn through volunteering. The 'career' motive, expresses the desire to enhance professional career opportunities. With the 'enhancement' motive the search for self-esteem and personal growth through volunteering is expressed, while 'protective' motive considers volunteering as a means to compensate for own negative feelings, such as guilt or sorrow. For the 'social' motive, Clary et al. (1998, p. 1518) describe its functionality as follows: "Volunteering may offer opportunities to be with one's friends or to engage in an activity viewed favorably by important others". Within this definition we distinguish an internal aspect, directed towards other volunteers regarded as friends, and an external aspect, directed towards important others. This distinction is also empirically found in Willems et al. (2012) and in Willems and Walk (2013).

Empirical findings reported in the literature with respect to the relationship between functional motives and indicators of volunteer behavior substantially differ and sometimes even conflict with each other (Willems and Walk, 2013). A potential explanation might be that these findings are dependent on the specific type of volunteers that were the focus of the respective studies. As a result, using functional motives could be a relevant criterion that might help in classifying homogeneous groups of volunteers.

Volunteer Tasks and Skill Requirements

While the previous two dimensions should enable us to classyfy volunteers based on their background and intentions to engage in volunteer behavior, this dimensions should enable us to differentiate for different types of volunteer work in the concrete context of an organization.

The way volunteers allocate their time to an organization is episodic and complex (Harrison, 1995). This means that volunteers continuously trade off four aspects based on their past experiences and future expectations: (1) potential return of future volunteer work, (2) the extent to which people from one's environment consider volunteer work important, (3) the opportunities to volunteer, and (4) the clarity of volunteer benefits to the individual. In the end, this trade-off influences the decision to stay at or to leave an organization when benefits do no longer exceed costs. As a result, the concrete content and tasks that someone is supposed to do as a volunteer and the required skills of the volunteer job are context specific characteristics that can determine whether or not and to what extent a person is engaged as a volunteer (Grube & Piliavin, 2000; Houle, Sagarin, & Kaplan, 2005; Millette & Gagné, 2008; Wymer, 2011). For example, volunteers who have challenging tasks that are in line with their own expectations are less likely to stop volunteering for an organization (Jamison, 2003; T. Vantilborgh et al., 2012). Furthermore when tasks are designed and/or assigned in accordance to personal needs and expectations, and when skill requirements are within the abilities of volunteers, they are likely to be more committed and have lower intentions to leave (Farmer & Fedor, 2001; Finkelstein et al., 2005; Ryan, Kaplan, & Grese, 2001; Van Vianen, Nijstad, & Voskuijl, 2008; A. M. Ward & McKillop, 2011). As a result, by incorporating tasks and skill requirements as criteria, we also take context specific classifiers into account. This is in particular relevant to find differences across types of volunteers that relate to the concrete content of the broad range of volunteer opportunities that exist.

Empirical Analyses

This research draws on data from the German Survey on Volunteering (GSV). Volunteering in Germany is prevalent in all areas of society ranging from sports, social activities, education to religion, health and the environment (Priller, 2010). Whereas our findings might not be completely generalizable to other countries, we assume that the patterns will look similarly in other western countries. To answer our research questions, we utilized different methods. This section describes the data, sample characteristics as well as

variables used. Furthermore, we describe the statistical methodology applied immediately followed by a brief discussion of the results.

Data and sample characteristics

For our study we utilize the 2009-wave of the German Survey on Volunteering (GSV); a large-scale survey (N=20,000) on volunteering and civic engagement among individuals aged 14 and older. The sample was drawn through random-digit-dialing and stratified according to state size, thus, it is representative of the German-speaking population in Germany (Müller et al., 2013). Given the selection of core variables of interest, this study looks at respondents that in a broad sense considered themselves being a volunteer (defined as "having responsibilities that are done voluntarily without being paid" in activities like sports or welfare associations, arts, culture or education). Respondents were selected based on two survey criteria. First, respondents were asked whether they participate in activities of public life outside work and family life. Second, respondents could indicate whether they are active, without pay and out of free choice, in associations, initiatives or self-help groups. It is important to mention that this is a broader definition than the four-criterion definition of Cnaan et al. (1996). In the definition of the GVS no assumptions can be made on whether the volunteer activities are really intended for beneficiaries outside the personal environment of the volunteer. Applying both selection criteria, which together capture three out of the four criteria of Cnaan et al. (1996), resulted in a useable sample of N= 7,023 volunteers. These volunteers are pursuing volunteer work in various activities and organizational types and come with various backgrounds, as well as - most importantly - with different volunteer expectations, volunteer motives, volunteer skills/requirements as well as general values. With this broad and heterogeneous sample we performed a cluster analysis.

