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2022-03

Sorvali , J , Kaseva , J , Vainio , A , Verkasalo , M & Peltonen-Sainio , P 2022 , ' Value priorities of the Finnish farmers : Time to stop thinking of farmers as inherently conservative and traditional ' , Journal of Community and Applied Social Psychology , vol. 32 , no. 2 , pp. 212-240 . <https://doi.org/10.1002/casp.2561>

<http://hdl.handle.net/10138/343042>

<https://doi.org/10.1002/casp.2561>

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RESEARCH ARTICLE

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Value priorities of the Finnish farmers—Time to stop thinking of farmers as inherently conservative and traditional

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Funding information

European Commission, Grant/Award Number: LIFE14 CCM/FI/000254

Abstract

Farming communities are becoming more heterogeneous and multifunctional due to various structural and environmental changes. However, it is not known if farmers' values have also become more heterogeneous. We wanted to explore potential heterogeneity in farmers' value priorities in detail across different farmer groups in Finland using the refined Schwartz theory of 19 basic human values. A representative sample of 4,401 Finnish farmers responded to a survey in 2018. The data were analysed with multidimensional scaling, confirmatory factor analysis and one-way analysis of variance. The results show that farmers' values were heterogeneous, and differences were associated with socio-demographic characteristics. Our findings confirmed the motivational continuum structure of values, with the exception of societal-value. Security-societal was the most important value for the Finnish farmers. The theory of 19 values proved useful in uncovering value priorities in detail. The security-societal value is more a part of national identity rather than a personal motivational value in the Finnish farming community. The heterogeneity of farmers' values should be considered in more targeted policy planning.

KEYWORDS

agriculture, farmers, Finland, Schwartz, survey, values

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1 | INTRODUCTION

Currently, agriculture faces challenges related to changes in growing conditions, extreme weather and pest and disease outbreaks, which may severely damage agricultural production and become more severe due to climate change (Hakala, Hannukkala, Huusela-Veistola, Jalli, & Peltonen-Sainio, 2011; Olesen et al., 2012; Peltonen-Sainio, Hakala, & Jauhiainen, 2011; Rötter et al., 2011). Farming communities play a central role in the future sustainability of agriculture. Farming systems have undergone profound changes in recent decades, and further changes, or even a large-scale transformation of agricultural production, will need to be made in future to accommodate environmental, economic and social sustainability targets (Foley et al., 2011). These expectations and associated policies need to be in line with the personal values of target communities in order to be successful (Axsen & Kurani, 2013; Huijts, Molin, & Steg, 2012; Lincoln & Ardoin, 2016; Vainio et al., 2020). However, there is evidence that the recent agricultural policy strategies do not sufficiently resonate with farmers' basic values (Dobricki, 2011).

Farmers have become more heterogeneous, but it is not known if it is reflected in their values. Previous studies have often described farmer communities as homogeneous, traditional and conservative. A study of northern and central European farmers applied the Schwartz's (1992) theory of basic human values and showed that compared to the general population, farmers are less open to change and more conservative, as well as less motivated by self-interest and more with common welfare (Baur, Dobricki, & Lips, 2016). Tradition and continuity were also identified as the core values of Finnish farmers (Niska, Vesala, & Vesala, 2012; Silvasti, 2001). A Swiss study indicated that the most important higher-order value for farmers was conservation, followed by self-transcendence, self-enhancement and openness to change (Dobricki, 2011). Yet, there is some evidence that farmers' values are more heterogeneous than generally thought. For example, Finnish farmers who are rural business owners regard autonomy and economic values as more important than societal or traditional values (Niska, Vesala, & Vesala, 2016). However, more studies are needed to understand the heterogeneity of values in agricultural farming communities.

The aim of this research was to provide an updated analysis of farmers' values, focussing on potential heterogeneity in them. We used the refined theory of basic human values by Schwartz et al. (2012), which proposes a more detailed circular continuum of 19 values instead of the 10 values in the original theory (Schwartz, 1992). This detailed research will update the current understanding of farmers' values and provide a basis for future studies of farmer attitudes and behaviour. The refined theory of 19 basic human values is interesting in the agricultural context because it enables a differentiation between the values supporting possibilities of change in human behaviour. In addition, the study will fill the research gap regarding the connections of Schwartz' basic human values to different demographic variables, attitudes and behaviours, which have been studied widely (Schwartz, 2015), but not in connection with farmers.

We aim to answer the following questions:

1. Can the motivational structure of 19 values as presented in Schwartz's refined theory of basic human values be found among the Finnish farmers?
2. What are the value and higher-order value priorities of the Finnish farmers?
3. Do these value priorities differ according to demographics or farming choices? We then proceed to ask:
4. How do our results relate to other studies on farmer values? And finally:
5. What do our results mean concerning the future transition pathways of agriculture?

2 | BASIC HUMAN VALUES

2.1 | Schwartz' theory of basic human values

Basic human values are defined as 'desirable trans-situational goals, varying in importance, that serve as guiding principles in the life of a person or other social entity' (Rokeach, 1973; Schwartz, 1994). Values have been found to be

hierarchically structured in a similar way across countries: benevolence, self-direction and universalism values were consistently regarded as the most important, while power, tradition and stimulation values were the least important (Schwartz & Bardi, 2001).

Our research is based on the refined theory of 19 basic human values, where 6 (self-direction, power, security, conformity, universalism and benevolence) of the 10 original values were divided for the sake of better explanatory power, and two new values (humility [HUM] and face) were introduced (Table 1).

The values form a circular continuum (Figure 1) presenting compatible and conflicting motivations: the further from each other the two values are in the circle, the more they are in conflict. Figure 1 also shows the four higher-order values: openness to change; self-enhancement; conservation and self-transcendence. These are separated between values with a more personal focus (openness to change and self-enhancement) and those with a social focus (conservation and self-transcendence) and self-protection—anxiety—avoidance (conservation and self-enhancement) and growth—anxiety-free (self-transcendence and openness to change) (Schwartz et al., 2012).

3 | DATA AND METHODS

3.1 | Participants

The survey was conducted in 2018. It was delivered via email to all Finnish farmers who, in 2016, had an email address in the registry of the Finnish Food Authority. The survey was sent to 38,091 (80%) of the total 47,688 of

TABLE 1 The definitions of the 19 basic human values (Schwartz et al., 2012)

Value (abbr.)	Conceptual definition in terms of motivational goals
Self-direction-thought (SDT)	Freedom to cultivate one's own ideas and abilities
Self-direction-action (SDA)	Freedom to determine one's own actions
Stimulation (ST)	Excitement, novelty and change
Hedonism (HE)	Pleasure and sensuous gratification
Achievement (AC)	Success according to social standards
Power-dominance (POD)	Power through exercising control over people
Power-resources (POR)	Power through control of material and social resources
Face (FAC)	Security and power through maintaining one's public image and avoiding humiliation
Security-personal (SEP)	Safety in one's immediate environment
Security-societal (SES)	Safety and stability in the wider society
Tradition (TRA)	Maintaining and preserving cultural, family or religious traditions
Conformity-rules (COR)	Compliance with rules, laws and formal obligations
Conformity-interpersonal (COI)	Avoidance of upsetting or harming other people
Humility (HUM)	Recognising one's insignificance in the larger scheme of things
Benevolence-dependability (BED)	Being a reliable and trustworthy member of the ingroup
Benevolence-caring (BEC)	Devotion to the welfare of ingroup members
Universalism-concern (UNC)	Commitment to equality, justice and protection for all people
Universalism-nature (UNN)	Preservation of the natural environment
Universalism-tolerance (UNT)	Acceptance and understanding of those who are different from oneself

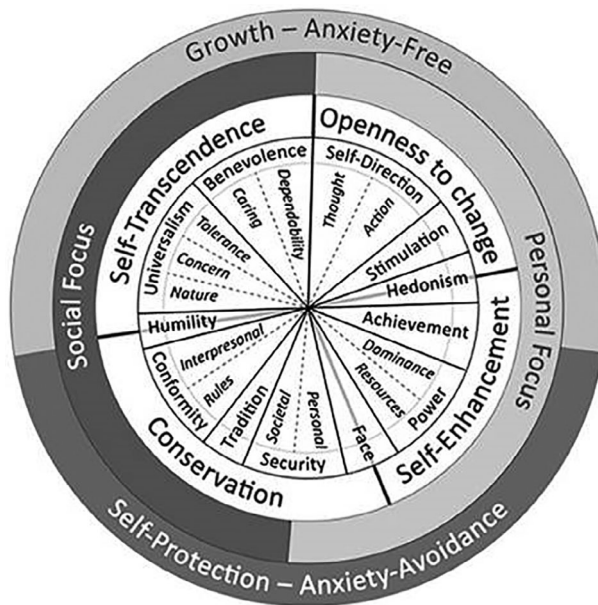


FIGURE 1 The circular continuum of the 19 values (Schwartz et al., 2012)

Finnish farmers in 2018 (Natural Resources Institute Finland, 2019). Twenty per cent of farmers were omitted because they could not be reached via email. Altogether, 4,401 respondents answered, making the response rate 12% of the farmers who were reached and 9% of all Finnish farmers. The value survey was conducted as part of a larger data inquiry concerning farmers' views on farming practices, climate change and the future of agriculture in Finland. The value statements were at the end of the survey. Responding was voluntary and encouraged by the chance to win a drone worth €1,000.

The person mainly responsible for decision-making on the farm was instructed to answer the questions. This resulted in 87% of respondents being male. The respondents were aged between 18 and 78 years ($M = 51.0$ years, standard deviation $[SD] = 11.0$), and the average farm size was 51 ha ($SD = 50.2$). Fifteen per cent were organic farms (Table A1). About a half of the respondents were cereal producers (51%), and the second largest group were dairy farmers (18%). The sample covered all the geographical areas of Finland. About 65% had completed secondary education, and 25% had a university degree. Revenue for agricultural production was €100,000 or less for 66% of respondents ($\bar{x} = €65,000$). No significant distortions of representativeness was found for gender, age, farming system, farm size, farm organisation, farm type or the respondents' geographical area. Our data were interpreted as a fairly representative sample of the Finnish farming community. The respondents seemed to have more vocational schooling than Finnish farmers as a whole. For revenue, our sample was under-presented in the under €20,000 class.

