

Graskemper, Viktoria; Feil, Jan-Henning

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Values of farmers: Evidence from Germany

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Discussion Paper

Values of Farmers – Evidence from Germany

Viktoria Graskemper
Jan-Henning Feil

Department für Agrarökonomie und
Rurale Entwicklung
Universität Göttingen
D 37073 Göttingen
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VALUES OF FARMERS – EVIDENCE FROM GERMANY

Abstract

Against the background of fundamentally changing political and social requirements of agricultural production, the requirement profile of farmers has changed. The future of agriculture is widely discussed. To prepare a ground for future debates and policy programme design, it is essential to get an understanding of which values underlie farmers' behaviour. This paper applies SCHWARTZ' value theory to a large quantitative survey (N = 787) of German farmers. Next to the overall value portrait, different value portraits within the sample of farmers are analysed. Farmers of the sample first and foremost prioritise self-transcendence values followed by openness to change. Conservation and self-enhancement are ranked to be less important within farmers' value priorities. Furthermore, three different value portraits are identifiable within the sample. These groups differ significantly among other things in their risk attitude and involvement in structural diversification. Implications for agricultural policy design and agricultural management are derived from the results.

Keywords

farmer values, PVQ, agricultural values, entrepreneurship

1 Introduction

Combining business interests and life goals is a challenge farmers face in a particular way (Ilbery, 1978; Fairweather and Keating, 1994; Inhetveen and Schmitt, 2010). Farm management differs from purely commercial enterprises in that a traditional, family-run farm organisation often prevails, with farm management decisions having a direct influence on daily life both private and business (Ashby, 1953; Gasson and Errington, 1993). Furthermore, unlike in other sectors, dependence on natural conditions influences agricultural decisions resulting in considerable production risks (Inhetveen and Schmitt, 2010).

At present, changing consumer demands are a special challenge for farmers in Germany and throughout Europe. These lead to demands towards a higher social contribution to the long-term conservation of nature and its resources (Morris and Potter, 1995; Kuhnert, 1998; Rudmann, 2008; Grethe et al., 2018). This is reflected in a change of direction in agricultural policy towards a more extensive and multifunctional agriculture by making environmental services more binding or by tightening rules of animal husbandry as well as in a call for entrepreneurship in agriculture (Kirschke et al., 2007; DBV, 2018; Grethe et al., 2018; EC, 2019). Thus, the decision-making process of farmers nowadays is caught between multifaceted goals (Wiesinger, 2005; Grethe et al., 2018).

The identification with the changed requirement profile and the decision between the numerous entrepreneurial choices farmers make are determined by the underlying individual value orientation (Gasson, 1973; Ilbery, 1983). Numerous studies assume that this new profile is only partially compatible with the traditionally based agricultural attitude (Pongratz, 1991; Pyysiäinen et al., 2006; Vesala and Vesala, 2010). In context of a vivid policy debate about the future of agriculture, as reflected for example in the European Green Deal with its Farm to Fork Strategy (EC, 2019), it is essential to know which value portrait underlies the behaviour

of farmers. This is the basis to be able to identify their motivational drivers as these are related to entrepreneurial activity (Carsrud and Brännback, 2011; Fayolle et al., 2014), the strategic orientation of the business (Kotey and Meredith, 1997) and its success (Zhao et al., 2010; Leutner et al., 2014). It is also helpful for farmers themselves to be aware of this and to act consciously accordingly. Within debates about the future of agricultural policy it is important to discuss and set targets according to the underlying motivational drivers of the different actors instead of being limited to a purely operational level.

Existing studies dealing with farmers' values are mostly based on rather small samples and do not investigate differences among the value portraits of farmers. Furthermore, many of them do not differentiate among the different terms of values, goals and motives and their specific impacts (Dobricki, 2011). Often initiated by the pilot study by Gasson (1973) investigating English farmers' goals and values, there are a number of studies dealing with these aspects from various perspectives with samples from different countries across the world (e. g. Kerridge, 1978; Harper and Eastman, 1980; Fairweather and Keating, 1994; Parminter and Perkins, 1997; Willock et al., 1999; Frost, 2000; Bergevoet et al., 2004; Maybery et al., 2005; Teixeira and Vale, 2008; Niska et al., 2012; Duesberg et al., 2013). Regarding Germany, Baur et al. (2016) include a rather old subsample (N = 224) of German farmers (average age of 60 years) within their analysis of the value portrait of Swiss farmers. Diekmann and Theuvsen (2019) analyse the value portrait of members of community supported agriculture (CSA), meaning a sample of consumers not farmers, in Germany. Apart from these, to the best of the authors' knowledge, there is no study investigating exclusively and in depth the basic values of German farmers on the basis of a large sample and a standardised value theory.

The present study contributes to filling this research gap by investigating the value portrait of German farmers on the basis of a large-scale, quantitative farmer survey (N = 787) including not only questions about the value portraits but also socio-demographic and farm characteristics. For this purpose, the internationally recognised Portrait Value Questionnaire (PVQ) by Schwartz (2003) was used. After analysing the value portrait of German farmers with the help of multidimensional scaling (MDS), a cluster analysis is performed by means of an unsupervised machine learning approach identifying different value portraits among the farmers. Furthermore, differences between personal and farm characteristics between those clusters of different value preferences are analysed.

After giving a background on values in the context of farming, SCHWARTZ's theory on basic human values is introduced. This is followed by a section on the methodology and data. The results are presented and discussed in Section 5. Finally, a conclusion is drawn in Section 6.

2 Values in the context of farming

The decision-making behaviour of farmers is something that rational economic theories are incapable of accurately explaining, as the structures of enterprises are very interwoven (Gasson, 1973) and non-pecuniary benefits make some choices more attractive even though others may be financially more rewarding (Howley, 2015). This is where goals and values come into play. In general, personal values are ascribed a catalyst role for entrepreneurship (Hemingway, 2005). In the following, the concept of values is introduced in demarcation to goals. Afterwards, an overview is given on value research in agriculture.

The heterogeneity found in farm development pathways is also evident in terms of value concepts, which can vary according to perspective and background (Bilsky, 2015). Values are closely linked to motivational goals and guide individual decision-making behaviour (Bardi and Schwartz, 2003). In this context, goals are defined as states or aspirations that a person wishes to achieve, whereby the goals can be either individual goals or intermediate goals in order to pursue the next higher goal. Depending on family circumstances, personal developments or professional influences, goals can change in the course of a life-time (Gasson, 1973; Kerridge, 1978). Values, on the other hand, are defined as fixed notions of desirable states based on deeply rooted and abstract motivations, which are the permanent property of each individual (Gasson, 1973; Schwartz, 2003). The value concepts to be aspired to are relatively independent of the situation and time when going through different phases of life and are justified by reason and moral principles. Values normally cannot be fully satisfied in contrast to concrete goals (Kerridge, 1978; Gasson and Errington, 1993; Kluckhohn, 2013). Determinants of farmers' value orientation are, according to Kerridge (1978), social and economic conditions in which farmers live and grow up in, such as farm size or age. Olver and Moordian (2003) find values being influenced by personality traits and the environment.