Variables

Volunteering-related Variables:

Volunteer Life Values: Participants were asked about the importance of values in their lives, offering them 12 items (e.g. "having power and influence"). Response options were presented as 5-point Likert-type rating scale (1: not important to 5: very important). Volunteer Motives: Participants were asked about things they expect to get when doing volunteer work. The scale contained 10 items (e.g. "helping others") and response options were offered as 5-point Likert-type rating scale (1: not important to 5: very important)[1]. Skill Requirement: Participants were asked about the skills necessary for pursuing their volunteer work. The scale had 10 items (e.g. leadership quality) and response options were 1: to a large extent, 2: to some extent, 3: not at all. Tasks: Participants were asked about the main content of their volunteer work. Response options were 1=yes and 0=no for 11 tasks: 1: personal assistant/support, 2: organization and implementation of aid

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[1] Besides, the motives scale used here, the GSV contains another scale asking participants about their motives (5 items, e.g. Through my volunteer work, I want to get together with others, response categories 1: totally agree, 2: partially agree, 3: disagree). We performed EFA and CFA on this scale and were not able to establish factorial property drawing on the criteria outline in the paper. This scale was hence not used in the analysis.

projects, 3: organization and implementation of meetings and events, 4: counseling, 5: pedagogical guidance of groups, 6: interest groups and participation, 7: PR and outreach work, 8: administrative duties, 9: practical work that has to be done, 10: network work, 11: Fundraising.

<u>Socio-demographic Variables</u>

<u>Age</u> is a continuous variable measuring participants' year of birth. <u>Gender</u> is dichotomized for female and male (female = 0, male = 1). <u>Employment status</u> indicates the main activity participants were pursuing. Response choices were: 1=employed, 2: unemployed, 3: student (both apprenticeship and university), 4: housewife/man, 5: retired, 6: army service, 7: civil service (as substitute for army service), 8: Other. Employment status was recoded for analysis to "employed"; category 1 was recoded into 1=yes and categories 2 to 8 were recoded into 0=no. The GSV assessed <u>immigrant status</u> (1=yes, 0=no) defined as individuals not born in Germany and/or who do not hold German citizenship / or hold German citizenship but not since birth (Müller et al., 2013). Participants were asked about the highest <u>level of education</u> they had completed with the following response options: 1: graduation after 8th grade/lower secondary education, 2: graduation after 10th grade/highschool diploma, 3: advanced technical certificate, 4: Abitur [secondary school leaving examination]/graduation after 12th grade, 5: university degree (no differentiation between undergrad/grad), 6: no school certificate. For analysis, we recoded this variable into a variable "university education" (yes=1, no=0).

<u>Religiosity:</u> Participants were asked "Do you belong to a religious confession or congregation?" with response options being 1: yes and 2: no. <u>Financial situation:</u> Participants were asked about their financial situation with available response options 1: very good, 2: good, 3: ok, 4: bad, 5: very bad. This variable was recoded into a dummy variable "good finances"; categories 1, 2 and 3 were recoded into 1=yes and categories 4 and 5 into 0=no. <u>Urban living area:</u> The GSV assessed if participants lived urban areas (1=yes, 0=no). Urban areas were defined as having a population density above 100.000 inhabitants or more (BIK, 2001). <u>Social cohesion:</u> Participants were asked about their perceptions of the social cohesion in their neighborhood (1: very good, 2: good, 3: ok, 4: bad, 5: very bad). Initial answers were recoded into a dummy variable "Social Cohesion" (1=yes, 0=no), whereby categories 1 to 3 were recoded into yes=1 and answer categories 4 and 5 into no=0. <u>Donation behavior:</u> Participants were asked if they had been donating money for a good cause in the past 12 months (yes=1, no=0). <u>Organizational membership:</u> Participants were asked if they are a member of an organization or association. Participants were able to choose out of 9 categories (e.g. sports association). Based on their answers, a dummy variable "organizational member" (1=yes, 0=no) has been generated.

<u>Analysis 1: Exploratory and Confirmatory Factor Analysis and Cluster Analysis</u>

As the basis for a cluster analysis, factorial properties have to be established through exploratory and confirmatory factor analyses using our key variables of interest. To analyze the dimensionality of the volunteer life values, skills requirements, and volunteer motives scales, we randomly split the full sample (N =

7023) into two; exploratory common factor analysis was done on the first (N=3,512), confirmatory analysis on the second half of the sample (N=3,511). Common factor analysis with squared multiple correlations as initial communality estimates were applied for two to six factor models rotated according to varimax, equamax, and promax criteria for the scales (Snook & Gorsuch, 1989). Each model was evaluated for its ability to produce dimensions that (a) satisfy the minimum constraints for Cattell's scree test (Cattell, 1966), Velicer's minimum-average partialing test (MAP; Velicer, 1976) and (b) retain at least three items with salient loadings, where loadings of at least 0.40 are considered salient; (c) yield high internal consistency ($\alpha \geq 0.70$); (d) remain invariant across models; (e) produce the highest hyperplane count (Yates, 1987) and (f) make theoretical sense in terms of parsimonious coverage (i.e. mutually exclusive assignment of items to factors, maximum numbers of items retained) (Gorsuch, 1983).

After having established their factorial properties, the three dimensions volunteer life values, skills requirements, and volunteer motives were used as profile variables to form clusters. To determine the ideal number of clusters, we applied multiple criteria; specifically (a) atypical decrease in overall between-cluster variance (R^2) and increase in within-cluster variance (Ward, 1963) with no reverse trend at subsequent steps, (b) simultaneous elevation of the pseudo-F statistic over pseudo-t^2 statistic (Caliński & Harabasz, 1974; Duda & Hart, 1973)[2], and (c) peak in the cubic clustering criterion (> 3.0; Sarle, 1983). In a final step and to support the validity of the final typology, various internal and external variables were used to characterize the clusters. Deviations in the expected prevalence of the variables (see section above) within each profile type were determined using Analyses of Variance (ANOVA) and Chi^2-tests.