3.2 | Instruments

The revised Portrait Value Questionnaire (PVQ-RR) was used (McQuilkin, Garðarsdóttir, Thorsteinsson, & Schwartz, 2016; Schwartz et al., 2017; Schwartz & Butenko, 2014). Authorized Finnish- and Swedish-language versions of the PVQ-RR were used alongside each other. The PVQ-RR consists of 57 statements or descriptions of goals important to a person (Table A2). Three statements represented each value, and the respondents were asked, 'How much like you is this person?' A 6-point response scale ranging from 1 = 'Not at all like me' to 6 = 'Very much like me' was used.

There were no missing data, but the respondents who used the same scale anchor ≥ 35 times or did not use ≥ 2 scale anchors to 57 questions were removed from the analyses (McQuilkin et al., 2016). The data analysed therefore consisted of 4,160 respondents. The response scale was corrected for scale bias (Schwartz, 2016). The value averages were calculated, and the internal consistencies of the 19 values, measured using Cronbach's alpha, ranged from poor to good (0.52–0.86). HUM and security-personal had poor alphas (< 0.60), but 14 out of 19 values had acceptable alphas (≥ 0.70) (Table A3). The correlation matrix of 19 values is shown in Table A4.

3.3 | Statistical analysis

The structure of values was analysed by multidimensional scaling (MDS) approach. Non-metric MDS with weighted Euclidean distances from a standardized dissimilarity matrix was used. Several optional models were compared, based on graphical solutions and the badness-of-fit-criterion (BOC), which measure how far the total residuals diverge from the real values. Criteria for acceptance vary, but $BOC < 0.15$ is considered a good fit for a 19-variable analysis and $BOC > 0.20$ a poor fit (Borg, Groenen, & Mair, 2018). The chosen model was found extremely suitable, having a BOC value of 0.04. Based on the MDS results, HUM and face were included in conservation in the following confirmatory factor analysis (CFA), which was used to test the structure of four higher-order values. CFAs were performed separately for every higher-order value (Ciecuch & Schwartz, 2012). For example, we received more precise information about each part of the circle, avoided possible disturbances caused by the complexity of the whole model and obtained more reliable test statistics caused by the lower number of estimated parameters. Respondents' raw value scores were used in CFA. As CFA is relatively robust to modest violations of normality with ordinal data, standard CFA was used rather than categorical analysis (Davidov, Datler, Schmidt, & Schwartz, 2011). Only one item out of 57 (SES1; see Table A3) did not pass the assumption of $|\text{skewness}| \leq 2$ and $|\text{kurtosis}| \leq 7$ (Curran, West, & Finch, 1996). The violations were minor (2.3 and 7.2), and we therefore decided to retain the item in the analysis.

Three criteria (comparative fit index [CFI], standardized root mean square residual [SRMR] and root mean square error of approximation [RMSEA]) were used to evaluate the four models' goodness of fit. According to Hu and Bentler (1999), $CFI \geq 0.90$ can be considered an indicator of reasonable fit, and $CFI \geq 0.95$ a good fit, while SRMR and $RMSEA \leq 0.08$ can be considered as indicators of reasonable fit and $RMSEA \leq 0.05$, a good fit. Modification indices were not used to improve models.

The means of the values were calculated and compared across different categories of background variables. A one-way analysis of variance (ANOVA) was used, and pairwise comparisons were based on Tukey's HSD (Salkind, 2010). Effect sizes were evaluated with Hedges' g , which takes account of different sample sizes between groups. The g values above 0.8 were interpreted as large, above 0.5 as medium and above 0.2 as small effects (Ellis, 2010). Statistical analyses were performed through MEANS, UNIVARIATE, CORR, FREQ, ANOVA, GLIMMIX, MDS and CALIS procedures, using the SAS Enterprise Guide 7.15 software package (SAS Institute Inc., Cary, NC).

4 | RESULTS

4.1 | Theory-based value structure in farmer data

First, we analysed the motivational continuum structure of 19 basic human values according to Schwartz's theory (2012) in the data. The MDS analysis supported the continuum structure of values except with security-societal, which was positioned almost at the opposite side of its theoretical place (Figure 2).

CFA was conducted separately for all four higher-order values, and only for the self-enhancement was the RMSEA below a reasonable fit ($RMSEA = 0.093$), while the others showed either a reasonable or good fit (Table 2).

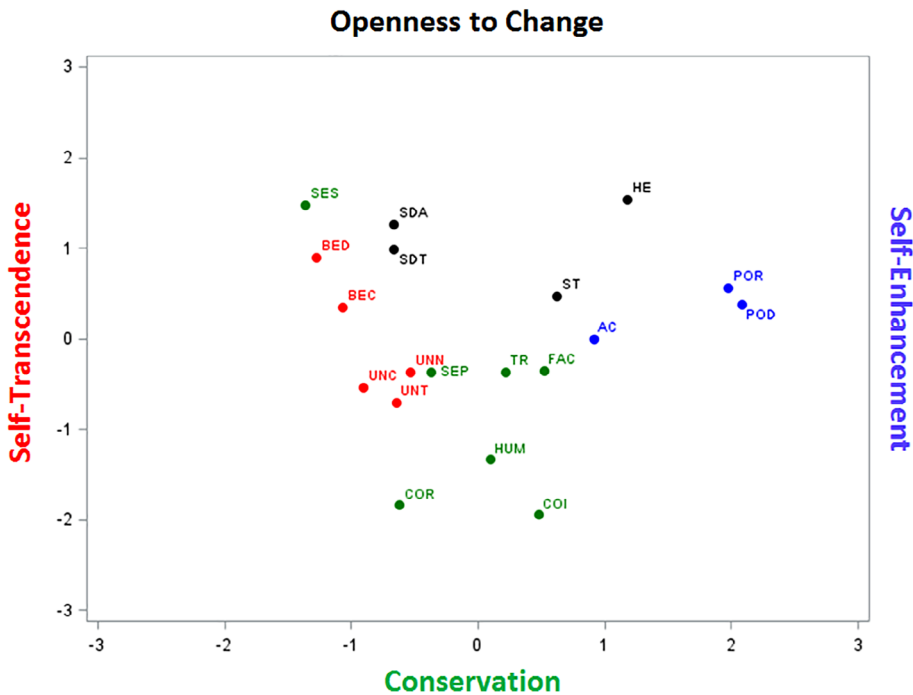


FIGURE 2 Multidimensional scaling (MDS) results of 19 values clustered in two dimensions. The different colours show in which higher-order values the individual values were placed. AC, achievement; BEC, benevolence-caring; BED, benevolence-dependability; COI, conformity-interpersonal; COR, conformity-rules; FAC, face; HE, hedonism; HUM, humility; POD, power-dominance; POR, power-resources; SDA, self-direction-action; SDT, self-direction-thought; SEP, security-personal; SES, security-societal; ST, stimulation; TRA, tradition; UNC, universalism-concern; UNN, universalism-nature; UNT, universalism-tolerance

TABLE 2 Goodness-of-fit indices from the CFAs of the four higher-order values including the values in each confirmatory factor analysis (CFA)

Models used in analysis	df	χ^2	CFI	SRMR	RMSEA (90% CI)
Openness to change (SDT, SDA, ST, HE)	48	1,061.75	0.932	0.0514	0.071 [0.068, 0.075]
Self-enhancement (AC, POD, POR)	24	884.27	0.938	0.0511	0.093 [0.088, 0.098]
Conservation (FAC, SEP, SES, TR, COR, COI, HUM)	168	2,431.44	0.925	0.0471	0.057 [0.055, 0.059]
Self-transcendence (UNN, UNC, UNT, BEC, BED)	80	1,201.58	0.952	0.0378	0.058 [0.055, 0.061]
Modified models					
Self-enhancement (with hedonism (HE))	48	1,625.20	0.918	0.0585	0.089 [0.085, 0.093]
Self-enhancement (with face (FAC))	48	1,563.48	0.918	0.0560	0.087 [0.091, 0.083]
Self-transcendence (with humility (HUM))	120	1,644.15	0.941	0.0380	0.055 [0.053, 0.058]

Note: Three modified models are also shown. Explanations for the abbreviations of the values are presented in Table 1. Abbreviations: AC, achievement; BEC, benevolence-caring; BED, benevolence-dependability; COI, conformity-interpersonal; COR, conformity-rules; FAC, face; HE, hedonism; HUM, humility; POD, power-dominance; POR, power-resources; SDA, self-direction-action; SDT, self-direction-thought; SEP, security-personal; SES, security-societal; ST, stimulation; TRA, tradition; UNC, universalism-concern; UNN, universalism-nature; UNT, universalism-tolerance.

Based on Schwartz's theory and the results of MDS, we also conducted CFAs to test the placements of the border values of hedonism, HUM and face. For self-transcendence, the addition of HUM did not significantly change the goodness of fit indices, validating its place in conservation. The addition of hedonism or face into self-enhancement

slightly weakened the CFI and SRMR indices, thus validating their place in openness to change and conservation, respectively.

4.2 | Finnish farmers' value priorities

Of the four higher-order values, self-transcendence scored highest ($\bar{x} = 4.63$), followed by conservation and openness to change ($\bar{x} = 4.18$ and 4.11 , respectively). Self-enhancement values scored significantly lower ($\bar{x} = 2.97$) than the three other values. With 10 values, benevolence was rated highest among Finnish farmers, followed by security and self-direction. Power was rated lowest. Of the 19 values, security-societal was clearly the most important value for Finnish farmers, followed by benevolence-caring, self-direction-action, benevolence-dependability and self-direction-thought (SDT) (Figure 3).

