

Values and Social Entropy in Organisational Systems: Monitoring Organisational Change by Values –

Case study of a quantitative assessment of the effectiveness of a new approach to
care for elderly patients with dementia

Provisional description and conclusion of findings

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October 2018

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Acknowledgements

The study presented in this paper was supported by ZonMW and Avoord. They gave us the opportunity to do the research on organizational change. We also thank our colleagues from Avoord and Radboud University who provided insight and expertise that greatly assisted the research.

Chapter 1. Abstract

This Research paper describes the Scale called 'Monitoring Organizational Change by Values'. This scale was developed to give a rigorous underpinning of organisational change by focusing on the coherence of values within an organisation. The Scale aims to provide a tool that can help assess whether such change can be regarded as positive or negative for an organisation based on the notion of 'cultural entropy'. Cultural entropy is the dispersion of values within an organisation and the level of incoherence between perceived values of self and the organisation.

A scale was developed to monitor organisational transformation by measuring changed levels in cultural entropy within an organisation. The scale is based on the notion that the values of an organisation, as formulated for example in their mission statement, can be regarded as an anchor point to quantify the values ascribed to the organisation and the self. The distance between the ascribed values to self and the organisation indicate cultural entropy. The objective of the Monitoring Organizational Change by Values scale is to assess organisational transformation by monitoring changes in values in the organisation by means of a quantified increase or decline of cultural entropy.

The concept of cultural entropy and the scale developed to measure it, was tested in a quantitative measurement of the adoption of a new approach to care for elderly patients with dementia in an elderly home in The Netherlands. In this assessment the direction of the change towards an ideal set of values based on an assessor's definition (e.g. the adoption of the new approach) was measured in conjunction with cultural entropy: the difference between the values ascribed to the organisation and the self.

The results showed that organisational entropy was accompanied by increased organisational adherence to the ideal set of values based on the direction desired by new approach. Through a qualitative data collection and analysis (interviews, focus group and observations) the outcome of the quantitative measurement was triangulated. The conclusions of the qualitative analysis convincingly confirmed the internal validity of the Monitoring Organizational Change by Values-Scale.

Chapter 2. Monitoring Organizational Change by Values (MOCV) scale

It is generally accepted that different value orientations cause variations in behaviors of persons, social groups and organizations. Values indicate how an individual should (preferably) behave in a specific social situation. Therefore, the values a person hold, signify what behavior is preferable in a particular social situation and the values held by other persons in the same social situation indicate what behavior can be expected in that situation (Ajzen, 1991; Bandura, 2001, Peck & Norman, 1999; Stryker, 2008).

The term 'value' has been defined as "an enduring prescriptive or proscriptive belief that a specific end state of existence or specific mode of conduct is preferred to an opposite end state or mode of conduct for living one's life"(Kahle, 1983; Rokeach, 1968, 1973; Kahle, Beatty, & Homer, 1986).

This definition can be explored in the following way:

- 'Enduring' does not mean that values cannot change, but that they will change only gradually due to accumulated experiences. This is a social change process, since values are a kind of social conventions that indicate how one should behave in a social situation. In other words: values are normative beliefs that indicate the preferable behavior to be conducted by the actor as well as the behavior to be expected by others (see also Ajzen 2001).
- A distinction is made between 'mode of conduct' (instrumental values) and 'end state of existence' (terminal values). 'Instrumental values' are motivators to reach an end-state of existence (see table 1).
- Not all values a person hold, are equally important in living one's life. It is believed that 'terminal values' are more abstract than 'instrumental values' in that they affect more than one instrumental value. In this respect they have a larger impact on a person's life.
- Since values differ in their importance to proscribe social behaviour, they are ordered in their priority with respect to other values in a value system.

Shared values make social behavior within a social situation (group or organization) easier. For the individual, the shared values signify the preferred mode of conduct, and for the other people involved in the social situation it indicates what behavior can be expected and how one should react upon (Peck & Norman, 1999). But values are learnt by socialization, and differ between social groups, organizations and sub-cultures. Since individuals interact within different social groups and/or organizations, the values an individual acknowledges as important, are not necessarily regarded as important by the social group or organization.

Table 1 Instrumental and terminal values

Instrumental values	Terminal values
Competence Ambitious (hard working) Independent (self-reliant) Imaginative (creative) Capable (competent) Logical (rational) Courageous	Social harmony World at peace Equality (brotherhood) Freedom (independence) National security Salvation (eternal life)
Compassion Forgiving (pardon others) Helpful (work for others) Cheerful (joyful) Loving (affectionate)	Personal gratification Social recognition Comfortable life Pleasure (enjoyable life) Sense of accomplishment
Sociality Polite (courteous) Obedient (dutiful) Clean (neat, tidy)	Self-actualization Beauty (nature and arts) Wisdom (understanding) Inner harmony (no conflict) Self-respect (self-esteem) Sense of accomplishment
Integrity Responsible (reliable) Honest (sincere) Self-controlled	Security Taking care of family Salvation (eternal life)
	Love and affection Mature love (sexual and spiritual intimacy) True friendship (close companionship)
	Personal contentedness Happiness (contentment)

Based on: Rokeach (1973).