Results Analysis 1:

Exploratory Factor Analysis (EFA): Iterative factor solutions were tested for one to six factors for all three constructs of interest (volunteer life values, volunteer motives and skills requirements) and assessed against the stated criteria. Interestingly, for each of these three dimensions of interest, one-factor solutions were superior and satisfied all criteria. Models with more factors produced factor scores with unsatisfactory internal consistency or only two salient items. Salience was found for all items on the skills requirements, and volunteer motives scales, and for seven of the twelve volunteer life values items. Internal consistency was high (respective Cronbach's alpha values are 0.70 for volunteer life values, 0.79 for volunteer motives, and 0.82 for skills requirements). The final factor solution as well as component items, factor loadings, item-total correlations, and internal consistencies are shown in Table 1.

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[2] The Pseudo *F* statistic indicates separation among *all* clusters at the current step. The Pseudo *t*-squared statistic indicates separation of the *two clusters* just joined at the current step.

Table 1. Exploratory common factor analysis

Variables	Promax loading	Item-total r^a		Promax loading	Item-total r^a		Promax loading	Item-total r^a
Skills Requirement (α=.82)			**Volunteer Life Values (α=.70)**			**Volunteer Motives (α=.80)**		
1: talent for organization	0.64	0.56	1: be hardworking and ambitious	0.58	0.48	1: to do something for society/common good	0.48	0.44
2: leadership quality	0.67	0.59	2: have a high standard of living	0.56	0.53	2: to help others	0.47	0.43
3: high willingness/readiness for action	0.63	0.56	3: having power and influence	0.46	0.39	3: to advocate for own interests	0.42	0.36
4: content/expert knowledge	0.48	0.44	4: to develop personal phantasy and creativity	.	.	4: to have fun	0.57	0.49
5: be good in handling people	0.55	0.48	5: aim for security	0.56	0.47	5: to meet people who you like	0.53	0.45
6: be good in handling authorities/administration	0.44	0.39	6: helping socially disadvantaged and minorities	.	.	6: to enhance own knowledge and experiences	0.66	0.56
7: resilience	0.64	0.58	7: to enforce individuals needs against others	0.49	0.42	7: to have responsibilities and decision making competencies	0.62	0.53
8: selflessness/altruism	0.47	0.42	8: respecting law and order	0.41	0.29	8: to find recognition	0.5	0.42
9: creativity	0.53	0.48	9: tolerating opinions that are not agreeable	.	.	9: to bring in your own knowledge and experiences	0.63	0.54
10: good time management	0.61	0.53	10: engage politically	.	.	10: to be together with people from other generations	0.52	0.48
			11: to enjoy good things in life	0.4	0.32			
			12: to support protection of the environment	.	.			

Note: Entries are rounded to two decimals. Exploratory common factor analysis was performed on a random subsample of the data set (N=3512). Items are abbreviated for convenient presentation.
a Values are Pearson product-moment-correlations, with the respective item excluded from total factor score

Table 2. Description of Clusters

Measures	Mean	Cluster 1 (n=1587)	Cluster 2 (n=1377)	Cluster 3 (n=1380)	Cluster 4 (n=740)	Cluster 5 (n=1014)	Cluster 6 (n=637)	Sig. Test
Age (in years)	46.22	44.13	46.39	46.48	47.61	43.87	47.56	$F_{(5, 6724)}=10.12, p \leq .0001$
Male	46.86%	52.11%	41.25%	45.14%	50.14%	46.25%	48.19%	$X^2_{(5)}=40.34, p \leq .0001$
Employment status	54.90%	58.48%	52.22%	57.22%	55.14%	52.37%	57.14%	$X^2_{(5)}=18.09, p=.003$
Urban	64.00%	65.15%	65.14%	62.68%	58.78%	63.21%	68.60%	$X^2_{(5)}=17.60, p=.003$
Cohesion	92.04%	90.62%	94.08%	91.24%	91.91%	92.99%	91.85%	$X^2_{(5)}=14.50, p=.013$
Good financial situation	82.42%	84.69%	85.23%	79.90%	79.95%	80.91%	85.53%	$X^2_{(5)}=27.91, p \leq .0001$
Donated	66.74%	67.82%	65.80%	67.08%	66.58%	61.44%	72.51%	$X^2_{(5)}=23.65, p \leq .0001$
University education	27.18%	33.76%	27.37%	29.73%	20.17%	15.48%	32.24%	$X^2_{(5)}=125.64, p \leq .0001$
Organizational membership	62.32%	62.51%	56.32%	70.22%	70.14%	58.63%	55.10%	$X^2_{(5)}=97.03, p \leq .0001$
Religious	63.44%	63.97%	65.29%	64.54%	59.19%	63.21%	62.42%	$X^2_{(5)}=8.97, p=.110$

Note: Values are mean scores for age otherwise percentages. Significant differences are italicized.