Reviewing the existing literature, Ashby (1926) previously analysed farmers motivation drivers beyond pure profit maximisation. Another pioneering study investigating the motivation of farmers in relation to their behaviour conducted by Gasson (1973) puts a focus on English farmers' personal value system and their goals as determinants, taking into account farming families as well. Overall, this study identified four groups of farmers' values: instrumental, social, expressive and intrinsic values. In relation to agricultural activity, Gasson (1973) finds intrinsic values are of utmost importance for the sample of English farmers, thus, showing a strong intrinsic orientation to work. Social values, which include prestige or affiliation, are of least importance (Gasson, 1973). Depending on study region, sample and study period, other researchers find slightly different priorities among these value groups, yet, social values remain to be the least important ones (e. g. Kerridge, 1978; Frost, 2000). Furthermore, Gasson and Errington (1993) identified that important agricultural values are also family values, honesty, and entrepreneurial success and progress.

Several studies agree on the point that the value profile of farmers differs from the general population. Dobricki (2011) and Baur et al. (2016) analysed the PVQ by Schwartz (2003) using data of the European Social Survey (ESS) and found that farmers are less motivated by economic performance and are less open to change than the general population. At the same time they show a strong interest in preserving conservation values, including tradition, conformity and security. They found this value profile particularly pronounced for Austrian, Finnish and German farmers (Baur et al., 2016). Apart from these conservational values, they identified self-transcendence more pronounced than self-enhancement (Dobricki, 2011; Baur et al., 2016). Diekmann and Theuvsen (2019) identified for CSA members a high importance of self-transcendence and openness to change values. Conservational and self-enhancement values appear to be of less importance for this sample. Besides this, they analyse a sample of the German population of the ESS (from 2014) and find self-transcendence values of major and self-enhancement of minor importance, conservation and openness to change of rather equal importance.

Some studies use the farmers' value priorities to draw conclusions for the acceptance and implementation of agri-environmental programmes. Such programmes should be designed in a way that highlights the added value for society and the environment in the long-run and be less based on monetary incentives (Morris and Potter, 1995; Frey, 1997; Grüner and Fietz, 2013; Baur et al., 2016). Excessive regulation and sanctions can lead to farmers no longer carrying out voluntary actions out of their own intrinsic motivation because they are no longer self-determined and do not feel valued enough (Frey, 1997). Building on the work of Gasson (1973), Duesberg et al. (2013) find that the participation in afforestation schemes in Ireland is related to the farmers' intrinsic, instrumental, social and expressive farming values which sometimes contradict themselves. Most farmers are guided by their intrinsic values in relation to farm afforestation, a much smaller group by profit maximisation. Gravsholt Busck (2002) furthermore investigates the relationship between the values of farmers and their landscape practice in Denmark coming to the result that those practices can be conceptualised on the basis of different value profiles. Moreover, Hansson and Sok (2021) use the values self-transcendence and conservation as described by Schwartz as covariates for explaining the latent variable of perceived obstacles for business development of Swedish farmers but did not find an effect.

Moreover, Inhetveen and Schmitt (2010) describe that independence and self-determination are of utmost importance for German farmers. Niska et al. (2012) find similar results for the autonomy of Finnish farmers. In Niska et al.'s (2012) study, autonomy values are followed by economy, societal and inter-generational continuity. Confirming the results regarding the importance of continuity of the farm, Schoon and Grotenhuis (2000) find furthermore, societal appreciation, and perceptions of nature as topics of great concern for a sample of Dutch farmers where the relation between convictions, values and behavior is qualitatively investigated.

Results from Parminter and Perkins (1997) on farmers from New Zealand show that they identify primarily with values in pursuit of entrepreneurial goals and interpret the achievement of these values as their personal success, which distinguishes them from the general population. In addition, a group of farmers in the study also prioritise values related to the well-being of others and the protection of natural resources.

3 SCHWARTZ'S theory on basic human values

Within the social sciences, there are various studies and models about human principles (Rokeach, 1973; Inglehart, 1977; Hofstede, 1980; Schwartz and Bilsky, 1987, 1990). Schwartz's *Theory of Basic Human Values* from 1992 makes the claim that the various perspectives of value research can be combined into one. It is highly recognised in international academic literature as it can be applied universally and cross-culturally, independent of the respondent's intellect.

The value theory is based on three basic assumptions. The first assumption assumes that the ten basic values of the theory can be described by five formal characteristics: values are concepts or rather ideas which address desirable final stages or behavioural patterns; values can endure concrete situations, negotiations and norms; they allow a choice or assessment of behaviour patterns or incidents; and they are arranged hierarchically (Schwartz and Bilsky,

1987, 1990). Each value type, as described in Table 1, is worded to reflect on existential and basic human needs (Schwartz, 1992; Bardi and Schwartz, 2003). The descriptions of the ten value types are to be understood as the synthesis of the individual motivational aims which are the result of a person's individual values.

Self-transcendence	Universalism Understanding, appreciation, tolerance and protection for the welfare of all people and for nature <i>(broadminded, wisdom, social justice, equality, a world at peace, a world of beauty, unity with nature, protecting the environment)</i>
	Benevolence Preservation and enhancement of the welfare of people with whom one is in frequent personal contact <i>(helpful, honest, forgiving, loyal, responsible)</i>
Conservation	Tradition Respect, commitment and acceptance of the customs and ideas that traditional culture or religion provide the self <i>(humble, accepting my portion in life, devout, respect for tradition, moderate)</i>
	Conformity Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms <i>(politeness, obedient, self-discipline, honouring parents and elders)</i>
	Security Safety, harmony and stability of society, of relationships, and of self <i>(family security, national security, social order, clean, reciprocation of favours)</i>
Self-enhancement	Power Social status and prestige, control or dominance over people and resources <i>(social power, authority, wealth, preserving my public image)</i>
	Achievement Personal success through demonstrating competence according to social standards <i>(successful, capable, ambitious, influential)</i>
Openness to change	Hedonism Pleasure and sensuous gratification for oneself <i>(pleasure, enjoying life, self-indulgence)</i>
	Stimulation Excitement, novelty, and challenge in life <i>(daring, a varied life, an exciting life)</i>
	Self-direction Independent thought and action-choosing, creating, exploring <i>(creativity, freedom, independent, curious, choosing own goals)</i>

Table 1: Definitions of motivational types of values in terms of their goals, single values and higher-order values. Source: adjusted from SCHWARTZ (2009)

The second assumption is that the value types in the value system are subject to mutual relationships in which, depending on the value type, either content-related conflicts of objectives or harmonious relationships predominate (Schwartz and Sagiv, 1995). Graphically, these interrelationships become clear through the specific arrangement in a circular structure (Bilsky et al., 2011), as illustrated in Figure 1.

The third theoretical assumption is that the ten competing or harmonising value types can be summarised more generally into four higher order values. The four higher-order values are each grouped into two opposing pairs of value types, which in turn are opposite of each other in a circle (Schwartz, 1992; Schwartz and Sagiv, 1995; Schwartz, 2003, 2012). Hedonism is the only value type that shares elements of self-enhancement and openness to change. In the literature, this type is predominantly associated with openness to change (Schwartz, 1992, 2003, 2012) as is also the case in this study.