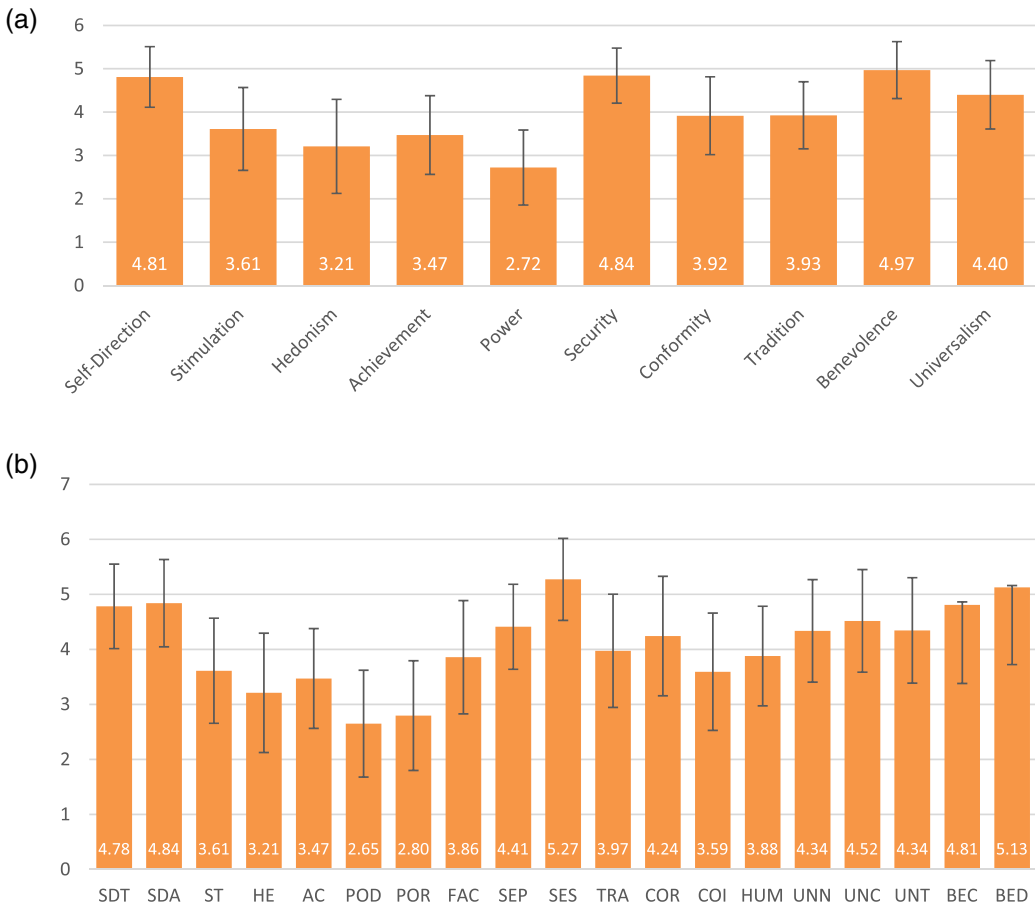


FIGURE 3 Farmers' mean values using the 10 (graph A) and 19 (graph B) value models. AC, achievement; BEC, benevolence-caring; BED, benevolence-dependability; COI, conformity-interpersonal; COR, conformity-rules; FAC, face; HE, hedonism; HUM, humility; POD, power-dominance; POR, power-resources; SDA, self-direction-action; SDT, self-direction-thought; SEP, security-personal; SES, security-societal; ST, stimulation; TRA, tradition; UNC, universalism-concern; UNN, universalism-nature; UNT, universalism-tolerance

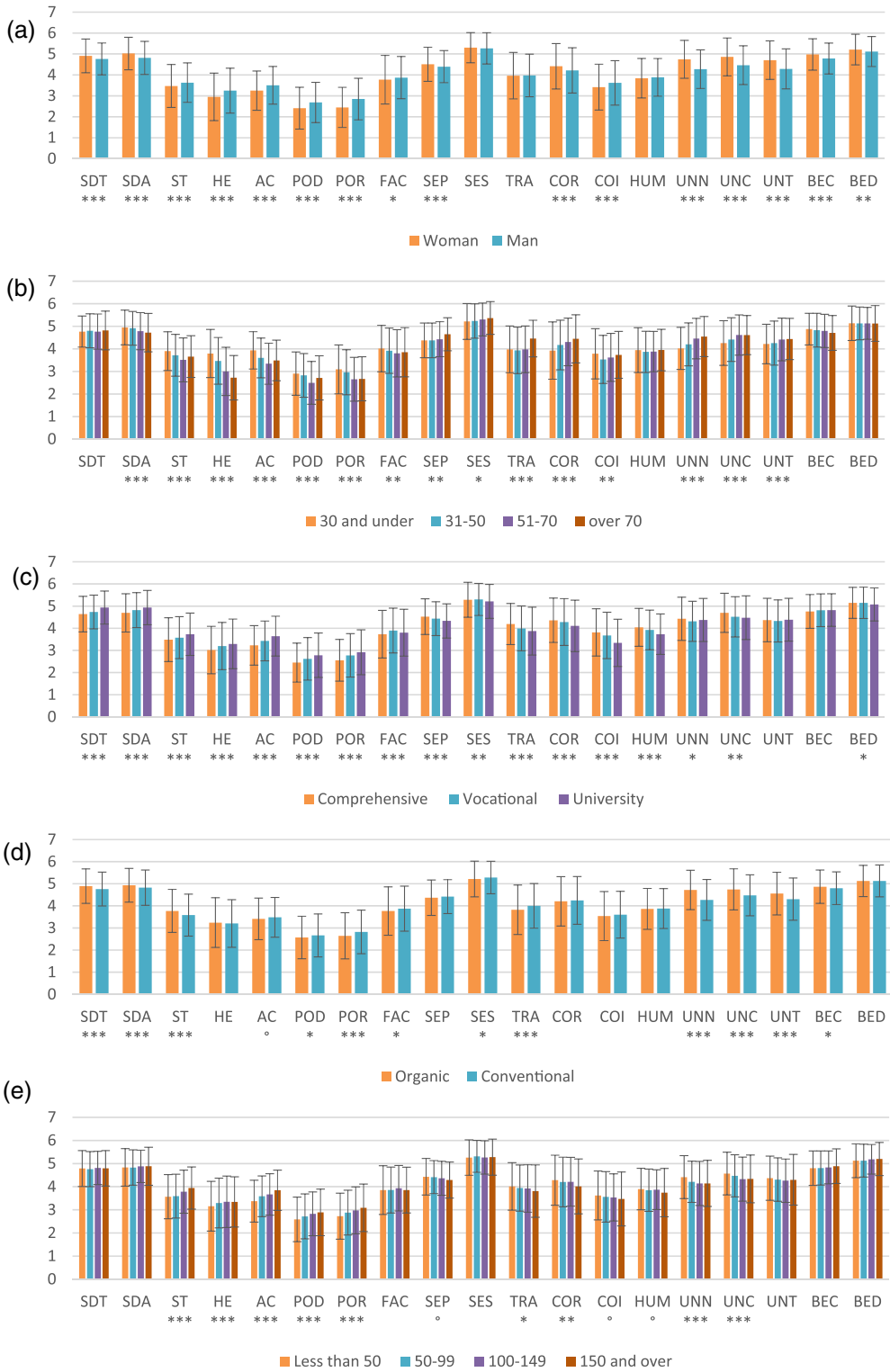


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4.3 | Association between demographics, farming choices and value priorities

Men and women differed in all other value motivations except tradition, security-societal and HUM (Figure 4, all ANOVA results are shown in Table A5 and the means, SDs for different groups in Table A6). The biggest gender differences were in self-transcendence values, especially universalism ($\Delta_{\text{UNC}} = 0.40, g = 0.43$; $\Delta_{\text{UNN}} = 0.47, g = 0.51$; $\Delta_{\text{UNT}} = 0.42, g = 0.44$), which women rated more highly than men. Self-enhancement values were all rated more highly by men than women ($\Delta_{\text{AC}} = 0.26, g = 0.28$; $\Delta_{\text{POD}} = 0.28, g = 0.28$; $\Delta_{\text{POR}} = 0.40, g = 0.40$), and of openness to change values, men rated hedonism ($\Delta_{\text{HE}} = 0.30, g = 0.28$) and stimulation ($\Delta_{\text{ST}} = 0.16, g = 0.17$) more highly, while women rated both self-direction values ($\Delta_{\text{SDT}} = 0.15, g = 0.19$; $\Delta_{\text{SDA}} = 0.21, g = 0.27$) more highly. All gender differences in conservation values were low ($g < 0.20$).

There was a strong age differentiation in values. Large- and medium-sized differences, measured by Hedges' g (g), were found with many values, especially hedonism. The biggest differences were between the youngest (≤ 30 years) and oldest (≥ 71 years) age groups ($\Delta_{1\text{vs}4} = 1.08, g = 1.05$), but the youngest and the 31–50 years' groups ($\Delta_{1\text{vs}2} = 0.33, g = 0.32$), the youngest and the 51–70 years' groups ($\Delta_{1\text{vs}3} = 0.80, g = 0.74$), the 31–50 years' group and the 51–70 years' group ($\Delta_{2\text{vs}3} = 0.47, g = 0.44$), and the 31–50 years' group vs the oldest age group differed markedly ($\Delta_{2\text{vs}4} = 0.75, g = 0.72$). Self-enhancement values of achievement, power-dominance and power-resources were more highly rated by younger farmers (Figure 4 and Appendices 5 and 6). Tradition values were more highly regarded by older farmers, and they differed from the two youngest groups ($\Delta_{2\text{vs}4} = 0.52, g = 0.51$; $\Delta_{1\text{vs}4} = 0.48, g = 0.51$). Universalism values, especially universalism-nature (UNN), were more highly rated by older groups ($\Delta_{1\text{vs}3} = 0.43, g = 0.48$; $\Delta_{1\text{vs}4} = 0.52, g = 0.57$).

Farmers' education level was also associated with their values. The greatest differences were between the groups with comprehensive and university education. University-educated farmers tended to place more emphasis on openness to change and self-enhancement than those with comprehensive education and less on conservation values (Figure 4 and Appendices 5 and 6). For example, achievement was much more motivating for university-educated farmers than those with comprehensive schooling ($\Delta = 0.42, g = 0.46$). At the same time, conformity-interpersonal was lower for university-educated farmers than those with vocational schooling ($\Delta = 0.47, g = 0.44$). As a trend, the more highly rated all openness to change and self-enhancement values were, the more educated the respondents were, and vice versa for conservation values. Self-transcendence values were not related to education level.