Table 3: Canonical Loadings and Estimated Redundancy of Tasks on Motives

	Canonical Structure Loadings							
Motives	**Variate pair 1**	**Variate pair 2**	**Variate pair 3**	**Variate pair 4**	**Variate pair 5**	**Variate pair 6**	**Variate pair 7**	**Variate pair 8**
doing sth. for society	*0.46*	0.13	0.24	*-0.45*	*0.47*	*-0.51*	-0.14	-0.08
be together with other generations	0.33	-0.26	0.31	0.20	0.25	-0.26	-0.29	0.16
helping others	*0.70*	*-0.49*	0.26	-0.36	0.18	0.05	-0.03	-0.15
advocating for own interests	0.37	*0.47*	*0.49*	-0.04	*-0.54*	0.08	-0.18	-0.12
having fun	0.27	-0.14	*0.42*	*0.54*	-0.02	*-0.42*	-0.31	-0.11
meeting people one likes	0.00	0.01	*0.87*	0.32	0.31	0.06	0.09	-0.06
enhance own knowledge	*0.64*	0.08	0.30	0.28	-0.17	-0.29	*0.46*	0.28
having decision making competencies	*0.59*	0.32	0.16	0.28	0.29	0.20	-0.04	*0.45*
find recognition	0.28	0.19	0.20	0.26	0.14	-0.06	*0.41*	-0.34
bring in own knowledge	*0.72*	0.23	-0.05	*0.42*	0.24	0.04	-0.07	-0.35
Percent of variance	85.16%							
Redundancy (Percentage of tasks explained by motives)	4.45%							

Tasks	**Variate pair 1**	**Variate pair 2**	**Variate pair 3**	**Variate pair 4**	**Variate pair 5**	**Variate pair 6**	**Variate pair 7**	**Variate pair 8**
Personal support	*0.48*	*-0.65*	0.27	-0.28	-0.04	0.15	0.26	0.01
networking	*0.40*	0.34	-0.18	0.07	0.27	0.20	*0.57*	-0.25
Fundraising	0.30	0.18	0.11	-0.20	*0.65*	0.04	-0.39	-0.23
Organization of aid projects	*0.45*	-0.06	0.25	-0.37	0.25	0.03	-0.07	0.00
Organization of meetings/events	-0.06	0.32	*0.77*	0.18	0.23	0.25	0.18	-0.17
Counseling	*0.65*	-0.02	-0.22	0.13	0.09	0.12	-0.01	-0.17
Pedagogical guidance of groups	*0.51*	-0.04	0.21	*0.67*	-0.07	0.09	-0.20	0.34
interest groups and participation	*0.47*	*0.61*	0.17	*-0.42*	-0.24	0.30	-0.06	0.13
PR and outreach work	*0.50*	*0.47*	0.18	-0.09	0.32	*-0.52*	0.27	0.06
administrative duties	0.01	0.24	-0.21	-0.06	*0.65*	*0.41*	0.11	*0.49*
practical work that has to be done	0.07	-0.13	0.23	-0.24	0.15	-0.17	0.14	*0.45*
Percent of variance	77.73%							
Redundancy (Percentage of tasks explained by motives)	3.76%							
Canonical correlation	0.36****	0.23****	0.18****	0.16****	0.13****	0.10****	0.08****	0.05*

Note: Canonical correlations ≥ .40 are considered substantial and are italicized. N = 6600. Values are rounded to two decimals. *$p ≤ .05$, **$p ≤ .01$, ***$p ≤ .001$, ****$p ≤ .0001$

It was surprising to find only unidimensional solutions for the three scales (dimensions of interest). This is in strong contrast to prior research. Looking at volunteer motives as one example, prior research finds six to seven sub-dimensions of volunteer motives, such as career or values motive to volunteer (Clary et al., 1998; Willems & Walk, 2013). Unidimensional scales only allow us to cluster on a range from low to high assuming that the items are measuring similar elements. This is unexpected, considering that the items seem to tap onto different concepts. For instance, the volunteer motives scale contains items such as 'helping others' and 'having fun'. The former seems to be an other-oriented motives, whereas the later assesses a more self-oriented motive (Konrath, Fuhrel-Forbis, Lou, & Brown, 2012). With this limitation in mind, we continued with a cluster analysis for exploratory purposes.

Cluster Analysis: The 6-cluster solution produced the highest cubic clustering value and simultaneously satisfied the pseudo-F over pseudo-t^2 statistic. The clusters have different sizes and differ on most of the variables, except for religiousness. Table 2 presents the overall mean scores for each of the 6 profile types as well as results of ANOVAs and Chi^2 tests.

As shown in Table 2, the clusters seem to differ on a range of socio-demographic variables. However, the three scales provide only limited ability to differentiate the volunteers in the sample. Therefore, we attempted to further investigate the relationships between the individual items focusing on volunteer motives and volunteer tasks using canonical correlation analysis.

Analysis 2: Canonical correlation analysis

To investigate the (bi-multivariate) relationships between the volunteer motives and volunteer tasks, canonical regression analyses were applied (Miller & Farr, 1971; Wollenberg, 1977). First, an overall test of the significance of the relationship between volunteer motives and volunteer tasks was explored. Second, the canonical structure was examined to understand the relationships among the variables. Specifically the number of significant variate pairs was determined and subsequently the nature of the variate pairs was examined. Given the set-up of the GSV, we used single items instead of latent variables to conduct our analysis. The task scale has a binary response option (1=yes, 0=no).