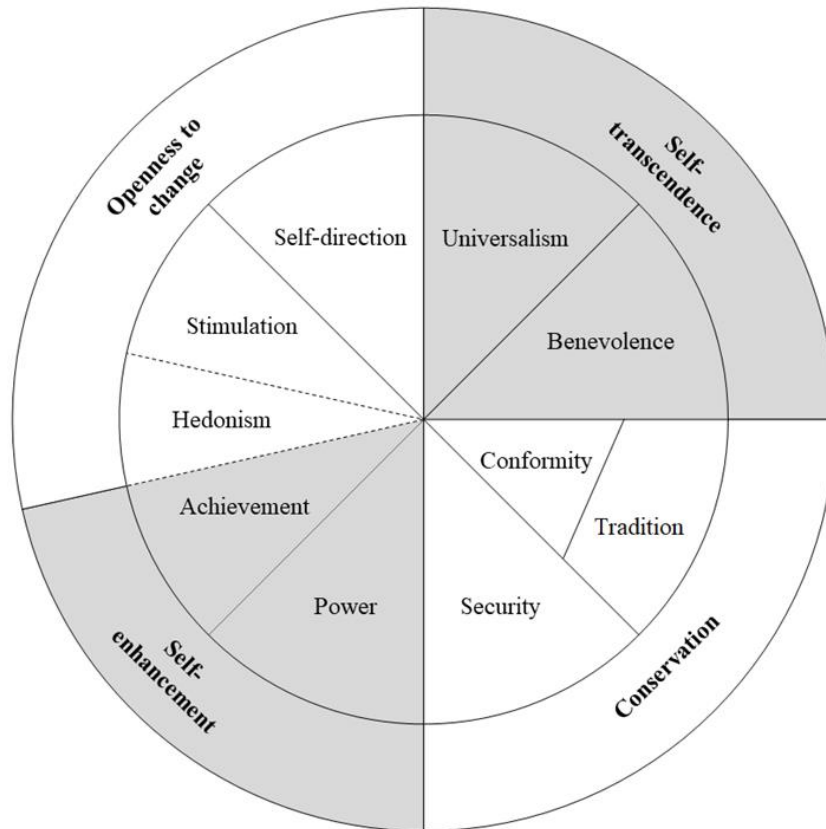


Figure 1: Value arrangement
 Source: adjusted from Schwartz (1992) and Bilsky et al. (2011)

4 Data and methodology

Within the following section, the sample and the data collection process are described first. Afterwards, the statistical analysis of the values using the PVQ and MDS is described. Finally, the applied clustering approach is presented.

4.1 Sample

The PVQ was included in a quantitative online survey on entrepreneurship in agriculture among German farmers. As the study subject is a forward-looking topic, farm successors who already work on the farm and who are significantly involved in management and development of the operation are included in the sample as well. Next to the PVQ, the survey included questions concerning the farmer, the farm and the context. The data collection took place from November 2018 until February 2019. The survey link and the barcode were distributed through various channels; promotion on the homepages, social media channels, newsletters and e-mail distribution lists of different agricultural institutions, such as (young) farmers' associations and rural education centres, publications within articles of regional and national agricultural magazines, direct acquisition of farmers during an agricultural fair, and distribution of flyers at various farmer events. This led to 926 completed questionnaires. From these, in total 62 were led automatically to the end of the survey as they did not fit the target group, 62 questionnaires were excluded because of big outliers or inconsistencies within the responses, and another 15 were deleted due to missing or repeated answers within the PVQ. This resulted in a sample size of 787. Descriptive statistics are to be found in Table 2.

Variable	Definition	Scale / measurement	Mean	SD	Min	Max
<i>Farmer</i>						
Age	Age	number of years	38.38	12.89	19	74
Male	Gender	1 = male; 0 = female	0.85	0.36	0	1
Degree	Third-level education; degree from a university or university of applied sciences	1 = yes; 0 = no	0.42	0.49	0	1
Edu_agr	Agricultural education	1 = yes; 0 = no	0.88	0.32	0	1
Partnership	Living in a partnership	1 = yes; 0 = no	0.75	0.43	0	1
Job	Off-farm job of the farmer	1 = yes; 0 = no	0.30	0.46	0	1
Childhood	Relation to farming during childhood	1 = grown up on a farm; 2 = farm in the family; 3 = working on neighbour farm; 4 = no relation to agriculture	1.24	0.66	1	4
Risk	Risk attitude according to Dohmen et al. (2011)	0 = not at all willing to take risks; 10 = very willing to take risks	6.00	1.91	0	10
<i>Farm</i>						
Position	Farmer of the operation	1 = farmer; 0 = successor	0.66	0.47	0	1
Familyfarm	Family farm	1 = yes; 0 = no	0.88	0.33	0	1
Size	Farm size, total area under cultivation	number of hectares	312.71	634.14	1	6200
Size_initial	Initial farm size, total area under cultivation	number of hectares	249.94	583.60	1	6200
Fulltime	Farming business in full-time	1 = yes; 0 = no	0.87	0.34	0	1
Organic	Organic farming	1 = yes; 0 = no	0.11	0.32	0	1
Foc_arable	Focus on arable farming	1 = yes; 0 = no	0.69	0.46	0	1
Foc_fordairy	Focus on forage crops and dairy cattle	1 = yes; 0 = no	0.31	0.46	0	1
Foc_foroth	Focus on other forage crops	1 = yes; 0 = no	0.17	0.37	0	1
Foc_refine	Focus on refinement; pigs or poultry	1 = yes; 0 = no	0.31	0.46	0	1
Foc_horti	Focus on horticulture	1 = yes; 0 = no	0.02	0.15	0	1
Foc_perma	Focus on permanent crops	1 = yes; 0 = no	0.06	0.24	0	1
Div_agr	Agricultural diversification	1 = yes; 0 = no	0.45	0.50	0	1
Div_str	Structural diversification	1 = yes; 0 = no	0.45	0.50	0	1
Renew_en	Renewable energy (biogas, wind, solar)	1 = yes; 0 = no	0.56	0.50	0	1
Soil	Average soil quality on the agricultural main site according to the German system of "Ackerzahl"	points 1-100	47.15	17.95	10	100
Rain	Average rainfall on the agricultural main site in mm / year	number mm / year	700.75	179.85	250	1500
West	Location of agricultural sites in the old German states	1 = yes; 0 = no	0.86	0.35	0	1
Central	Location of the agricultural main site near a metropolitan area or tourist / recreation region	1 = yes; 0 = no	0.11	0.31	0	1
Wf_family	Number of family workers in the business	number of family workers	1.87	1.10	0	6
Wf_spouse	Spouse works / assists on the farm / in the business	1 = yes; 0 = no	0.35	0.48	0	1
Coop	Cooperation with other farmers	1 = yes; 0 = no	0.78	0.42	0	1

Table 2: Descriptive statistics of the variables

The mean age is 38 years and considerably younger than the German average where 34 % of all German farmers are above the age of 55 (DBV, 2018). This can be explained by the inclusion of the young generation of farmers. This inclusion facilitates a full picture of the values

of all active farmers as there is often a transition period between two generations of farmers working together but not being registered separately. From this perspective, only a rough comparison can be made between the census data and the sample at hand to put some main numbers into perspective. Of the surveyed sample, 85 % of the participants are male. This is in line with the census which states 90 % of farms are managed by men (DBV, 2018). Regarding education, 42 % hold a third-level degree which is higher than 12 % within the official data (DBV, 2018) and 89 % received agricultural vocational training. This higher share may be caused by a more open-mindedness for supporting research by farmers who received a third-level education. As farming is mainly a family business in Germany, most farmers grew up on a farm.