There was a statistical difference between organic and conventional farmers in 12 out of the 19 values. However, the difference was strong only in the self-transcendence values of universalism, which organic farmers rated more highly than conventional farmers (UNN $\Delta = 0.45, g = 0.49$; UNC $\Delta = 0.27, g = 0.29$ and UNT $\Delta = 0.25, g = 0.26$) (Figure 4 and Appendices 5 and 6). Openness-to-change values were also rated slightly more highly by organic farmers (ST $\Delta = 0.19, g = 0.20$; SDT $\Delta = 0.13, g = 0.17$ and SDA $\Delta = 0.11, g = 0.14$).

Revenue was associated with farmers' values, and medium to large effects measured by the Hedges' g were found between the opposing ends of the different groups. The differences became smaller or non-existent the closer the groups were to each other (Table A6). The highest differences overall were in self-enhancement values, where farmers with revenue of more than € one million rated achievement and power much more highly than farms with revenue of less than €20,000 (AC $\Delta_{1\text{vs}7} = 0.76, g = 0.81$; POD $\Delta_{1\text{vs}7} = 0.72, g = 0.73$ and POR $\Delta_{1\text{vs}7} = 0.52,$

FIGURE 4 Value differences for different genders (graph A), age groups (graph B), by level of education (graph C), by farming system (graph D) and by farm size (graph E, hectares). The statistically significant differences are indicated by *** $p < .001$, ** $p < .01$, * $p < .05$ or $^{\circ}p < .10$. AC, achievement; BEC, benevolence-caring; BED, benevolence-dependability; COI, conformity-interpersonal; COR, conformity-rules; FAC, face; HE, hedonism; HUM, humility; POD, power-dominance; POR, power-resources; SDA, self-direction-action; SDT, self-direction-thought; SEP, security-personal; SES, security-societal; ST, stimulation; TRA, tradition; UNC, universalism-concern; UNN, universalism-nature; UNT, universalism-tolerance

$g = 0.51$). The self-transcendence values of UNN and universalism-concern (UNC $\Delta_{1vs7} = 0.67$, $g = 0.74$; UNN $\Delta_{1vs7} = 0.47$, $g = 0.52$) and most conservation values were rated more highly by small revenue farms (HUM $\Delta_{1vs7} = 0.44$, $g = 0.47$; COR $\Delta_{1vs7} = 0.46$, $g = 0.40$; SEP $\Delta_{1vs7} = 0.29$, $g = 0.35$ and TRA $\Delta_{1vs7} = 0.35$, $g = 0.34$).

Differences were greatest between the smallest (<50 ha) and biggest (≥ 150 ha) farm groups. Self-enhancement values and especially achievement were more important the bigger the farm was (AC $\Delta_{1vs4} = 0.47$, $g = 0.52$; POR $\Delta_{1vs4} = 0.36$, $g = 0.36$ and POD $\Delta_{1vs4} = 0.30$, $g = 0.31$). Stimulation was also more important for bigger than smaller farms (ST $\Delta_{1vs4} = 0.37$, $g = 0.39$). UNN and UNC, on the other hand, were ranked most highly by the smallest farms (UNN $\Delta_{1vs4} = 0.27$, $g = 0.29$ and UNC $\Delta_{1vs4} = 0.23$, $g = 0.25$). For the smallest and biggest farms, the differences found in conformity ($\Delta_{1vs4} = 0.27$, $g = 0.25$) and tradition ($\Delta_{1vs4} = 0.20$, $g = 0.20$) values were also noteworthy. A trend in value differences according to farm size was that small farms placed more emphasis than any other farm on conservation (except for face and security-societal) and universalism values, while bigger farms placed more emphasis on self-enhancement values (Figure 4 and Appendices 5 and 6).

The region in which the farm was located was weakly associated with values. Most differences were negligible ($g < 0.20$) for the four major regions of Finland. Farmers in Southern Finland tended to highlight openness to change and self-enhancement more than their northern colleagues (HE $\Delta = 0.24$, $g = 0.23$; AC $\Delta = 0.17$, $g = 0.19$). Farmers in Eastern Finland tended to place a little more emphasis on universalism than farmers in Western Finland (UNN $\Delta = 0.14$, $g = 0.15$; UNC $\Delta = 0.19$, $g = 0.21$ and UNT $\Delta = 0.19$, $g = 0.20$). Farm type was even less important for value priorities than the region (Appendices 5 and 6).

The security-societal was the most important value for Finnish farmers and the one not following the logic of the basic human values theory. This value varied little with demographic variables or farming choices. This indicates its importance to all farmers, irrespective of their background. Face and benevolence-dependability were similarly rated across all farmers. The overall variance in basic human values explained by different demographic variables and farming choices varied depending on the value (Table A5). The reported variance in hedonism, for example, was explained by age but not so much by other demographic variables. Overall, age had the most explanatory power followed by revenue among the background variables studied. Looking at the values, variance in achievement was best explained by background variables, followed by UNN (Table A5).

5 | DISCUSSION

The Schwartz refined theory of 19 basic human values and the circular continuum of values were confirmed by this representative survey of Finnish farmers, with one notable exception to the theoretical model, security-societal value. The same value was also found to be the most important for Finnish farmers. Our results showed that farmers cannot be regarded as a single homogenous group in their motivational values as many differences between different farmer groups were found.

In our research, security-societal value, that is, safety and stability in the wider society, was separated from the security-personal value and placed between benevolence and self-direction values at the opposite side of the model than suggested by the theory. Similar to our results, in a study of Finnish values conducted in a workplace context, Koivula (2008) found that security values were placed against the original theory. Her research placed security adjacent to benevolence and universalism values. She explained this anomaly as a reflection of beliefs affecting the sense of Finland's national security as a relatively young nation that still feels vulnerable because of its history, powerful neighbours, international conflict or sense of social incoherence. Following this logic, the security values would be a means to preserve the universalism values that they were closely connected to in Koivula's research and thus part of national identity rather than personal values (Helkama, 2018; Maio, 2017). Schwartz et al. (2001) have also found that security values move on the motivational continuum suggesting that the value structure might be sensitive to powerful historical events. The research was done in the context of the apartheid past of South Africa. As the positioning of security has been random and contextual in different studies, no restructuring of the theory itself has been

proposed. Other anomalies to the original theory have been also noted, for example, equality (universalism value according to theory) was placed midst achievement values for Israeli women (Prince-Gibson & Schwartz, 1998).

However, previous value studies from Finland have not found this same anomaly with security-societal value (Pohjanheimo, 1997; Puohiniemi, 1995; Schwartz et al., 2012) as in the current study. Security values have a protective function (Schwartz et al., 2012), which have been argued to activate in the face of threat (Helkama, 2018). Our survey was sent out in early 2018. In August 2017, the first terrorist attack on Finnish soil was performed, and attacks were reported from other close-by regions. The Syrian war and the refugee crisis were reported constantly in the media (SUPO, 2020; IEP, 2018). The on-going Finnish presidential election debates highlighted foreign and security policy issues as the Finnish president acts as a leader of Finnish foreign policy and is the Supreme Commander of the Finnish Defence Forces. These co-occurring events might explain our results as security-related threats were actively discussed during the survey. It is noteworthy that values were surveyed simultaneously with climate change related threats, also discussed in the media more than before (Lyytimäki, 2020).

In contrast to Koivula (2008), our results positioned security-social between benevolence and self-direction values, not between universalism and benevolence values. If security-societal value is accepted as more of a component of national identity than a personal motivational goal, this might suggest a more closed-up definition for national identity, as benevolence values relate to the welfare and trustworthiness of one's in-group members. This might be logical also in the context where the survey was realised. Security-societal was also the most important value for Finnish farmers, followed by benevolence-caring and SDT values. Another explanation for the anomaly might be a technical one discussed by Koivula (2008), where the most important values position together as the relative importance of them is connected. This hypothesis is also supported by our results. As different research shows different findings that challenge the original theory, future research could strive for explanations through innovative empirical methods, such as analysis of conceptual similarity judgements of values (Coelho et al., 2019).

Previous research has established the importance of benevolence and security as the top guiding value principles for different groups in Finland (Karppinen & Korhonen, 2013; Koivula, 2008; Puohiniemi, 2006) and benevolence, self-direction and universalism internationally (Schwartz & Bardi, 2001). Our results are also consistent with the results of European Social Survey where Finland has been placed among the countries with high emphasis on self-transcendence and openness to change values (Tormos, Vauclair, & Dobewall, 2017). As most previous studies of farmers' values have stressed the importance of conservation values and especially tradition in motivating farmer behaviour (Baur et al., 2016; Dobricki, 2011; Gasson, 1973; Silvasti, 2003), it is noteworthy that a more detailed approach with 19 values showed that it was in fact security-societal, which raised the importance of conservation values. Without the security-societal, the mean for conservation values would drop (to 3.99 from 4.18), thus raising openness to change values above conservation values, and to second place after self-transcendence values. According to our results, it is time to stop thinking of farmers as inherently conservative and traditional as presented by previous research. Comparisons between the farmers and the non-farmers by the 19 values questionnaire could elaborate more, if there are differences between these two groups or have the previous notion of farmers as traditional been merely due to the shorter construct of the value questionnaire.

Women farmers emphasized the self-transcendence values of universalism, whereas men emphasized the self-enhancement values located on the opposite sides of the Schwartz value continuum. Our results mirror the gender differences found in previous research (e.g., Schwartz & Rubel, 2005). The UNN was especially a more important value for women than men. Value differences based on age were greatest between the youngest and oldest age groups, and the biggest difference was noted in hedonism. The values of tradition and universalism showed also notable differences and were more highly rated among the oldest age groups, a result consistent with previous research (Robinson, 2013). University-educated farmers rated the openness to change and self-enhancement values more highly than less-educated farmers, which is also consistent with previous results from non-farming groups (Verkasalo, Lönnqvist, Lipsanen, & Helkama, 2009). Values differed quite similarly with different farm size and revenue classes indicating that these variables measure the same thing, farms' economic wealth. Most differences in all the groups were found on the self-enhancement versus self-transcendence axis.