The predictor variable set tasks consisted of 11 items (see variable description above), the criterion variable set motives consisted of 10 items (1: to do something for society/common good, 2: to help others, 3: to advocate for own interests, 4: to have fun, 5: to meet people who you like, 6: to enhance own knowledge and experiences, 7: to have responsibilities and decision making competencies, 8: to find recognition, 9: to bring in your own knowledge and experiences, 10: to be together with people from other generations). This procedure provides the advantage of control for the correlations among criterion measures and of Type I error and enables a more parsimonious assessment of the bi-multivariate overlap of the predictors and criteria. The analysis discovered that eight of the ten possible canonical relationships were significant ($R_{c1} = 0.36$, p < 0.0001; $R_{c2} = 0.23$, p < 0.0001; $R_{c3} = 0.18$, p < 0.0001; $R_{c4} = 0.16$, p < 0.0001; $R_{c5} = 0.13$, p < 0.0001; R_{c6}

=0.10, p < 0.0001; R_{c7} =0.08, p < 0.0001; R_{c8} =0.05, p =0.0140)[3]. The overall relationships of the predictors with the criterion variables yield a Wilks' *Lambda* = 0.75, where the multivariate $F(110, 49246) = 17.64$, $p < 0.0001$[4]. The canonical loadings and estimated redundancies[5] are shown in Table 3.

Together, the eight canonical variates account for 85.16% of the variance in the set of motives and for 77.73% of the variance in the set of motives. Additionally, canonical redundancy indicates that motive (4.45%) and task (3.76%) dimensions explain small amounts of redundancy, whereby most of the variability in either source is independent of the other.

The eight canonical correlations are diverse and need to be further discussed and classified, if they are robust across sub-samples. This analytic step is presented next.

<u>Analysis 3: test the robustness of canonical structure over subsets of the sample</u>

Building on our finding of eight canonical relationships in the data, we performed certain checks for robustness for certain subsamples. In particular, we split the sample according to employment status (working, 1=yes, 0=no; N=3,688), male (1=yes, 0=no; N=3,098), and according to certain age groups (younger volunteers aged 14-34, N=1862; older volunteers aged 59 and older, N=1,591). Results can be found in tables 4, 5, 6 and 7.

For those <u>employed</u>, we find seven canonical correlations (R_{c1} = 0.35, p < 0.0001; R_{c2} = 0.23, p < 0.0001; R_{c3} = 0.19, p < 0.0001; R_{c4} = 0.18, p < 0.0001; R_{c5} =0.16, p < 0.0001; R_{c6} =0.12, p < 0.0001; R_{c7} =0.09, p < 0.0032 with Wilks' *Lambda* = 0.73, where the multivariate $F(110, 27455) = 10.58$, $p < 0.0001$), for <u>men</u> we also find seven significant canonical correlations (R_{c1} = 0.39, p < 0.0001; R_{c2} = 0.25, p < 0.0001; R_{c3} = 0.22, p < 0.0001; R_{c4} = 0.16, p < 0.0001; R_{c5} =0.13, p < 0.0001; R_{c6} =0.10, p < 0.0001; R_{c7} =0.09, p < 0.0018 with Wilks' *Lambda* = 0.71, where the multivariate $F(110, 23040) = 9.81$, $p < 0.0001$). When looking at the <u>age</u> groups, we find five canonical correlations for the younger (R_{c1} = 0.38, p < 0.0001; R_{c2} = 0.28, p < 0.0001; R_{c3} = 0.21, p < 0.0001; R_{c4} = 0.17, p < 0.0001; R_{c5} =0.16, p < 0.0001 with Wilks' *Lambda* = 0.70, where the multivariate $F(110, 13790) = 6.18$, $p < 0.0001$) and older (R_{c1} = 0.38, p < 0.0001; R_{c2} = 0.25, p < 0.0001; R_{c3} = 0.22, p < 0.0001; R_{c4} = 0.16, p < 0.0001; R_{c5} =0.14, p < 0.0054 with Wilks' *Lambda* = 0.71, where the multivariate $F(110, 11762) = 4.96$, $p < 0.0001$) volunteers.

Despite the fact, however, that the number of significant relationships seems to be mostly similar, we were <u>unable</u> to identify similar patterns between volunteer motives and volunteer tasks, indicating that the initial solution is neither generalizable nor sufficiently robust to sub-sets of the data. To some extent, we were

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[3] R_c represents the canonical correlation and are interpreted the same as Pearson's r; their square is the percent of variance in the canonical variate of one set of variables explained by the canonical variate for the other set along the dimension represented by the given canonical correlation (Tabachnik & Fidell, 2001).

[4] Wilks's lambda is used to test the significance of the first canonical correlation. If p≤.05, the two sets of variables are significantly associated by canonical correlation.

[5] Redundancy in a canonical variate is the percentage of variance it extracts from its own set of variables times the squared canonical correlation of the pair (Tabachnik & Fidell, 2001).

able to identify overlapping items, but none of the eight previously identified canonical variate pairs in the general population could be replicated using sub-samples of age, male gender and employment status.