Regarding farm characteristics, the average amount of land of 312 ha is higher compared to 62 ha within official data from 2017 (DBV, 2018) and might be explained by a high share of full-time farms (87 %) and the comparably high share of farms with a location in the new federal states where historically larger farm structures dominate. The fact that most farmers indicate a focus on arable farming might be explained by the fact that some farmers may have stated this in combination with animal husbandry. The pursued diversification activities of the farmers are categorised in agricultural and structural diversification according to the definition of Ilbery (1991), adjusted to the present situation. Agricultural diversification comprises the keeping of unconventional animal breeds, the cultivation of unconventional crops, and all activities in the area of forestry as well as agricultural contraction / wage services. Structural diversification consists of overnight accommodation, leisure activities, alternative marketing and distribution channels, processing of agricultural products, solidary / social / educational activities, and the leasing of land and buildings. According to Weltin et al. (2017), these are mainly on-farm diversification activities whereas off-farm activities are represented by the farmer's off-farm job. Compared to the census data where one-third of German farmers is engaged in diversification activities, including renewable energy production (DBV, 2018), the share of 45 % stating to pursue agricultural diversification and another 45 % towards structural diversification is rather high and equally distributed. That renewable energy production is listed separately and shows a high involvement (56 %) is to be traced back to a massive political push in Germany towards an investment in this area (UBA, 2019). On average 1,87 family members and 35 % of the spouses work within the business. Cooperation with other farmers (78 %) is common within the sample.

4.2 Statistical analysis of the values

The Schwartz (2003) 21-Item PVQ applied in this study is means to measure the ten theoretical value types which can be well integrated into a survey due to its brevity (Schmidt et al., 2007). It consists of 21 items which present short, easily understandable, verbal portraits of 21 persons, as attached in the Appendix. These portraits express objectives, attitudes or wishes that can be explicitly assigned to one of the ten value types. The respondents are asked to compare the statements with themselves on a 6-level likert scale (1 = *not like me at all*; 6 = *very much like me*). This form of questioning focuses on the content of the portraits without directly addressing the value types. Consequently, a truthful answer can be assumed. Farmers'

inner attitudes and value systems come to light and the risk of socially desirable answers is lower (Schmidt et al., 2007).

With the help of a non-metric or ordinal MDS, the value model with interrelationships is visualised by transferring coordinates of the ten basic values into a two-dimensional diagram. Similarities or dissimilarities among the values are illustrated by their distances between the value points resulting from the intercorrelations (Borg and Staufenbiel, 2007). In preparation for the MDS, the variables must be adjusted and summarised (Schwartz, 2005a). As there are different formulations for both women and men, the different data was merged first into the 21 items. Data sets containing at least five missing items and 15 or more identical answers were deleted. Subjects who did not distinguish between the 21 items were excluded. An index was created for the ten unprocessed raw basic values by calculating mean values from the answers of the specific items for each value type. The summary of the four higher order values is done in the same way as the index formation. The reliability of the raw indices was tested by a reliability analysis using Cronbachs α (Schwartz, 2003). To be able to consider the relative importance of the individual value types within the value system, in a final preparatory step, the various individual scale uses in answering are ipsatised by calculating the average score for each participant from the given answers and subtracting it from the absolute score (Schwartz, 2003; Fischer, 2004; Schwartz, 2005b; Fischer and Milfont, 2010).

For the subsequent confirmatory structural analyses, a symmetrical 10 x 10 matrix from the Pearson correlation coefficients of the ten value types was created. Furthermore, a theoretical starting configuration, a design matrix, to which the determined correlation coefficients of the farm managers are aligned was used because the base coordinates for each theoretical value type are exactly defined and represent the basic values in the theoretical circular structure as proposed by Schwartz (2003). By doing so, a uniform creation of the MDS in the sense of the value theory is guaranteed and the determined MDS of the farmers can be compared with the model (Bilsky et al., 2011). By using a design matrix as a basis, the MDS is a weak confirmatory MDS. Kruskal's stress-I measure is used as a quality criterion of the MDS to measure the stresses of the solutions. The perfect solution is present at stress-I = 0, an excellent solution is present at stress-I < 0.025, for < 0.05 the solution is considered good, for < 0.1 it is considered sufficient and for < 0.2 it is considered deficient (Kruskal, 1964; Borg and Staufenbiel, 2007).

4.3 Clustering

Clustering is a form of unsupervised learning. The aim is to identify patterns within the data set and to create groups where the members are as similar as possible within the same group and as different as possible between the groups (Lesmeister, 2015). The aim of using a clustering approach subsequent to the value analysis is to identify differences within the value portraits of the sample of farmers. As throughout the evaluation process the ten basic variables turned out to be not sufficiently reliable in isolation, the four higher order values were used for the clustering. Other studies tackled this issue in a similar manner, e. g. Baur et al. (2016) or Dobricki (2011).

In general, clustering methods are distinguished into hierarchical and partitioning approaches. As the data is quasimetric, a lot of different methods can be applied. To identify outliers, we first applied a hierarchical method using Euclidean Distance and Single Linkage (Backhaus et

al., 2018). Thus, nine observations were excluded from the sample. For the final clustering k-means using Euclidean distance measure was chosen. This method can handle big data sets and results in an even and reasonable distribution of the observations at hand. K-means minimises the within-cluster variation and iterates until each observation belongs to just one cluster. In contrast to the hierarchical clustering, each observation can be reshuffled to the cluster with the centroid. A precondition is to specify the number of clusters beforehand (Lesmeister, 2015).