Differences in values were largely due to demographics (gender, age and education) and economic variables (revenue and farm size). Farmers' values were less connected with the farm type, that is, if they produced wheat or pork, or to the region where they lived. The farming system (organic or conventional) was relevant in explaining especially universalism values. There were also similarities: societal-security, face and benevolence-dependability were quite similarly rated across all the studied groups. It has to be noted that in our data, the organic farmers were more educated than conventional farmers, the two youngest age groups also had better income than the two oldest age groups and high education also raises income, so it is not possible to exactly pinpoint what is the primary reason for the value differences in different groups. The explanatory power of different variables varies a lot from value to value, and no single variable was found to explain all the values in a coherent way. This is well in line with the theoretical assumption of the motivational basis of the basic human values. Hedonism's strong connection to age connects to stages in peoples' lives when the individualistic needs of young age give way to responsibilities towards others in older age. It is also clear that other factors besides demographic or farming choices studied here have a significant role in shaping basic human values.

Previous farmers' value studies have rarely examined variations associated with demographics or farming choices. Many studies have also reached their conclusions with a relatively small sample and/or based on the four higher-order value outcomes. Given that several of these studies claim to be of use in planning agricultural or environmental policy, it is very doubtful that differences between farmer groups were not considered at all. The possibility of a more detailed value research with the renewed value theory of 19 values also proved its worth when comparing value priorities with demographic variables and farming choices. As universalism was divided into three components, UNC, nature and tolerance, we found much variation in the different components when comparing different demographic means. This will be helpful, for example, in targeted agri-environmental policy planning.

Although our survey was responded to by 4,401 Finnish farmers, the response rate was still quite low. This can be considered as a limitation of the research as respondents with certain values might be more eager to answer to surveys in general. The respondents were in many ways a representative sample of the Finnish farmer population, but they were slightly more educated and had higher revenue than the total farmer population. Younger age groups were slightly over-represented in our survey sample (Table A1). As we were interested in building bridges between values and future transformations of agriculture, this bias was deemed acceptable. A review of the background variable connections showed that there is some distortion in the compositions of different groups. For example, university-educated respondents were more often women than men (Table A7). The survey was cross-sectional, and therefore, causal associations between the values, farming styles and socio-demographical variables cannot be made. The value statements were placed last in a questionnaire dealing with manifold issues on farming practices, climate change and future of agriculture. These questions might have emphasized the perceived importance of certain values over others while responding to the value statements.

The number of farms is declining rapidly all over Europe. At the same time, the land area in agricultural use has remained stable, indicating larger farms (Eurostat, 2018). In Finland too, the number of farms has declined, and the scale of farming has increased at the same pace (Natural Resources Institute Finland, 2019). The results reveal that the most important values of Finnish farmers were benevolence, security and self-direction. Previously, farmers have been found to emphasize conservation values, whereas a more nuanced analysis showed that farmers distinguish between different types of conservation values and consider only security as very important. Moreover, giving high importance to the self-direction value suggests that farmers might have become more entrepreneurial than in the past. This may be a reflection of the structural change towards bigger farm units mentioned above because the management of larger farms can be compared to that of any other company. However, achievement and stimulation values, which often have been associated with entrepreneurship (Kennedy & Ho, 2020), were relatively low among farmers.

The average age of farmers is quite high in Finland, suggesting that a generational change is on the horizon. The younger generation of farmers is also likely to be more highly educated than their parents. The younger, highly educated farmers of the future with large farms producing high revenues are an indication of an even greater shift from conservation values towards values of openness to change. For a sector facing pressures to regenerate and adapt to new demands, this seems promising from the economic point of view.

The sustainability transition in agriculture is strongly linked to farmers' environmental concerns. Connections between values and environmental attitudes are well established and show association of self-transcendence values with concern for environmental issues (Hansla, Gamble, Juliusson, & Gärling, 2008; Schultz et al., 2005; Stern, 2000). According to our results, Finnish farmers are in general terms strongly inclined towards self-transcendence values and supporting universalism values, which are especially connected to pro-environmental concerns (Hansla et al., 2008). Despite the differences between farmer groups in universalism values, they are still highly endorsed in all groups. The connection between farmers' values, environmental concern and farming practices should be further studied to fully understand agriculture's transition pathways.

ACKNOWLEDGEMENTS

The work was financed by the European Commission Life-Programme and Natural Resources Institute Finland (Luke) as a part of a consortium project called Optimising Agricultural Land Use to Mitigate Climate Change (OPAL-Life, LIFE14 CCM/FI/000254; this paper only reflects the authors' view, and the EASME/Commission is not responsible for any use that may be made of the information it contains). The authors would also like to thank Lauri Jauhianen and Eino Uotila for primary data processing.

CONFLICT OF INTEREST

The authors have declared no conflict of interest.

AUTHOR CONTRIBUTIONS

Conceptualization: Jaana Sorvali; methodology: Jaana Sorvali, Markku Verkasalo and Annukka Vainio; formal analysis and investigation: Janne Kaseva and Jaana Sorvali; writing—original draft preparation: Jaana Sorvali; writing—review and editing: Jaana Sorvali, Markku Verkasalo, Annukka Vainio, Janne Kaseva and Pirjo Peltonen-Sainio; funding acquisition: Pirjo Peltonen-Sainio and Jaana Sorvali; resources: Jaana Sorvali; supervision: Pirjo Peltonen-Sainio.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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How to cite this article: Sorvali, J., Kaseva, J., Vainio, A., Verkasalo, M., & Peltonen-Sainio, P. (2022). Value priorities of the Finnish farmers—Time to stop thinking of farmers as inherently conservative and traditional. *Journal of Community & Applied Social Psychology*, 32(2), 212–240. <https://doi.org/10.1002/casp.2561>

APPENDIX A

TABLE A1 Basic characteristics of the respondents and the total Finnish farming population

	Finnish farmers, total		Survey sample	
	N	%	N	%
Number of farms	48,562		4,401	
Gender ^a				
Female	5,900	12	569	13
Male	43,820	88	3,831	87
Age				
30 and under	1,376	3	137	3
31–50	15,214	36	1,844	42
51–70	23,343	56	2,289	52
71 and over	1,945	5	129	3
Education ^b				
Comprehensive	8,741	18	325	7
Vocational	27,195	56	2,871	65
University	12,626	26	1,119	25
Other			84	2
Farming system				
Organic ^c	4,665	10	657	15
Conventional	43,897	90	3,743	85
Farm size (ha)				
less than 50	33,238	69	2,751	63
50–99	9,917	20	1,069	25
100–149	3,262	7	327	8
more than 150	2,145	4	191	4
Revenue (euros) ^d				
less than 20 000	23,592	50	886	20
20 000–50 000	9,359	20	1,111	25
50 000–100 000	5,939	13	914	21
100 000–300 000	6,385	13	1,032	23
300 000–500 000	1,101	2	280	6
500 000–1 000 000	676	1	176	4
more than 1 000 000	636	1	51	1
Farm type				
Family farm	41,878	86	3,707	84
Agricultural alliance	4,178	9	433	10
Limited liability company	931	2	84	2
Death estate	1,227	2	93	2
Other	348	1	82	2

(Continues)

TABLE A1 (Continued)

	Finnish farmers, total		Survey sample	
	N	%	N	%
Production line				
Cereals and other field crop	30,619	63	2,248	51
Dairy production	6,704	14	804	18
Beef production	3,485	7	287	7
Outdoor production	1,477	3	130	3
Pig production	607	1	165	4
Poultry production	436	1	65	1
Other	5,234	11	497	11
Not known	0	0	205	5
Region				
<i>Southern Finland</i>	14,809	31	1,471	35
Uusimaa	3,173	7	313	7
Southwest Finland	5,175	11	537	13
Southeast Finland	2,957	6	277	7
Häme	3,504	7	344	8
<i>Western Finland</i>	19,298	39	1,627	38
Satakunta	2,976	6	334	8
Pirkanmaa	3,782	8	405	10
Central Finland	2,576	5	238	6
South Ostrobothnia	5,411	11	364	9
Ostrobothnia	4,553	9	286	7
<i>Eastern Finland</i>	8,443	17	698	17
South Savo	2,339	5	193	5
North Savo	3,448	7	295	7
North Karelia	2,009	4	151	4
Kainuu	647	1	59	1
<i>Northern Finland</i>	5,609	12	399	9
North Ostrobothnia	4,273	9	314	7
Lapland	1,336	3	85	2
Åland (i.e. archipelago)	403	1	30	1

Note: Data for the total farming population in Finland is from 2017 because of the lack of comparable data from 2018. All data from Natural Resources Institute Finland 2019 unless otherwise stated.

^a(Eurostat, 2019).

^bNumbers for education are indicative due to limited data availability and differences in classification.

^c(Finnish Food Authority, 2019).

^dData for total of Finnish farmers from 2018.

TABLE A2 Values, items and corresponding statements

Value	Item	Statement
Self-direction-thought	SDT1	It is important to him/her to form his/her views independently
	SDT2	It is important to him/her to develop his/her own opinions
	SDT3	It is important to him/her to figure things out him/herself
Self-direction-action	SDA1	It is important to him/her to make his/her own decisions about his/her life
	SDA2	It is important to him/her to plan his/her activities independently
	SDA3	It is important to him/her to be free to choose by him/herself what he does
Stimulation	ST1	It is important to him/her always to look for different things to do
	ST2	It is important to him/her to take risks that make life exciting
	ST3	It is important to him/her to have all sorts of new experiences
Hedonism	HE1	It is important to him/her to have a good time
	HE2	It is important to him/her to enjoy life's pleasures
	HE3	It is important to him/her to take advantage of every opportunity to have fun
Achievement	AC1	It is important to him/her to have ambitions in life
	AC2	It is important to him/her to be very successful
	AC3	It is important to him/her that people recognize what he achieves
Power-dominance	POD1	It is important to him/her that people do whatever he says they should
	POD2	It is important to him/her to have the power to make people do what he wants
	POD3	It is important to him/her to be the one who tells others what to do
Power-resources	POR1	It is important to him/her to have the power that money can bring
	POR2	It is important to him/her to be wealthy
	POR3	It is important to him/her to own expensive things that show his/her wealth
Face	FAC1	It is important to him/her that no one should ever shame him/her
	FAC2	It is important to him/her to protect his/her public image
	FAC3	It is important to him/her never to be humiliated
Security-personal	SEP1	It is very important to him/her to avoid disease and protect his/her health
	SEP2	It is important to him/her to be personally safe and secure
	SEP3	It is important to him/her to avoid anything dangerous
Security-societal	SES1	It is important to him/her that his/her country is secure and stable
	SES2	It is important to him/her that the state is strong and can defend its citizens
	SES3	It is important to him/her that his/her country protect itself against all threats
Tradition	TR1	It is important to him/her to maintain traditional values and ways of thinking
	TR2	It is important to him/her to follow his/her family's customs or the customs of a religion
	TR3	It is important to him/her to honor the traditional practices of his/her culture
Conformity-rules	COR1	It is important to him/her never to violate rules or regulations
	COR2	It is important to him/her to follow rules even when no-one is watching
	COR3	It is important to him/her to obey all the laws
Conformity-interpersonal	COI1	It is important to him/her to avoid upsetting other people
	COI2	It is important to him/her never to annoy anyone
	COI3	It is important to him/her never to make other people angry
Humility	HUM1	It is important to him/her never to think he deserves more than other people
	HUM2	It is important to him/her to be humble
	HUM3	It is important to him/her to be satisfied with what he has and not ask for more