Table 4: Canonical Loadings and Estimated Redundancy of Tasks on Motives for employed portion of sample

	Canonical Structure Loadings						
Motives	**Variate pair 1**	**Variate pair 2**	**Variate pair 3**	**Variate pair 4**	**Variate pair 5**	**Variate pair 6**	**Variate pair 7**
doing sth. for society	0.39	-0.20	*0.47*	0.17	*0.42*	*-0.57*	0.19
be together with other generations	0.22	*0.45*	0.18	*0.52*	0.12	-0.31	-0.18
helping others	*0.66*	0.39	*0.58*	-0.05	0.14	-0.08	0.11
advocating for own interests	0.35	*-0.44*	0.23	*0.49*	*-0.57*	0.08	-0.09
having fun	0.10	0.34	-0.09	*0.60*	-0.12	-0.48	0.03
meeting people one likes	-0.17	0.22	0.32	*0.80*	0.12	0.18	0.24
enhance own knowledge	*0.58*	0.11	-0.12	*0.42*	-0.20	-0.07	*0.41*
having decision making competencies	*0.52*	-0.09	-0.11	*0.54*	0.34	0.13	-0.16
find regocnition	0.24	-0.01	-0.16	*0.43*	0.10	0.11	*0.55*
bring in own knowledge	*0.68*	0.04	-0.35	0.39	0.22	0.05	-0.03
Percent of variance	71.89%						
Redundancy (Percentage of tasks explained by motives)	3.78%						
Tasks	**Variate pair 1**	**Variate pair 2**	**Variate pair 3**	**Variate pair 4**	**Variate pair 5**	**Variate pair 6**	**Variate pair 7**
Personal support	*0.41*	*0.50*	*0.54*	-0.18	-0.05	0.19	0.24
networking	*0.42*	-0.24	-0.18	0.11	0.16	*0.53*	*0.41*
Fundraising	0.30	-0.24	0.30	0.17	*0.54*	-0.08	-0.20
Organization of aid projects	*0.42*	0.05	*0.50*	-0.07	0.20	-0.12	0.07
Organization of meetings/events	-0.13	-0.15	*0.41*	*0.75*	-0.05	0.31	0.16
Counseling	*0.66*	0.08	-0.12	0.03	0.03	0.21	-0.01
Pedagogical guidance of groups	*0.44*	0.41	-0.18	*0.57*	-0.06	-0.01	-0.38
interest groups and participation	*0.51*	*-0.68*	0.33	0.05	-0.22	0.20	-0.21
PR and outreach work	*0.47*	*-0.40*	0.03	0.34	0.29	-0.30	*0.50*
administrative duties	-0.02	-0.19	0.01	0.02	*0.77*	0.42	-0.18
practical work that has to be done	-0.02	0.06	*0.48*	0.05	0.06	-0.04	0.03
Percent of variance	81.00%						
Redundancy (Percentage of tasks explained by motives)	4.22%						
Canonical correlation	0.35****	0.23****	0.19****	0.18****	0.16****	0.12****	0.09**

Note: Canonical correlations ≥ .40 are considered substantial and are italicized. N = 3688. Values are rounded to two decimals. *p≤.05, **p≤.01, ***p≤.001, ****p≤.0001

Table 5: Canonical Loadings and Estimated Redundancy of Tasks on Motives for male sub-sample

	Canonical Structure Loadings						
Motives	**Variate pair 1**	**Variate pair 2**	**Variate pair 3**	**Variate pair 4**	**Variate pair 5**	**Variate pair 6**	**Variate pair 7**
doing sth. for society	*0.52*	*0.41*	0.22	-0.24	0.36	-0.24	*-0.44*
be together with other generations	*0.42*	-0.09	0.36	0.31	0.16	-0.06	*-0.49*
helping others	*0.81*	-0.27	0.25	-0.36	0.14	0.09	-0.13
advocating for own interests	0.35	*0.46*	0.22	0.03	*-0.76*	0.04	0.00
having fun	0.32	-0.10	0.26	*0.66*	-0.20	-0.15	-0.30
meeting people one likes	0.09	0.12	*0.80*	0.44	0.04	0.20	0.15
enhance own knowledge	*0.63*	0.13	0.15	0.29	-0.06	*-0.50*	*0.45*
having decision making competencies	*0.51*	*0.40*	0.18	0.25	0.13	0.19	0.13
find recognition	0.27	0.28	0.18	0.21	0.12	0.01	0.13
bring in own knowledge	*0.68*	0.23	-0.29	*0.49*	0.13	0.28	0.01
Percent of variance	78.90%						
Redundancy (Percentage of tasks explained by motives)	5.30%						

Tasks	**Variate pair 1**	**Variate pair 2**	**Variate pair 3**	**Variate pair 4**	**Variate pair 5**	**Variate pair 6**	**Variate pair 7**
Personal support	*0.56*	*-0.55*	0.33	-0.29	-0.07	0.05	0.19
networking	0.34	0.29	-0.21	-0.02	0.33	0.21	*0.51*
Fundraising	0.33	0.34	0.18	0.00	*0.43*	0.36	-0.33
Organization of aid projects	*0.53*	0.12	0.36	-0.34	0.12	0.09	-0.19
Organization of meetings/events	-0.02	0.37	*0.70*	0.25	-0.08	0.27	0.26
Counseling	*0.60*	0.01	-0.21	0.14	0.18	0.14	0.08
Pedagogical guidance of groups	*0.50*	-0.06	0.03	*0.69*	-0.09	0.14	0.15
interest groups and participation	0.44	*0.64*	-0.02	-0.30	-0.34	0.08	0.25
PR and outreach work	*0.47*	*0.54*	0.16	0.04	0.36	*-0.49*	0.04
administrative duties	*-0.03*	0.28	0.10	-0.16	*0.65*	0.29	0.34
practical work that has to be done	0.17	-0.13	*0.42*	0.00	0.17	-0.37	0.25
Percent of variance	72.07%						
Redundancy (Percentage of tasks explained by motives)	4.49%						
Canonical correlation	0.39****	0.25****	0.22****	0.16****	0.13****	0.10****	0.09**