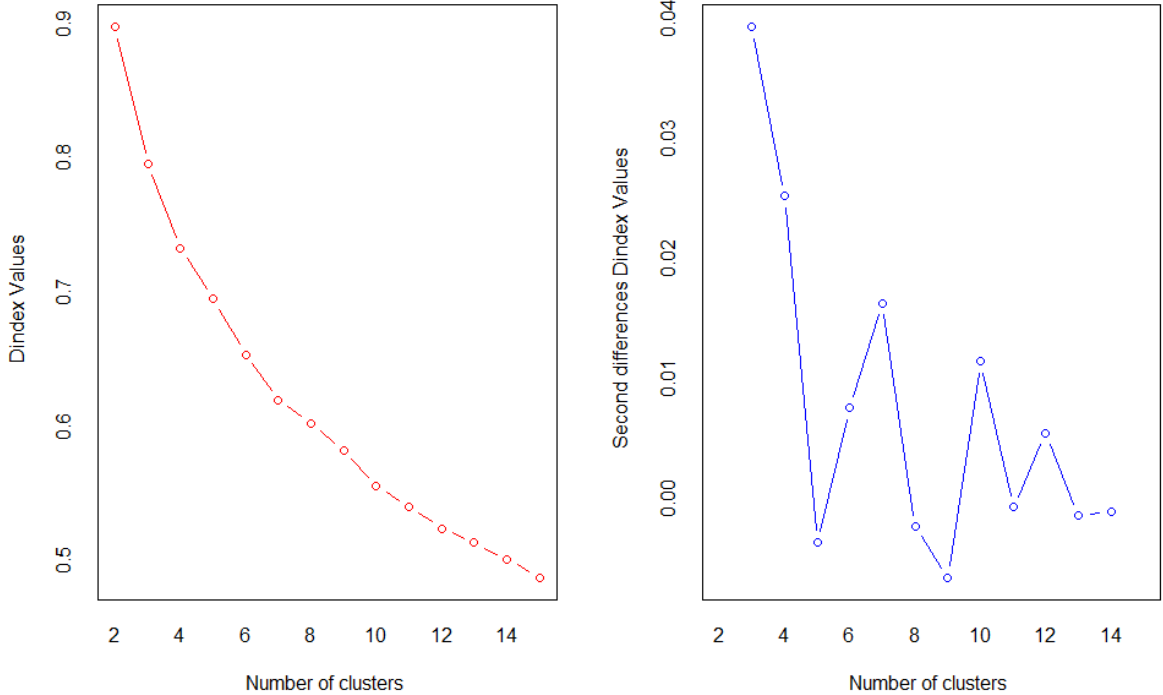


Figure 2: Results of the Elbow method

To determine the best number of clusters, the Elbow method using the within-cluster sum of squares is used. This reveals that three is the optimal number of clusters as illustrated in Figure 2. Furthermore, the 23 other criteria for selecting the optimal number of clusters provided by R programme NbClust() command were considered as well whereby a majority of eight confirmed the optimal number of three clusters.

To compare the clusters in relation to different farmer and farm characteristics, arithmetic means and their standard deviations are calculated along with the p-values to test equality between groups.

5 Results and Discussion

The results of the MDS are presented and discussed first to approve the value theory. These are followed by the value portrait of the overall sample and finally the value clusters within the sample.

5.1 Visualisation and applicability of the value portrait

The results of the MDS, as illustrated in Figure 3, represent the circular arrangement of the ten value types from the theoretical value model in Figure 1. More strongly correlating value pairs, such as benevolence and universalism, are closer together where opposite value pairs,

such as hedonism and tradition, are further apart. Furthermore, there is conformity with theory in the regional arrangement of the four higher-order value pairs.

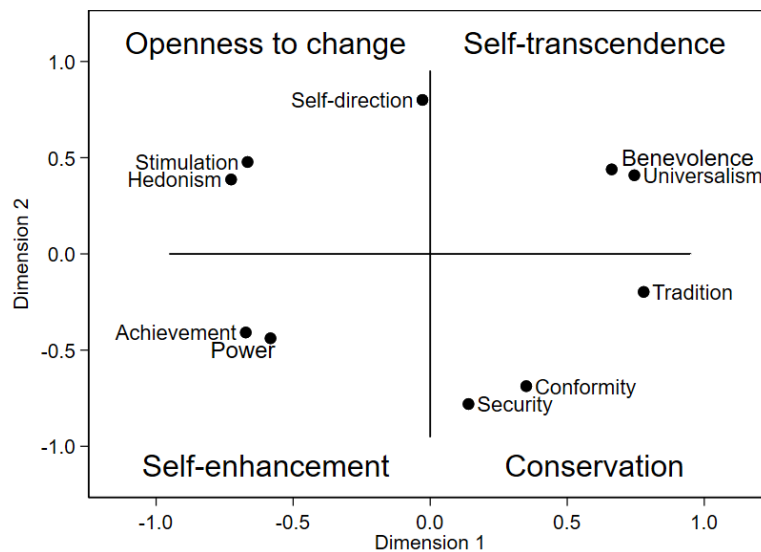


Figure 3: Results of the MDS (N=787)

There are some slight differences to the theory. Some of the positively correlating pairs of values are closer to each other than the value theory would suggest. Benevolence and universalism are interchanged in the present MDS. Conformity is closer to the value security instead of being a bit more in the centre in front of the value tradition. The values tradition and self-direction have a large distance to their higher order partners and lie separately in the solution. Tradition is as positively correlated with universalism ($r = 0.12$) as it is with conformity ($r = 0.12$). This could indicate that tradition in the agricultural context is also connected to self-transcendent values. Running the family farm might be associated with the preservation of the family welfare and a protection of the cultural landscape, which in turn are self-transcendent values (Pongratz, 1991). It might also be an issue of the wording of the items as it occurs in other studies applying the PVQ as well. The separate position of the value self-direction may be explained by the findings of Inhetveen and Schmitt (2010) and Niska et al. (2012) who find top priorities for farmers' independence, self-determination and autonomy. From these results it can be concluded that farmers distinguish this value more strongly from hedonism and stimulation. However, the stress-I measure of the MDS is 0.036, meaning that the quality of the model can be described as good (Kruskal, 1964). Thus, the value theory according to Schwartz (1992) proves to be an appropriate method for mapping and structuring the value orientation of farmers.

Before computing the MDS, the reliability of the ten raw indices was analysed by their Cronbachs α between the respective items. The values hedonism ($\alpha = 0.74$) and stimulation ($\alpha = 0.68$) are best described by their items. Since the basic values are described by only two or three items, Schwartz (2005a) sets a lower Cronbachs $\alpha \geq 0.4$. Tradition ($\alpha = 0.23$) fails to reach this threshold and both power ($\alpha = 0.36$) and self-direction ($\alpha = 0.37$) barely pass. The Cronbachs α improve after merging to the four higher order values: openness to change $\alpha = 0.72$, self-enhancement $\alpha = 0.66$, self-transcendence $\alpha = 0.62$, and conservation $\alpha = 0.61$.

This is why the following calculations focus on the higher order values, as previous studies did as well (e. g. Dobricki, 2011; Baur et al., 2016).

5.2 Description of the overall value portrait

Regarding the value priorities of the whole sample as described in Table 3, self-transcendence is the most pronounced value (mean (M) = 0.47), followed by openness to change (M = 0.12). Conservation (M = -0.26) and self-enhancement (M = -0.37) which are less dominant in the farmers' value portrait. The high ranking of openness to change and the low ranking of conservation contradicts the findings of previous studies using the PVQ among farmers. Dobricki (2011) finds top priority for conservation and least for openness to change for farmers from Switzerland. For German farmers, Baur et al. (2016) find conservation second (M = 0.31) and openness to change third priority (M = -0.5). One reason for this might be due to the composition of the samples with regards the age distribution. While farmers in the studies of Dobricki (2011) and Baur et al. (2016) are 60 years on average, the mean age of farmers in this sample is 38 years. It might be argued that the present sample reflects the value portrait of the active and upcoming farmer generation, and thus is more future-oriented. In order to sustain the change process towards a more multifunctional agriculture and new development pathways (Kirschke et al., 2007; DBV, 2018; Grethe et al., 2018), it may be argued that the farmers of the sample at hand are open for change and are less conservative than the previous farmers have been.

The higher order value openness to change includes the motivational values stimulation, describing a strive for novelty and challenges, hedonism, being characterised by pleasure, enjoying life and self-indulgence, as well as self-direction which includes creativity, independence, freedom and curiosity (Schwartz, 1992). Inhetveen and Schmitt (2010) as well as Niska et al. (2012) stress the major importance of autonomy values, independence and self-determination of farmers, which also because of its placement (see Figure 3), play a special role in the value concept of the sample at hand. These findings, in combination with the aforementioned aspects like creativity and a strive for novelty are a prerequisite for entrepreneurial action (Hébert and Link, 1988; van Praag, 1999; EC, 2003) and rated to be of major importance for the farmers within the sample. This suggests that farmers' deep motivational drivers are well compatible with the changing requirement profile constituting a catalyst for entrepreneurship (Hemingway, 2005).