(Continues)

TABLE A2 (Continued)

Value	Item	Statement
Universalism-nature	UNN1	It is important to him/her to care for nature
	UNN2	It is important to him/her to take part in activities to defend nature
	UNN3	It is important to him/her to protect the natural environment from destruction or pollution
Universalism-concern	UNC1	It is important to him/her that the weak and vulnerable in society be protected
	UNC2	It is important to him/her that every person in the world have equal opportunities in life
	UNC3	It is important to him/her that everyone be treated justly, even people he doesn't know
Universalism-tolerance	UNT1	It is important to him/her to be tolerant toward all kinds of people and groups
	UNT2	It is important to him/her to listen to and understand people who are different from him/her
	UNT3	It is important to him/her to accept people even when he disagrees with them
Benevolence-care	BEC1	It is important to him/her to take care of people he is close to
	BEC2	It is very important to him/her to help the people dear to him/her
	BEC3	It is important to him/her to concern him/herself with every need of his/her dear ones
Benevolence-dependability	BED1	It is important to him/her that people he knows have full confidence in him/her
	BED2	It is important to him/her to be a dependable and trustworthy friend
	BED3	It is important to him/her that all his/her friends and family can rely on him/her completely

TABLE A3 Basic statistics of value items

Value	Item	Item mean	Item SE	Value mean	Value SE	Factor loading	Cronbach's α
Self-direction-thought	SDT1	4.55	0.02	4.78	0.02	0.568	0.675
	SDT2	4.93	0.01			0.778	
	SDT3	4.87	0.01			0.583	
Self-direction-action	SDA1	5.14	0.01	4.84	0.02	0.702	0.728
	SDA2	4.53	0.02			0.663	
	SDA3	4.85	0.02			0.699	
Stimulation	ST1	3.99	0.02	3.61	0.02	0.520	0.680
	ST2	3.06	0.02			0.606	
	ST3	3.79	0.02			0.797	
Hedonism	HE1	3.80	0.02	3.21	0.02	0.736	0.783
	HE2	3.61	0.02			0.843	
	HE3	2.22	0.02			0.644	
Achievement	AC1	4.39	0.02	3.47	0.02	0.459	0.626
	AC2	3.07	0.02			0.835	
	AC3	2.95	0.02			0.551	
Power-dominance	POD1	2.83	0.02	2.65	0.02	0.601	0.762
	POD2	2.24	0.02			0.830	
	POD3	2.88	0.02			0.724	

TABLE A3 (Continued)

Value	Item	Item mean	Item SE	Value mean	Value SE	Factor loading	Cronbach's α
Power-resources	POR1	3.27	0.02	2.80	0.02	0.736	0.770
	POR2	3.12	0.02			0.868	
	POR3	1.99	0.02			0.614	
Face	FAC1	4.03	0.02	3.86	0.02	0.761	0.767
	FAC2	3.98	0.02			0.702	
	FAC3	3.56	0.02			0.710	
Security-personal	SEP1	4.83	0.02	4.41	0.02	0.500	0.569
	SEP2	4.97	0.01			0.673	
	SEP3	3.43	0.02			0.513	
Security-societal	SES1	5.56	0.01	5.27	0.01	0.590	0.765
	SES2	5.12	0.01			0.805	
	SES3	5.14	0.02			0.792	
Tradition	TR1	4.43	0.02	3.97	0.02	0.704	0.778
	TR2	3.40	0.02			0.705	
	TR3	4.09	0.02			0.797	
Conformity-rules	COR1	4.11	0.02	4.24	0.02	0.821	0.860
	COR2	4.41	0.02			0.782	
	COR3	4.21	0.02			0.857	
Conformity-interpersonal	COI1	4.06	0.02	3.59	0.02	0.626	0.789
	COI2	3.34	0.02			0.812	
	COI3	3.38	0.02			0.809	
Humility	HUM1	4.12	0.02	3.88	0.02	0.377	0.523
	HUM2	3.77	0.02			0.621	
	HUM3	3.75	0.02			0.558	
Universalism-nature	UNN1	5.07	0.01	4.34	0.02	0.749	0.771
	UNN2	3.32	0.02			0.607	
	UNN3	4.62	0.02			0.839	
Universalism-concern	UNC1	4.85	0.02	4.52	0.02	0.635	0.745
	UNC2	3.96	0.02			0.710	
	UNC3	4.74	0.02			0.753	
Universalism-tolerance	UNT1	4.29	0.02	4.34	0.02	0.721	0.779
	UNT2	4.19	0.02			0.759	
	UNT3	4.55	0.02			0.725	
Benevolence-care	BEC1	5.30	0.01	4.81	0.01	0.731	0.696
	BEC2	5.08	0.01			0.769	
	BEC3	4.05	0.02			0.482	
Benevolence-dependability	BED1	4.87	0.02	5.13	0.01	0.635	0.748
	BED2	5.17	0.01			0.722	
	BED3	5.36	0.01			0.763	

TABLE A4 Correlations between values

	Self-direction-thought	Self-direction-action	Stimulation	Hedonism	Achievement	Power-dominance	Power-resources	Face	Security-personal	Security-societal
Self-direction-thought	1									
Self-direction-action	0.52	1								
Stimulation	0.07	0.11	1							
Hedonism	-0.10	0.02	0.37	1						
Achievement	-0.08	0.04	0.28	0.22	1					
Power-dominance	-0.07	-0.02	0.25	0.24	0.48	1				
Power-resources	-0.12	0.04	0.23	0.33	0.54	0.50	1			
Face	-0.18	-0.11	-0.20	-0.09	0.15	0.09	0.11	1		
Security-personal	-0.17	-0.13	-0.41	-0.20	-0.21	-0.22	-0.10	0.14	1	
Security-societal	0.13	0.12	-0.25	-0.23	-0.18	-0.21	-0.18	-0.05	0.11	1
Tradition	-0.15	-0.17	-0.23	-0.23	-0.07	0.01	-0.09	0.06	0.04	0.08
Conformity-rules	-0.18	-0.25	-0.36	-0.40	-0.24	-0.27	-0.28	0.00	0.20	0.03
Conformity-interpersonal	-0.36	-0.38	-0.33	-0.18	-0.25	-0.22	-0.16	0.20	0.25	-0.13
Humility	-0.14	-0.26	-0.22	-0.23	-0.37	-0.25	-0.37	-0.08	0.04	-0.09
Universalism-nature	0.02	-0.08	-0.08	-0.23	-0.33	-0.32	-0.37	-0.25	-0.01	0.00
Universalism-concern	0.00	-0.13	-0.20	-0.24	-0.47	-0.47	-0.50	-0.25	0.00	0.04
Universalism-tolerance	0.00	-0.11	-0.03	-0.15	-0.36	-0.41	-0.42	-0.36	-0.09	-0.09
Benevolence-care	0.10	0.06	-0.08	-0.11	-0.19	-0.24	-0.24	-0.19	0.00	0.15
Benevolence-dependability	0.09	0.08	-0.19	-0.20	-0.26	-0.32	-0.35	-0.18	0.08	0.27
Self-direction-thought		Conformity-interpersonal	Conformity-rules	Humility	Universalism-nature	Universalism-concern	Universalism-tolerance	Benevolence-care	Benevolence-dependability	
Self-direction-action		Conformity-rules	Conformity-interpersonal	Humility	Universalism-nature	Universalism-concern	Universalism-tolerance	Benevolence-care	Benevolence-dependability	
Stimulation		Conformity-rules	Conformity-interpersonal	Humility	Universalism-nature	Universalism-concern	Universalism-tolerance	Benevolence-care	Benevolence-dependability	
Hedonism		Conformity-rules	Conformity-interpersonal	Humility	Universalism-nature	Universalism-concern	Universalism-tolerance	Benevolence-care	Benevolence-dependability	

TABLE A5 Results of one-way ANOVA for values, F-values (F) and statistical significance (Δ)