Note: Canonical correlations ≥ .40 are considered substantial and are italicized. N = 3098. Values are rounded to two decimals. *p≤.05, **p≤.01, ***p≤.001, ****p≤.0001

Table 6: Canonical Loadings and Estimated Redundancy of Tasks on Motives for Volunteers <35

	Canonical Structure Loadings				
Motives	**Variate pair 1**	**Variate pair 2**	**Variate pair 3**	**Variate pair 4**	**Variate pair 5**
doing sth. for society	*0.51*	0.23	-0.22	0.25	-0.33
be together with other generations	*0.42*	-0.17	0.16	0.28	0.22
helping others	*0.76*	-0.27	-0.18	*0.40*	0.08
advocating for own interests	0.37	*0.59*	-0.20	0.13	0.02
having fun	0.30	-0.08	*0.53*	0.03	-0.38
meeting people one likes	0.00	0.23	*0.59*	*0.69*	0.02
enhance own knowledge	*0.60*	0.11	0.31	0.10	*-0.45*
having decision making competencies	*0.50*	0.37	*0.44*	0.07	0.21
find recognition	0.20	0.18	0.15	*0.40*	-0.24
bring in own knowledge	*0.61*	0.35	0.48	-0.24	0.02
Percent of variance	58.97%				
Redundancy (Percentage of tasks explained by motives)	4.90%				

Tasks	**Variate pair 1**	**Variate pair 2**	**Variate pair 3**	**Variate pair 4**	**Variate pair 5**
Personal support	*0.62*	*-0.51*	-0.09	*0.48*	-0.07
networking	0.25	0.38	0.29	-0.09	-0.24
Fundraising	0.27	0.26	-0.04	0.08	0.23
Organization of aid projects	*0.49*	0.18	-0.16	0.31	0.22
Organization of meetings/events	-0.10	*0.53*	0.33	*0.55*	0.13
Counseling	*0.59*	0.00	0.06	*-0.45*	-0.03
Pedagogical guidance of groups	*0.47*	0.02	*0.72*	-0.05	0.28
interest groups and participation	*0.46*	*0.66*	-0.41	0.04	0.25
PR and outreach work	*0.41*	*0.49*	0.05	0.09	*-0.56*
administrative duties	-0.01	0.18	0.04	-0.12	*0.44*
practical work that has to be done	0.14	0.01	-0.06	0.22	0.00
Percent of variance	56.64%				
Redundancy (Percentage of tasks explained by motives)	4.41%				
Canonical correlation	0.38****	0.28****	0.21****	0.17****	0.16****

Note: Canonical correlations ≥ .40 are considered substantial and are italicized. N =1862. Values are rounded to two decimals. *p≤.05, **p≤.01, ***p≤.001, ****p≤.0001

Table 7: Canonical Loadings and Estimated Redundancy of Tasks on Motives for Volunteers >59

	Canonical Structure Loadings				
Motives	**Variate pair 1**	**Variate pair 2**	**Variate pair 3**	**Variate pair 4**	**Variate pair 5**
doing sth. for society	*0.57*	0.12	0.04	*0.53*	0.31
be together with other generations	*0.46*	-0.08	0.30	-0.04	0.11
helping others	*0.55*	*-0.49*	*0.50*	0.39	0.11
advocating for own interests	*0.43*	0.34	0.33	*-0.46*	-0.20
having fun	0.32	0.06	*0.45*	-0.28	*0.60*
meeting people one likes	0.09	*0.53*	*0.74*	0.19	0.17
enhance own knowledge	*0.61*	0.18	0.43	-0.08	-0.36
having decision making competencies	*0.70*	0.20	0.00	0.06	-0.13
find recognition	*0.44*	0.18	0.06	-0.14	-0.06
bring in own knowledge	*0.82*	0.12	0.03	-0.05	0.36
Percent of variance	64.64%				
Redundancy (Percentage of tasks explained by motives)	5.63%				

Tasks	**Variate pair 1**	**Variate pair 2**	**Variate pair 3**	**Variate pair 4**	**Variate pair 5**
Personal support	0.22	*-0.60*	*0.57*	0.24	-0.33
networking	*0.56*	0.00	-0.38	0.38	-0.23
Fundraising	*0.41*	0.17	-0.05	*0.51*	*0.54*
Organization of aid projects	*0.46*	-0.05	0.22	0.38	0.28
Organization of meetings/events	0.12	*0.58*	*0.45*	0.19	-0.03
Counseling	*0.65*	-0.24	-0.06	-0.04	0.15
Pedagogical guidance of groups	*0.54*	-0.09	0.14	*-0.60*	0.21
interest groups and participation	*0.63*	*0.47*	0.02	0.09	-0.28
PR and outreach work	*0.67*	0.38	-0.07	0.16	-0.07
administrative duties	0.14	0.14	*-0.45*	0.25	-0.06
practical work that has to be done	0.11	-0.05	0.09	0.16	0.03
Percent of variance	56.86%				
Redundancy (Percentage of tasks explained by motives)	4.58%				
Canonical correlation	0.38****	0.25****	0.22****	0.16****	0.14**