Conservation as a third priority implies respect for tradition, conformity as well as security (Schwartz, 1992). Laoire (2002) attributes low rankings of conservational values to the fact that external conditions such as increased competitiveness on the world market, are causing traditional values to lose relevance, especially among the younger generation, and are increasingly being replaced by entrepreneurial approaches. Bilsky et al. (2011) come to similar conclusions, noting that as interest in unique, new, challenging tasks expressed by the growth values of universalism, benevolence and self-determination increases, there is a simultaneous decline in preferences for traditions and norms.

	1	2	3	p.overall
	N=284	N=268	N=235	
<i>Higher-order values included within cluster analysis</i>				
Self-transcendence	0.17 (0.47)	0.46 (0.47)	0.85 (0.43)	<0.001
Openness to change	0.43 (0.41)	-0.42 (0.41)	0.34 (0.44)	<0.001
Self-enhancement	0.12 (0.45)	-0.29 (0.50)	-1.06 (0.43)	<0.001
Conservation	-0.66 (0.46)	0.22 (0.34)	-0.34 (0.42)	<0.001
<i>Descriptive variables</i>				
Age	34.0 (11.3)	39.2 (12.5)	42.7 (13.6)	<0.001
Male	0.87 (0.34)	0.85 (0.36)	0.82 (0.38)	0.312
Degree	0.48 (0.50)	0.40 (0.49)	0.37 (0.49)	0.027
Edu_agr	0.90 (0.30)	0.87 (0.33)	0.89 (0.31)	0.623
Partnership	0.70 (0.46)	0.74 (0.44)	0.82 (0.38)	0.005
Job	0.28 (0.45)	0.34 (0.47)	0.28 (0.45)	0.261
Childhood	1.18 (0.59)	1.26 (0.67)	1.29 (0.72)	0.157
Risk	6.60 (1.73)	5.06 (1.85)	6.36 (1.79)	<0.001
Position	0.56 (0.50)	0.69 (0.46)	0.76 (0.43)	<0.001
Familyfarm	0.89 (0.32)	0.87 (0.34)	0.88 (0.33)	0.742
Size	300 (608)	343 (694)	293 (593)	0.621
Size_initial	230 (542)	273 (616)	249 (596)	0.690
Fulltime	0.89 (0.32)	0.82 (0.38)	0.89 (0.31)	0.032
Organic	0.08 (0.28)	0.11 (0.31)	0.15 (0.36)	0.066
Foc_arable	0.69 (0.46)	0.66 (0.47)	0.73 (0.44)	0.251
Foc_fordairy	0.31 (0.46)	0.34 (0.48)	0.28 (0.45)	0.269
Foc_foroath	0.13 (0.34)	0.21 (0.40)	0.17 (0.38)	0.061
Foc_refine	0.31 (0.46)	0.31 (0.46)	0.31 (0.46)	0.981
Foc_horti	0.02 (0.16)	0.01 (0.11)	0.03 (0.17)	0.327
Foc_perma	0.08 (0.27)	0.05 (0.22)	0.06 (0.24)	0.283
Div_agr	0.47 (0.50)	0.44 (0.50)	0.43 (0.50)	0.663
Div_str	0.51 (0.50)	0.38 (0.49)	0.46 (0.50)	0.009
Renew_en	0.56 (0.50)	0.54 (0.50)	0.58 (0.49)	0.681
Soil	46.8 (17.9)	47.6 (18.4)	47.1 (17.6)	0.865
Rain	702 (176)	717 (194)	680 (167)	0.062
West	0.89 (0.31)	0.84 (0.37)	0.83 (0.38)	0.057
Central	0.13 (0.34)	0.09 (0.29)	0.10 (0.30)	0.288
Wf_family	2.04 (1.17)	1.78 (1.07)	1.76 (1.04)	0.004
Wf_spouse	0.31 (0.46)	0.37 (0.48)	0.37 (0.48)	0.200
Coop	0.78 (0.41)	0.78 (0.41)	0.76 (0.43)	0.812

Table 3: Descriptive statistics of the value clusters

The high ranking of self-transcendence values is in line with the findings of Baur et al. (2016) who find a mean of 0.75 for German farmers. In other studies those values can also be found among top priorities, though not necessarily first priority (Parminter and Perkins, 1997; Dobricki, 2011; Niska et al., 2012). Universalism is a part of this higher order value being shaped by objectives for tolerance and protection for the welfare of all people and for nature

(Schwartz, 1992). This fits the demand for a higher social contribution to the long-term conservation of nature and its resources throughout agriculture (Morris and Potter, 1995; Kuhnert, 1998; Rudmann, 2008; Grethe et al., 2018). This may also be an explanation for the producer identity of farmers described in other studies (Gonzalez and Benito, 2001; Burton, 2004; Burton and Wilson, 2006; Oreszczyn et al., 2010; Vesala and Vesala, 2010).

Benevolence is a component of the higher order value self-transcendence as well, which is further described by the adjectives responsible, helpful, honest, forgiving, loyal and responsible (Schwartz, 1992). The sample consists mainly of family farms so that the prioritisation of benevolence expresses inter alia the family interests of the farmer, which are considered to be particularly important regarding the special position between private and professional interests (Ilbery, 1978; Gasson and Errington, 1993; Fairweather and Keating, 1994). Similarly, Gasson and Errington (1993) show that honesty is one of the most important values of farmers.

In accordance with the existing literature, farmers rate self-enhancement values as less important (Gasson and Errington, 1993; Dobricki, 2011; Baur et al., 2016). Baur et al. (2016) find a mean of -0.88 for German farmers. Prestige, status, dominance and personal success are less important to them, still it needs to be mentioned that this is just in relation to the degree of the expression. All values are present in the farmers' value portrait. Parminter and Perkins (1997) find farmers from New Zealand identify primarily with values in pursuit of entrepreneurial goals and interpret the achievement of these values as their personal success, which distinguishes them from the general population. Thus, a lower expression of self-enhancement values does not necessarily mean a low expression of entrepreneurship, but self-enhancement might not be the major motivation for their action. What is furthermore worth noting is that the low expression of self-enhancement and the high expression of self-transcendence are in line with the findings from Diekmann and Theuvsen (2019) analysing a German sample, thus, German farmers value portrait of the sample seems not to differ completely from the whole German population.

5.3 Different value portraits resulting from the cluster analysis

Having analysed the overall value portrait of German farmers, the question that follows is which different value portraits can be distinguished within the sample and if special farmer or farming types are connected with these. Cluster analysis reveals that three different value portraits can be distinguished on the basis of the higher-order-values, which differ significantly in their value portrait as illustrated in Figure 4.

Farmers within Cluster 1 are characterised by the strongest extent of openness to change and the least expression of conservation as opposing value pairs. Self-transcendence and self-enhancement are relatively equally pronounced. In comparison with the other clusters, they show the lowest level of self-transcendence and the highest level of self-enhancement. Having a closer look at the descriptive statistics in Table 3, these farmers are rather young, well-educated and risk affine. They have the highest share of farm successors within their group, highest shares of diversification activities and most family workers being engaged in the business.