Chapter 3. Concepts of Organisational Change based on Values

Since shared values regulate social behaviour (Ajzen, 1991; Stryker, 2008) within a specific social situation as an organisation (Peck & Norman, 1999), they provide a base to study organisational change.

3.1 Cultural entropy: The difference between ascribed personal values and organizational /community values

Barret (2013) makes an explicit distinction between the values an individual sees as important for him/herself and the values that he/she regards as important (leading principle) by a social group (or organization). Barrett (2013, p. 3) argues that values are “a shorthand method of describing what is important to us individually or collectively at any given moment in time”. Values are, therefore, universal in that they transcend context (and time) (Barrett, 2013, p. 3). The value system an individual ascribed to for him/herself does not necessarily overlap with the value system the individual ascribes to a social group (community) or organization.

According to Barrett misalignment of a personal value systems and an organizational value system undermines effective behavior. In that case the preferred mode of conduct of an individual triggered by the personal value system does not correspond to the mode of conduct signified by the organizational value system. In this case, a person is obliged to do something that is not the best option or decision within the situation (since it is either in conflict with the personal value system or the organisational value system). People experience this as frustrating. The result is that a person has to invest more energy to get the job done and that the job provides the person with less energy (less satisfaction and relevance/meaning). This difference in energy is called “cultural entropy” since it is caused by factors (such as values) that are believed to be at the base of the culture of an organization (Barrett, 2010; 2013). However, if the ascribed values of the organization are more aligned with the personal value system, then members of the organization will be able to bring more effort and positive energy to contribute to it.

This line of reasoning indicates that values provide a base to explore the effectiveness of an organisation in two different ways:

1. Value recognition. To what extent are the values of the organisation, as mentioned in for example the mission statement or policy, acknowledge by different groups in the organisation (such as employees and management staff)?

2. Cultural entropy. What is the difference between the ascribed values to the self and the organisation?

In order to manage organisational change, we developed a procedure, which was inspired by Barrett (2013), namely to monitor and facilitate Value Transformation and Entropy in Organizational Systems.

The procedure is based on quantitative and qualitative methods. The quantitative method (a list of values) provides the data to estimate the acknowledgement of the (stated) organisational values by different groups of employees, as well as cultural entropy. While the qualitative method (interviews and focus groups) facilitates the cultural transformation by making people aware of the difference in value systems (self and organization) and to confirm the appropriateness of the (new) organizational values system. The procedure can also be utilised to measure the effect of organisational transformation, assuming a value anchorpoint is available.

In this paper we will focus on the quantitative data. We will discuss the monitoring of the values of an organisation as well as cultural entropy successively.

3.2 Monitoring the values of an organisation

In monitoring the values of an organisation, it can be investigated to what extent individuals acknowledge the values of the organisation (as reflected in their personal value system) and recognise the values of the organisation in their work processes (as reflected in their organisational value system). This information provides the organisation(s) and its participants feedback on the extent to which the preferred mode of conduct of the organisation is accepted by individuals as well as the extent to which this mode of conduct is practiced in daily routines. The expectation is that, if all individuals have accepted the mode of conduct of the organisation and practice it in their daily routines, cultural entropy is minimal and the effectiveness of the organisation is maximal. If individuals do not acknowledge the values of the organisation and/or do not practice these values in their daily working routines, management may have to respond, given that the organisation is not optimally effective (and /or efficient) in reaching the goals set (in their mission statement for example).

Regularly, the interest of an organisation is not only informed by a desire to increase effectiveness or efficiency, but also by a desire to steer organisational values in a different direction. In this case, the management or other parts of the organisation may have identified a need to adapt values, perhaps to correspond better with changed environments or new ideas about the organisation. In this case

organisational change can be monitored in relation to an ideal set of values that reflect the desired situation and are formalised in the mission statement. This ideal set of values can be seen as derived from an assessor, it is the point of identification of values to which the organisation, in an ideal situation, should evolve.

The quality of the organisational change can be seen to be more positive, if the ascribed personal value system and the ascribed organisation value system of individuals move towards the reference point established by the outside assessor.

3.3 Monitoring cultural entropy to manage organizational change

The other indicator of the effectiveness of an organisation is cultural entropy. In essence, the difference between the ascribed personal and organizational values systems can be regarded as an operationalisation of the misalignment of corresponding value systems and is therefore an indicator of cultural entropy. If we want to measure the quality of organisational change from a perspective of cultural entropy, the critical question is: how can we quantify value systems so that a difference between the value systems gives a valid indicator of cultural entropy? This is problematic since value systems have no natural Archimedean point. In consequence, the measurement of the ascribed personal value system is not commensurable with the measurement of the ascribed organizational value system (even if the same procedure is followed). Therefore, subtracting the measurement of the ascribed personal value system by the ascribed organisational value system will not result in a valid indicator of cultural entropy.