	Gender	Age	Level of education	Farm system	Farm size	Revenue	Farm type	Region
SDT	F	$F_{3,4153}=0.83$	$F_{2,4078}=31.55$	$F_{1,4158}=15.44$	$F_{3,4097}=0.46$	$F_{6,4153}=1.40$	$F_{7,3434}=1.98$	$F_{3,3966}=0.71$
	Δ	***	***	***			o	
	R ²	0.4	1.5	0.4	0.0	0.2	0.4	0.1
SDA	F	$F_{3,4153}=33.67$	$F_{2,4078}=13.44$	$F_{1,4158}=10.09$	$F_{3,4097}=0.55$	$F_{6,4153}=1.42$	$F_{7,3434}=1.33$	$F_{3,3966}=3.16$
	Δ	***	***	***				*
	R ²	0.8	0.7	0.2	0.0	0.2	0.3	0.2
ST	F	$F_{3,4153}=13.46$	$F_{2,4078}=12.72$	$F_{1,4158}=21.14$	$F_{3,4097}=12.79$	$F_{6,4153}=7.35$	$F_{7,3434}=3.53$	$F_{3,3966}=3.52$
	Δ	***	***	***	***	***	***	*
	R ²	0.3	0.6	0.5	0.9	1.1	0.7	0.3
HE	F	$F_{3,4153}=36.13$	$F_{2,4078}=8.19$	$F_{1,4158}=0.69$	$F_{3,4097}=6.76$	$F_{6,4153}=7.95$	$F_{7,3434}=2.19$	$F_{3,3966}=5.18$
	Δ	***	***		***	***	*	**
	R ²	0.9	0.4	0.0	0.5	1.1	0.4	0.4
AC	F	$F_{3,4153}=38.24$	$F_{2,4078}=34.01$	$F_{1,4158}=3.00$	$F_{3,4097}=31.01$	$F_{6,4153}=21.68$	$F_{7,3434}=3.35$	$F_{3,3966}=8.94$
	Δ	***	***	o	***	***	**	***
	R ²	0.9	1.6	0.1	2.2	3.0	0.7	0.7
POD	F	$F_{3,4153}=38.62$	$F_{2,4078}=17.78$	$F_{1,4158}=4.88$	$F_{3,4097}=12.55$	$F_{6,4153}=11.76$	$F_{7,3434}=1.75$	$F_{3,3966}=5.99$
	Δ	***	***	*	***	***	o	***
	R ²	0.9	0.9	0.1	0.9	1.7	0.4	0.5
POR	F	$F_{3,4153}=77.56$	$F_{2,4078}=17.25$	$F_{1,4158}=16.70$	$F_{3,4097}=15.67$	$F_{6,4153}=11.21$	$F_{7,3434}=4.56$	$F_{3,3966}=4.31$
	Δ	***	***	***	***	***	***	**
	R ²	1.8	0.8	0.4	1.1	1.6	0.9	0.3
FAC	F	$F_{3,4153}=4.41$	$F_{2,4078}=5.80$	$F_{1,4158}=5.98$	$F_{3,4097}=0.58$	$F_{6,4153}=0.62$	$F_{7,3434}=1.70$	$F_{3,3966}=0.27$
	Δ	*	***	*				
	R ²	0.1	0.2	0.1	0.0	0.1	0.3	0.0
SEP	F	$F_{3,4153}=10.27$	$F_{2,4078}=10.12$	$F_{1,4158}=2.27$	$F_{3,4097}=2.47$	$F_{6,4153}=4.66$	$F_{7,3434}=1.51$	$F_{3,3966}=0.78$
	Δ	***	***		o	***		
	R ²	0.2	0.5	0.1	0.2	0.7	0.3	0.1
SES	F	$F_{3,4153}=0.92$	$F_{2,4078}=5.50$	$F_{1,4158}=4.44$	$F_{3,4097}=1.26$	$F_{6,4153}=1.85$	$F_{7,3434}=1.02$	$F_{3,3966}=1.34$
	Δ	*	**	*		o		
	R ²	0.0	0.3	0.1	0.1	0.3	0.2	0.1

TABLE A5 (Continued)

	Gender	Age	Level of education	Farm system	Farm size	Revenue	Farm type	Region
TRA	F F _{1,4158} =0.06	F _{3,4153} =9.69 ***	F _{2,4078} =12.68 ***	F _{1,4158} =15.99 ***	F _{3,4097} =3.37 *	F _{6,4153} =6.50 ***	F _{7,3434} =3.56 ***	F _{3,3966} =8.75 ***
	Δ							
	R ²	0.7	0.6	0.4	0.2	0.9	0.7	0.7
COR	F F _{1,4158} =15.95 ***	F _{3,4153} =10.09 ***	F _{2,4078} =11.93 ***	F _{1,4158} =0.86	F _{3,4097} =4.31 **	F _{6,4153} =5.54 ***	F _{7,3434} =0.87	F _{3,3966} =0.31
	Δ							
	R ²	0.4	0.6	0.0	0.3	0.8	0.2	0.0
COI	F F _{1,4158} =17.27 ***	F _{3,4153} =4.28 **	F _{2,4078} =45.59 ***	F _{1,4158} =1.95	F _{3,4097} =2.10 o	F _{6,4153} =3.88 ***	F _{7,3434} =2.51 *	F _{3,3966} =0.71
	Δ							
	R ²	0.4	2.2	0.0	0.2	0.6	0.5	0.1
HUM	F F _{1,4158} =1.01	F _{3,4153} =0.54	F _{2,4078} =22.60 ***	F _{1,4158} =0.19	F _{3,4097} =2.18 o	F _{6,4153} =4.08 ***	F _{7,3434} =2.05 *	F _{3,3966} =0.83
	Δ							
	R ²	0.0	1.1	0.0	0.2	0.6	0.4	0.1
UNN	F F _{1,4158} =124.23 ***	F _{3,4153} =32.21 ***	F _{2,4078} =3.08 *	F _{1,4158} =128.54 ***	F _{3,4097} =19.30 ***	F _{6,4153} =15.98 ***	F _{7,3434} =3.77 ***	F _{3,3966} =6.48 ***
	Δ							
	R ²	2.9	0.2	3.0	1.4	2.3	0.8	0.5
UNC	F F _{1,4158} =87.90 ***	F _{3,4153} =18.87 ***	F _{2,4078} =6.52 **	F _{1,4158} =45.20 ***	F _{3,4097} =10.25 ***	F _{6,4153} =11.36 ***	F _{7,3434} =2.97 **	F _{3,3966} =7.81 ***
	Δ							
	R ²	2.1	0.3	1.1	0.7	1.6	0.6	0.6
UNT	F F _{1,4158} =91.75 ***	F _{3,4153} =10.14 ***	F _{2,4078} =1.40	F _{1,4158} =36.04 ***	F _{3,4097} =1.89	F _{6,4153} =2.74 *	F _{7,3434} =1.87 o	F _{3,3966} =7.15 ***
	Δ							
	R ²	2.2	0.0	0.9	0.1	0.4	0.4	0.5
BEC	F F _{1,4158} =33.05 ***	F _{3,4153} =1.79	F _{2,4078} =0.84	F _{1,4158} =4.56 *	F _{3,4097} =0.96	F _{6,4153} =2.12 *	F _{7,3434} =1.13	F _{3,3966} =2
	Δ							
	R ²	0.8	0.0	0.1	0.1	0.3	0.2	0.2
BED	F F _{1,4158} =8.48 **	F _{3,4153} =0.00	F _{2,4078} =4.09 *	F _{1,4158} =0.01	F _{3,4097} =1.31	F _{6,4153} =1.38	F _{7,3434} =0.90	F _{3,3966} =0.61
	Δ							
	R ²	0.2	0.2	0.0	0.1	0.2	0.2	0.0

Note: The statistically significant differences indicated with *** p < .001, ** p < .01, * p < .05 or p < .10. No information means no statistical significance. R-squared value (R²) is marked as percent. Explanations for the abbreviations of the values are presented in Table 1.

TABLE A6 Mean value (μ), standard deviation (σ) and differences (Δ) between groups for 19 basic human values

	SDT		SDA		ST		HE		AC		POD		POR		FAC		SEP		SES		
	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	
Gender																					
Female	4.91	0.80	5.02	0.78	3.47	1.03	2.95	1.13	3.25	0.94	2.41	1.00	2.45	0.96	3.77	1.16	4.51	0.82	5.30	0.72	
Male	4.76	0.76	4.81	0.79	3.63	0.94	3.25	1.07	3.51	0.90	2.69	0.96	2.85	0.99	3.87	1.01	4.40	0.76	5.27	0.75	
Age																					
30 and under	4.77	0.69	4.95	0.77	3.90	0.86	3.80	1.06	3.93	0.83	2.90	0.96	3.09	1.08	4.02	1.03	4.38	0.77	5.22	0.79	
31–50	4.80	0.75	4.91	0.75	3.72	0.93	3.47	1.04	3.60	0.88	2.82	0.97	2.96	1.00	3.92	1.00	4.38	0.77	5.24	0.76	
51–70	4.77	0.78	4.78	0.82	3.51	0.97	3.00	1.07	3.34	0.91	2.50	0.95	2.65	0.97	3.80	1.05	4.43	0.77	5.30	0.73	
71 and over	4.82	0.86	4.72	0.85	3.66	0.93	2.72	0.98	3.49	0.90	2.71	0.98	2.67	0.98	3.85	1.09	4.65	0.73	5.37	0.73	
Education																					
Comprehensive	4.64	0.80	4.70	0.86	3.49	0.99	3.02	1.07	3.23	0.89	2.45	0.88	2.55	0.94	3.73	1.07	4.53	0.80	5.29	0.79	
Vocational	4.74	0.76	4.82	0.79	3.58	0.95	3.20	1.07	3.43	0.90	2.62	0.96	2.78	0.98	3.90	1.01	4.43	0.76	5.30	0.72	
University	4.93	0.75	4.93	0.77	3.73	0.96	3.29	1.12	3.64	0.90	2.78	1.00	2.91	1.01	3.80	1.06	4.33	0.77	5.21	0.77	
Farming system																					
Organic	4.89	0.78	4.93	0.76	3.77	0.97	3.24	1.12	3.41	0.94	2.57	0.96	2.65	1.04	3.77	1.09	4.37	0.80	5.22	0.81	
Conventional	4.76	0.76	4.82	0.80	3.58	0.95	3.20	1.08	3.48	0.90	2.66	0.97	2.82	0.99	3.87	1.02	4.42	0.77	5.28	0.73	
Farm size (ha)																					
Less than 50	4.79	0.78	4.83	0.81	3.57	0.95	3.16	1.08	3.37	0.91	2.59	0.96	2.72	0.99	3.85	1.05	4.43	0.79	5.26	0.76	
50–99	4.76	0.76	4.83	0.77	3.59	0.95	3.29	1.07	3.58	0.88	2.72	0.97	2.88	0.97	3.85	0.99	4.41	0.71	5.31	0.69	
100–149	4.81	0.72	4.88	0.70	3.78	0.93	3.35	1.11	3.66	0.90	2.83	0.95	2.98	1.01	3.93	0.98	4.36	0.73	5.27	0.72	
150 or more	4.79	0.77	4.88	0.82	3.94	0.91	3.34	1.09	3.85	0.87	2.89	1.01	3.09	1.03	3.85	0.99	4.29	0.78	5.28	0.78	
Revenue																					
Less than 20 000	4.78	0.80	4.84	0.83	3.55	0.99	3.05	1.10	3.28	0.94	2.54	0.98	2.64	1.00	3.83	1.11	4.44	0.81	5.24	0.80	
20–50 000	4.75	0.77	4.80	0.80	3.54	0.92	3.15	1.06	3.38	0.88	2.58	0.93	2.74	0.99	3.85	1.04	4.46	0.77	5.27	0.73	
50–100 000	4.80	0.76	4.86	0.77	3.60	0.94	3.27	1.05	3.52	0.88	2.68	0.96	2.86	0.95	3.90	1.00	4.41	0.76	5.30	0.71	
100–300 000	4.81	0.74	4.85	0.78	3.65	0.96	3.28	1.09	3.54	0.91	2.65	0.98	2.80	0.98	3.87	1.00	4.41	0.75	5.29	0.73	
300–500 000	4.81	0.72	4.84	0.74	3.73	0.94	3.27	1.10	3.72	0.83	2.87	0.95	2.97	1.01	3.80	0.91	4.30	0.74	5.31	0.67	