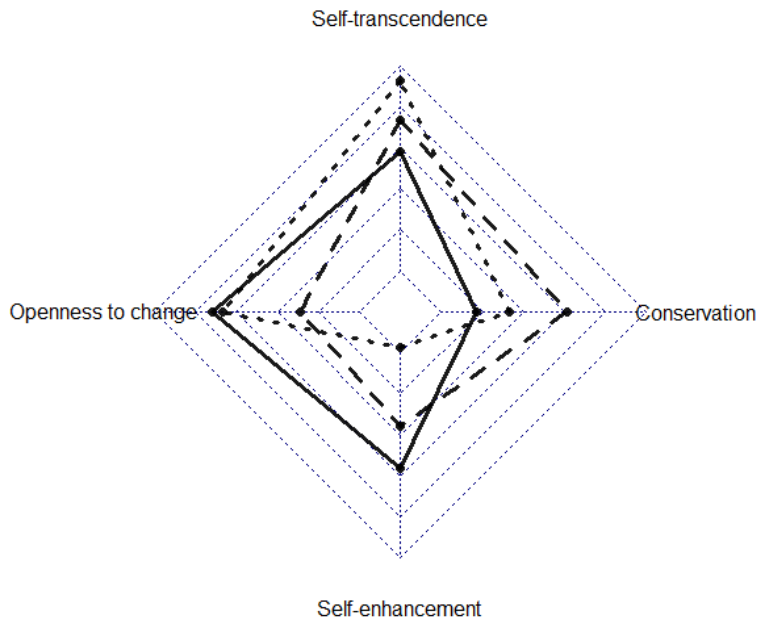


Figure 4: Different value portraits of farmers

Note: — Cluster 1; --- Cluster 2; Cluster 3

Cluster 2 distinguishes from the other clusters by having a distinct conservative value orientation and least expression of openness to change. They place high emphasis on self-transcendent values. Self-enhancement is ranked third priority. These farmers are risk neutral, showing the lowest risk affinity among all. The group contains 18 % of part-time farmers which can be interpreted in line with the low risk affinity and the lower degree of openness to change and the lowest rate of structural diversification. Instead of risking something new in the light of structural change and a political push towards multifunctionality in agriculture (Grethe et al., 2018; DBV, 2019), some of them rather rely on revenues from outside the farm yard.

Farmers of Cluster 3 put the highest emphasis of all clusters on self-transcendence, self-enhancement being the least important value. They also emphasise openness to change while they are less conservative. Regarding their characteristics, they are the oldest farmers and thus, they are the farmers with the highest percentage of having a spouse and contain the least number of successors within the sample. They are risk affine and 46 % of them pursue structural diversification.

What is striking is that self-transcendence is the most important value for Clusters 2 and 3 and is ranked second for Cluster 1. Comparing Clusters 1 and 3 reveals that openness to change is of major importance for the youngest and the oldest clusters (34 and 43 years old). This contradicts the findings of Baur et al. (2016), who claim that older farmers are more conservative; still, the farmers within the sample at hand are younger in general. Openness to change appears to be more related to risk affinity resulting in structural diversification. This is the only variable which differs significantly among the groups in terms of the farm organisation. Apparently, there is no value portrait determining a special agricultural focus. All value portraits are rather equally distributed among the foci.

6 Conclusions

Against the background of fundamentally changing political and social requirements of agricultural production, the requirement profile of farmers has changed. The future of agriculture is widely discussed. To prepare a ground for future debates and policy programme design, it is essential to gain a better understanding of what underlies farmers' behaviour. This is where values come into play. This paper applies Schwartz' value theory to a large quantitative survey (N = 787) of German farmers. Next to the overall value portrait, different value portraits within the sample of farmers are analysed.

The high priority of openness to change and the rather low rating of conservation indicate that the value structures of the farmers within the sample are well compatible with current challenges of a changed requirement profile. The high ranking of self-transcendence means that tolerance and protection for the welfare of people and nature is a matter of great concern to these farmers as well as honesty, loyalty and responsibility. These values are of major importance across the whole sample.

The identified value portraits of the farmers do not correspond with existing conventional farm types, for instance specialised arable, diary or refinement farms. At the same time, the clusters differ with regards to the involvement in structural diversification. With distinct values of openness to change this occurs more often. These farmers are also more risk affine. This implies that the uptake of activities beyond the traditional farming business might be indeed motivated by a special value portrait. Farmers of the more conservative cluster show a higher percentage in part time farming. Thus, the political motivated goal of multifunctionality in agriculture is a concept which cannot be applied to all farmers to the same extent. Every one of them should get the chance to act according to their inner value portrait. Thus, for farmers themselves, it is important to figure out what their inner value preferences are in order to set their goals accordingly. Personal coaching and training might be helpful for this.

The high rankings in self-transcendence across all clusters reveal that the motivational drivers for an enhanced sustainable action are well-present within the farmers' value portrait. In order to find good solutions, debates about the future of agriculture should rather focus on what deeply motivates farmers to use certain practices and then set goals and the corresponding policy programmes accordingly. By bringing the discussion to a higher level instead of affirming prejudices of political affiliations, commonalities between farmers, nature conservation organisations, and politicians might be found and lead finally to successful solutions. This might also apply for the communication between farmers and society in general.

Furthermore, the high ranking of self-transcendence reveals another issue concerning the communication of current policies; in advertising entrepreneurship and new ways of production, programmes need to focus rather on the benefit for the greater good, such as nature, society and farming families, than the personal success of the single farmer to become widely accepted and adopted.

As limitations of the study it should be mentioned that the sample is rather big but not completely representative for German farmers, especially regarding the age distribution and the education level. Furthermore, SCHWARTZ' value theory is based on self-assessment bearing the risk of being subjective. As a field for future research, the present approach could be ap-

plied to other countries to be able to draw comparisons with regard to the value portraits of different farmer groups. Additionally, the farmers' value portrait might be compared to the German average.

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Appendix A

Item		First-order value constructs	Higher-order value constructs
1	Thinking up new ideas and being creative is important to him. He likes to do things in his own original way.	Self-direction	Openness to change
2	It is important to him to be rich. He wants to have a lot of money and expensive things.	Power	Self-enhancement
3	He thinks it is important that every person in the world should be treated equally. He believes everyone should have equal opportunities in life.	Universalism	Self-transcendence
4	It is important to him to show his abilities. He wants people to admire what he does.	Achievement	Self-enhancement
5	It is important to him to live in secure surroundings. He avoids anything that might endanger his safety.	Security	Conservation
6	He likes surprises and is always looking for new things to do. He thinks it is important to do lots of different things in life.	Stimulation	Openness to change
7	He believes that people should do what they are told. He thinks people should follow rules at all times, even when no-one is watching.	Conformity	Conservation
8	It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them.	Universalism	Self-transcendence
9	It is important to him to be humble and modest. He tries not to draw attention to himself.	Tradition	Conservation
10	Having a good time is important to him. He likes to “spoil” himself.	Hedonism	Openness to change
11	It is important to him to make his own decisions about what he does. He likes to be free and not depend on others.	Self-direction	Openness to change
12	It is very important to him to help the people around him. He wants to care for their well-being.	Benevolence	Self-transcendence
13	Being very successful is important to him. He hopes people will recognize his achievements.	Achievement	Self-enhancement
14	It is important to him that the government ensures his safety against all threats. He wants the state to be strong so it can defend its citizens.	Security	Conservation
15	He looks for adventures and likes to take risks. He wants to have an exciting life.	Stimulation	Openness to change
16	It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong.	Conformity	Conservation
17	It is important to him to get respect from others. He wants people to do what he says.	Power	Self-transcendence
18	It is important to him to be loyal to his friends. He wants to devote himself to people close to him.	Benevolence	Self-transcendence
19	He strongly believes that people should care for nature. Looking after the environment is important to him.	Universalism	Self-transcendence
20	Tradition is important to him. He tries to follow the customs handed down by his religion or his family.	Tradition	Conservation
21	He seeks every chance he can to have fun. It is important to him to do things that give him pleasure.	Hedonism	Openness to change