Note: Canonical correlations $\geq$ .40 are considered substantial and are italicized. N =1591. Values are rounded to two decimals. *p$\leq$.05, **p$\leq$.01, ***p$\leq$.001, ****p$\leq$.0001

Discussion, Conclusion and Avenues for further research

With this article we aimed at two research objectives: (1) identify and describe a set of relevant, robust and distinct types of volunteers to enable better generalizability and targeted recommendations, and (2) derive insights in differentiation strategies to optimally manage each type of volunteers. We performed several data-driven analyses in order to answer our research questions. We conducted an exploratory factor analysis, a cluster analysis and a canonical correlation analysis to respectively derive volunteer types and get insights in the potential strategies that would be relevant for each of these types. Despite the promising sample (n = 7,023), being heterogeneous and representative for the full German population of volunteers, we were unable to answer our research questions and reach robust findings. In general, the multivariate characteristics of the concrete items and constructs probed for by the German Survey on Volunteering (GSV) do not meet the basic methodological assumptions and requirements for our analyses, which hampers us to make appropriate interpretations about the results. As a result, we endorse Priller (2010), who argues that the German Volunteer Survey and other large-scale surveys are by far not sufficient to answer all pertinent questions in the area of volunteer research. This urges us to discuss some substantial limitations with respect to the usefulness of this data to deal with our particular research questions. Evidently, we acknowledge that the data was not collected with the particular aim to answer our research questions. However, from discussing the limitations regarding the data for our research aim, we can propose avenues for further research and suggestions for further data collection.

First, the items within the relevant dimensions that we identified (or survey scales) had on the one hand a sufficient level of item covariances to group them in single dimensions respectively. On the other hand, however, these unidimensional constructs had only little explained variance of all the items they respectively encompassed. For example, the unidimensional motives construct did not explain more than 35% of all the item variances. Furthermore, grouping all motive items, each probing for conceptually different elements, gives little useful information to reach distinct volunteer types and adjusted differentiated strategies. Especially because previous research confirms multiple motive dimensions (e.g. Clary & Snyder, 1998; Willems & Walk, 2013). Therefore, for this dimension we were only able to classify volunteers in a very general way: motivated versus not motivated volunteers. This lack of discriminant validity (in case items should be used to compare them against each other, e.g. in a detailed cluster analysis or a canonical correlation analysis), or convergence validity (to combine them in one dimension), is probably due to the concrete format of how questions were asked in the survey. Our main recommendation therefore is that such items only have value to be asked when they either are designed and asked to measure distinct elements, or to enhance validity regarding one single latent concept.

Second, given our aim we selected dimensions and criteria from the overall GSV questionnaire that in our view best corresponded to relevant elements to look at for sound cluster and canonical correlation analyses. As a result, we limited ourselves substantially regarding the universe of potential relevant criteria to

cluster and describe volunteer types, and even more for deriving characteristics of differentiated management strategies. In this context we surely acknowledge that for a nationwide and representative survey (useful for a sound cluster analysis) it is unrealistic and too costly to incorporate even more dimensions and items that might be relevant for describing all potential management strategies. Due to this natural constraint, further research seems to be inherently limited to focus either on identifying different volunteer types based on very specific subdomains of volunteer strategies (as we in fact did: 'required skills' as the only potential content of strategy differentiation, while actual strategies in reality are much broader), or focus on a multitude of strategies for a particular type of volunteers (as we mentioned in our introduction, this is what most existing studies have done). However, when combining the best of both perspectives, a substantial gap could be filled when for the many recommendations that exist a more elaborate framing is done regarding the particular volunteer types that these recommendations apply to. As we failed to provide a sound data-driven classification of volunteers, we believe it is still worth to evaluate recommendations based on the seminal existing, though not data-driven classification by Cnaan, Handy and Wadsworth (1996). For focussed contributions (i.e. for a praticular type of volunteers) researchers could explain how their recommendations are dependent on (1) free choice, (2) volunteer remuneration, (3) (in)formality of the volunteer context, and (4) is intendend for beneficieres outside the personal environment of the volunteer. Furthemore, dependency on other dimensions could in addition and continuously be discussed and further explored.

In this context, we want to mention that the choice of variables from the GVS might not be the most optimal to answer our research question. From feedback on an earlier version of this paper, several contextual factors emerged that suggest avenues for further research and that might explain the non-findings of our study from a more substantive point of view. As we focussed on volunteers in Germany, particularities of this context should be taken into account in further research. For example, the level of professionalism in various volunteering contexts might moderate the relevance of the management-oriented concepts that we focussed on. Furthermore, the concepts that we chose might be directed to a typical service-oriented and managerial perspective on volunteering, while the purpose of the GVS might have been more to provide a picture of the overall type of prosocial and citizenship-driven behavior in society ("Bürgerschaftliches Engagement"). This broader and overall perspective of the survey, might potentially account for the fact that the survey variables used are not appropropriate for the rather organization level concepts that were at the focus of our investigation.

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