TABLE A6 (Continued)

	TRA		COR		COI		HUM		UNN		UNC		UNT		BEC		BED	
	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ
71 and over	4.46	0.81	4.45	1.07	3.73	1.04	3.95	0.92	4.54	0.89	4.61	0.87	4.44	0.91	4.71	0.77	5.13	0.79
Education																		
Comprehensive	4.19	0.93	4.36	1.00	3.81	1.07	4.04	0.86	4.43	0.97	4.70	0.88	4.37	0.98	4.76	0.76	5.15	0.70
Vocational	4.00	1.01	4.28	1.06	3.68	1.05	3.92	0.90	4.32	0.91	4.52	0.91	4.33	0.95	4.81	0.74	5.15	0.71
University	3.87	1.08	4.11	1.16	3.34	1.07	3.73	0.91	4.37	0.97	4.48	0.99	4.39	0.97	4.82	0.74	5.08	0.75
Farming system																		
Organic	3.82	1.12	4.21	1.12	3.54	1.11	3.86	0.93	4.72	0.89	4.75	0.93	4.56	0.96	4.87	0.75	5.13	0.71
Conventional	4.00	1.01	4.25	1.08	3.60	1.06	3.88	0.90	4.27	0.92	4.48	0.93	4.31	0.95	4.8	0.74	5.13	0.72
Farm size (ha)																		
Less than 50	4.01	1.03	4.28	1.08	3.62	1.06	3.90	0.90	4.41	0.93	4.57	0.92	4.37	0.96	4.80	0.75	5.12	0.73
50–99	3.94	1.00	4.20	1.07	3.56	1.09	3.85	0.92	4.21	0.89	4.47	0.91	4.31	0.94	4.81	0.74	5.13	0.71
100–149	3.92	1.02	4.21	1.06	3.54	1.02	3.87	0.86	4.14	0.95	4.33	0.95	4.26	0.94	4.83	0.71	5.19	0.64
150 or more	3.81	1.13	4.01	1.19	3.47	1.17	3.74	1.05	4.14	1.00	4.34	1.03	4.30	1.10	4.89	0.75	5.20	0.72
Revenue																		
Less than 20 000	4.08	1.01	4.30	1.12	3.62	1.10	3.94	0.93	4.55	0.91	4.70	0.87	4.45	0.94	4.82	0.76	5.12	0.71
20–50 000	4.04	1.01	4.28	1.06	3.67	1.03	3.91	0.88	4.38	0.92	4.55	0.92	4.34	0.94	4.80	0.74	5.12	0.72
50–100 000	3.98	0.99	4.27	1.05	3.58	1.06	3.86	0.88	4.31	0.89	4.46	0.90	4.29	0.94	4.77	0.73	5.13	0.71
100–300 000	3.91	1.07	4.23	1.09	3.59	1.07	3.89	0.90	4.26	0.97	4.46	0.95	4.34	0.97	4.87	0.72	5.18	0.71
300–500 000	3.80	1.01	4.18	1.08	3.46	1.03	3.79	0.96	4.12	0.84	4.42	0.98	4.28	1.01	4.74	0.76	5.08	0.69
500–1 000 000	3.66	1.05	3.78	1.09	3.26	1.06	3.64	0.90	3.94	0.99	4.23	1.00	4.23	0.98	4.79	0.74	5.05	0.80
More than 1 million	3.73	1.20	3.84	1.34	3.41	1.26	3.50	1.13	4.08	1.13	4.03	1.27	4.19	1.40	4.71	1.02	5.07	1.03
Farm type																		
Dairy	3.88	1.01	4.27	1.02	3.60	1.04	3.90	0.89	4.21	0.92	4.53	0.90	4.33	0.93	4.76	0.73	5.10	0.71
Beef	3.89	1.09	4.16	1.10	3.49	1.05	3.88	0.90	4.28	0.97	4.54	0.95	4.35	0.98	4.76	0.78	5.10	0.75
Pig	3.87	1.02	4.17	1.10	3.67	0.99	3.70	0.84	4.14	0.91	4.49	0.95	4.32	0.99	4.79	0.72	5.14	0.73
Poultry	3.90	1.00	4.11	1.02	3.48	1.19	3.77	0.95	4.14	1.04	4.48	0.94	4.36	0.94	4.83	0.75	5.28	0.61

TABLE A6 (Continued)

	TRA		COR		COI		HUM		UNN		UNC		UNT		BEC		BED		
	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	
Cereals	4.05	1.00	4.27	1.09	3.65	1.05	3.87	0.89	4.34	0.91	4.47	0.92	4.30	0.95	4.81	0.74	5.14	0.70	
Special crops	4.00	1.03	4.22	1.07	3.57	1.05	3.85	0.92	4.24	0.95	4.34	0.96	4.30	0.95	4.84	0.70	5.12	0.74	
Horticulture	3.77	1.00	4.22	1.11	3.43	1.05	3.94	0.88	4.54	0.90	4.69	0.91	4.57	0.92	4.89	0.65	5.12	0.74	
Greenhouse	4.27	0.79	4.58	0.72	4.39	1.04	4.45	0.95	4.55	0.62	4.85	0.77	4.79	0.91	5.12	0.40	5.36	0.35	
Region																			
Southern Finland	3.98	1.02	4.24	1.07	3.58	1.06	3.85	0.90	4.39	0.90	4.49	0.93	4.37	0.95	4.82	0.72	5.12	0.70	
Western Finland	4.06	1.00	4.24	1.08	3.63	1.06	3.88	0.91	4.25	0.97	4.46	0.93	4.26	0.97	4.82	0.74	5.15	0.72	
Eastern Finland	3.88	1.03	4.28	1.11	3.61	1.04	3.91	0.87	4.39	0.88	4.65	0.91	4.46	0.94	4.74	0.77	5.11	0.77	
Northern Finland	3.82	1.05	4.27	1.07	3.62	1.07	3.91	0.92	4.31	0.92	4.60	0.90	4.36	0.92	4.81	0.75	5.12	0.70	

Note: Means with the same letter do not differ significantly from each other (at significance level $\alpha = 0.05$). The absence of letters indicates non-significant differences. Dark green indicates high and light-yellow low values. Explanations for the abbreviations of the values are presented in Table 1.

TABLE A7 Percentage of respondents in each group of selected background variables

	Gender				Age				Education				Farming system				Revenue														
	Female		Male		30 and under		31-50		51-70		71 and over		Comprehensive		Vocational		University		Organic	Conventional		Less than 20 000	20 000 - 50 000	50 000 - 100 000	100 000 - 300 000	300 000 - 500 000	500 000 - 1 000 000	More than 1 million			
	100	0	100	0	3	46	49	2	5	56	40	20	80	27	25	19	20	6	3	0	27	19	11	16	25	35	9	2	1		
Female	100	0	100	0	3	46	49	2	5	56	40	20	80	27	25	19	20	6	3	0	27	19	11	16	25	35	9	2	1		
Male	0	100	0	100	3	41	53	3	8	68	24	14	86	19	25	21	24	7	3	1	19	25	11	23	21	27	9	2	2		
30 and under	100	0	100	0	0	0	0	0	2	52	43	23	77	11	16	25	35	9	2	2	11	16	23	28	21	27	9	5	2	2	
31-50	0	100	0	100	0	100	0	0	2	61	35	15	85	16	21	20	27	9	5	2	16	21	20	28	21	27	9	5	2	2	
51-70	0	0	100	0	0	0	100	0	11	70	17	15	85	23	28	21	21	4	2	1	23	28	21	28	21	21	4	2	1	1	
71 and over	0	0	0	100	0	0	0	100	20	50	29	12	88	36	43	8	10	3	0	1	36	43	8	10	3	0	0	0	1	1	
Comprehensive					100				100	0	0	12	88	26	32	23	16	3	1	1	26	32	23	16	3	1	1	1	1	1	
Vocational					0				0	100	0	14	86	18	25	20	25	7	3	1	18	25	20	25	7	3	1	1	1	1	
University					0				0	0	100	18	82	22	24	21	22	5	4	1	22	24	21	22	5	4	1	1	1	1	
Organic					100				100	0	0	100	0	21	24	23	24	5	3	1	21	24	23	24	5	3	1	1	1	1	
Conventional					0				0	100	0	0	100	20	25	20	24	7	3	1	20	25	20	24	7	3	1	1	1	1	
Less than 20 000					100				100	0	0	12	88	26	32	23	16	3	1	0	100	0	0	0	0	0	0	0	0	0	0
20-50 000					0				0	100	0	14	86	18	25	20	25	7	3	0	0	100	0	0	0	0	0	0	0	0	0
50-100 000					0				0	100	0	14	86	18	25	20	25	7	3	0	0	0	100	0	0	0	0	0	0	0	0
100-300 000					0				0	100	0	18	82	22	24	21	22	5	4	0	0	0	100	0	0	0	0	0	0	0	0
300-500 000					0				0	100	0	15	85	23	28	21	21	4	2	0	0	0	0	100	0	0	0	0	0	0	0
500-1 000 000					0				20	50	29	12	88	36	43	8	10	3	0	0	0	0	0	0	0	100	0	0	0	0	0
More than 1 million					0				0	100	0	12	88	26	32	23	16	3	1	0	0	0	0	0	0	0	0	0	0	100	100

Note: Universalism nature (UNN) value was used as the response variable, but the percentages are approximately the same for the other variables. The biggest differences between the groups are highlighted.