Table A-1: 21 items of the PVQ, male form (Baur et al., 2016)



Diskussionspapiere

2000 bis 31. Mai 2006

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Georg-August-Universität, Göttingen

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0002	von Cramon-Taubadel, S. u. J. Meyer	Asymmetric Price Transmission: Factor Artefact?, 2000
<u>2001</u>		
0101	Leserer, M.	Zur Stochastik sequentieller Entscheidungen, 2001
0102	Molua, E.	The Economic Impacts of Global Climate Change on African Agriculture, 2001
0103	Birner, R. et al.	„Ich kaufe, also will ich?": eine interdisziplinäre Analyse der Entscheidung für oder gegen den Kauf besonders tier- u. umweltfreundlich erzeugter Lebensmittel, 2001
0104	Wilkins, I.	Wertschöpfung von Großschutzgebieten: Befragung von Besuchern des Nationalparks Unteres Odertal als Baustein einer Kosten-Nutzen-Analyse, 2001
<u>2002</u>		
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0301	Lüth, M. et al.	Qualitätssignaling in der Gastronomie, 2003
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Ab Heft 4, 2007:		Diskussionspapiere (Discussion Papers), Department für Agrarökonomie und Rurale Entwicklung Georg-August-Universität, Göttingen (ISSN 1865-2697)
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	u. R. Marggraf	tions – a choice experiment analysis
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1108	Recke, G., L. Theuvsen, N. Venhaus u. A. Voss	Der Viehhandel in den Wertschöpfungsketten der Fleischwirtschaft: Entwicklungstendenzen und Perspektiven
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		-Potentiale in der Zusammenarbeit zwischen Milcherzeugern und Molkereien aus Landwirtssicht
1213	Mußhoff, O., A. Tegtmeier u. N. Hirschauer	Attraktivität einer landwirtschaftlichen Tätigkeit - Einflussfaktoren und Gestaltungsmöglichkeiten
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1301	Lakner, S., C. Holst u. B. Heinrich	Reform der Gemeinsamen Agrarpolitik der EU 2014 - mögliche Folgen des Greenings für die niedersächsische Landwirtschaft
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1303	Granoszewski, K. u. A. Spiller	Langfristige Rohstoffsicherung in der Supply Chain Biogas : Status Quo und Potenziale vertraglicher Zusammenarbeit
1304	Lakner, S., C. Holst, B. Brümmer, S. von Cramon-Taubadel, L. Theuvsen, O. Mußhoff u. T.Tscharntke	Zahlungen für Landwirte an gesellschaftliche Leistungen koppeln! - Ein Kommentar zum aktuellen Stand der EU-Agrarreform
1305	Prechtel, B., M. Kayser u. L. Theuvsen	Organisation von Wertschöpfungsketten in der Gemüseproduktion : das Beispiel Spargel
1306	Anastassiadis, F., J.-H. Feil, O. Musshoff u. P. Schilling	Analysing farmers' use of price hedging instruments : an experimental approach
1307	Holst, C. u. S. von Cramon-Taubadel	Trade, Market Integration and Spatial Price Transmission on EU Pork Markets following Eastern Enlargement
1308	Granoszewski, K., S. Sander, V. M. Aufmkolk u. A. Spiller	Die Erzeugung regenerativer Energien unter gesellschaftlicher Kritik : Akzeptanz von Anwohnern gegenüber der Errichtung von Biogas- und Windenergieanlagen
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1410	Spiller, A. u. B. Goetzke	Zur Zukunft des Geschäftsmodells Markenartikel im Lebensmittelmarkt
1411	Wille, M.	„Manche haben es satt, andere werden nicht satt“ : Anmerkungen zur polarisierten Auseinandersetzung um Fragen des globalen Handels und der Welternährung
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1502	Schneider, T., L. Hartmann u. A. Spiller	Luxusmarketing bei Lebensmitteln : eine empirische Studie zu Dimensionen des Luxuskonsums in der Bundesrepublik Deutschland
1503	Würriehausen, N. u. S. Lakner	Stand des ökologischen Strukturwandels in der ökologischen Landwirtschaft
1504	Emmann, C. H., D. Surmann u. L. Theuvsen	Charakterisierung und Bedeutung außerlandwirtschaftlicher Investoren : empirische Ergebnisse aus Sicht des landwirtschaftlichen Berufsstandes
1505	Buchholz, M., G. Host u. Oliver Mußhoff	Water and Irrigation Policy Impact Assessment Using Business Simulation Games : Evidence from Northern Germany
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1507	Riechers, M., J. Barkmann u. T. Tschardt	Bewertung kultureller Ökosystemleistungen von Berliner Stadtgrün entlang eines urbanen-periurbanen Gradienten
1508	Lakner, S., S. Kirchweber, D. Hopp, B. Brümmer u. J. Kantelhardt	Impact of Diversification on Technical Efficiency of Organic Farming in Switzerland, Austria and Southern Germany
1509	Sauthoff, S., F. Anastassiadis u. O. Mußhoff	Analyzing farmers' preferences for substrate supply contracts for sugar beets
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1969/70 wurde durch Zusammenschluss mehrerer bis dahin selbständiger Institute das **Institut für Agrarökonomie** gegründet. Im Jahr 2006 wurden das Institut für Agrarökonomie und das Institut für RURale Entwicklung zum heutigen **Department für Agrarökonomie und RURale Entwicklung** zusammengeführt.

Das Department für Agrarökonomie und RURale Entwicklung besteht aus insgesamt neun Lehrstühlen zu den folgenden Themenschwerpunkten:

- Agrarpolitik
- Betriebswirtschaftslehre des Agribusiness
- Internationale Agrarökonomie
- Landwirtschaftliche Betriebslehre
- Landwirtschaftliche Marktlehre
- Marketing für Lebensmittel und Agrarprodukte
- Soziologie Ländlicher Räume
- Umwelt- und Ressourcenökonomik
- Welternährung und rurale Entwicklung

In der Lehre ist das Department für Agrarökonomie und RURale Entwicklung führend für die Studienrichtung Wirtschafts- und Sozialwissenschaften des Landbaus sowie maßgeblich eingebunden in die Studienrichtungen Agribusiness und Ressourcenmanagement. Das Forschungsspektrum des Departments ist breit gefächert. Schwerpunkte liegen sowohl in der Grundlagenforschung als auch in angewandten Forschungsbereichen. Das Department bildet heute eine schlagkräftige Einheit mit international beachteten Forschungsleistungen.

Georg-August-Universität Göttingen
Department für Agrarökonomie und RURale Entwicklung
Platz der Göttinger Sieben 5
37073 Göttingen
Tel. 0551-39-4819
Fax. 0551-39-12398
Mail: bibliol@gwdg.de
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