In order to solve this measurement problem, one has to determine a reference point to make the comparison between the ascribed personal value system and organisational value system meaningful. The reference point we suggest is the set of values that are indicated in the mission statement of the organisation and are at the core of the change process. This reference point is needed to quantify the alignment of the ascribed individual value system with the set of values of the organisation as well as the ascribed organisational value system with the set of values of the organisation. These alignments are commensurable, since they are measured with regard to the same reference point (e.g. the set of values of the organisation). In consequence one can subtract these alignments in order to get an indicator of cultural entropy what is measured at interval level.

Chapter 4. A Quantitative method to monitor Organisational Change by Values

In this section the quantitative method to measure the progression in organisation change through value systems is set out.

4.1 Procedure for Data Collection

The data collection requires the following steps:

a. Definition of the Value System relevant to the research domain

One is not interested in just any part of the value system of an individual. One is interested in that part of the value system that is related to the organization, since this part of the value system is most relevant in priming behaviour in the organisational context. In order to quantify the ascribed (personal and organisational) value system, one can construct a long list of values (In our research about 100, but 50 values would be sufficient) that are relevant in the social domain of the research (for example caregiving).

b. Establish Values of the Reference Point

In order to set the reference point, independent judges indicate what values out of the long list (created under a) reflect the organizational values (0: not applicable, 1: somewhat applicable; 2: very applicable). The applicability of the values is scored with regard to the objectives of the organization (since these values indicate how people should behave in this social context).

c. Interview respondents to establish their (personal) Values related to the Research Domain

Identify the values a person assigns to him/herself regarding the social domain of interest. This can be done by asking a person to pick the 10 most important values out of the long list of values (a) that are relevant for him/herself in this particular social domain (for example caregiving).

d. Interview respondents to establish their Values related to the Organisation in the Research Domain

Identify the values a person assigns to the organization regarding the social domain. This can be done by asking a person to pick the 10 most important values out of the long list of values (a) that describe the organization best.

4.2 Procedure for Statistical Analysis

In order to analyse the data to get information about (i) the personal and (ii) organisational value systems as well as (iii) the cultural entropy, the following steps are recommended:

1. The list that reflects the organizational values (b) as a reference point (established by independent judges) is used as statistical reference point to quantify the ascribed personal and organizational values system. The overlap between the values of the organization (b) and the values individuals ascribe to themselves (c) or the organization (d) is an index of the personal value system and organisational value system respectively. Hence, the personal value system is estimated by the overlap between the values of the organization (as defined in b) and the values a respondent assigns to him/herself (c). The perceived organizational value system is estimated by the overlap between the values of the organization (b) and the values the respondent assigned to the organization (d). By doing so, the values of the organisation (b) provides the null point of both value system scales.
2. Explore the personal value system and the organizational value system by:
 - i. Description of the personal and organizational values systems (Boxplots, means and standard deviation of the respective value systems) for different groups of employees and analyse the differences across groups of employees.
 - ii. Description and analyse the cultural entropy for different groups of employees. In order to do so, one explores the difference between the personal and organizational values systems for different groups of employees. If this difference is zero, cultural entropy is minimal.

This method was developed and successfully implemented and tested in a case-study about organizational change in an elder care organization.

Chapter 5. Case study: an Intervention to improve Elderly Care

The elderly care in the Netherlands is forced into a paradigm shift: from nursing elderly people towards self-reliance and autonomy by the elderly people. Government policy has established the need for this paradigm shift (Rijn, van, 2015) and elderly care organisations are required to respond to this shift in approach to elderly care. The implementation of self-reliance and autonomy of elderly people implies a new emphasis of a different kind of dialogue between the elderly person, his/her family and the professional care givers. It implies a change in values that govern the working processes of the professional caregivers as well as other stakeholders that are involved in the care processes of elderly people.

In order to facilitate such a paradigm shift in an elderly care organization, and assist in the generation of new work processes that cohere with the new values as introduced, the SOCAV approach was developed. The aim of the SOCAV approach is to improve self-reliance of elderly people with dementia in their daily lives by introducing and facilitating activities that are meaningful to them (at individual or collective level). The SOCAV approach focusses on the following person-centered care skills: observing, mirroring, communicating, and skills and proficiencies to support self-reliance and autonomy of elderly persons.

In order to test the SOCAV approach, it was implemented in an elderly care organization by training and coaching peer coaches and nurse assistance. The basic training program took 6 months and included:

- Group training by occupational therapist and psychologist
- Application in practice
- Individual coaching by a peer-coach
- Application in practice
- Group supervision

After the basic training, nursing assistants and care givers were coached on a monthly basis by a peer, for a period of six months.

In order to investigate whether the SOCAV approach facilitated the paradigm shift in values, from nursing elderly people to facilitation of self-reliance and autonomy of the elderly people, the investigators monitored whether the values associated with the work processes became more

aligned with the SOCAV values during the implementation of the SOCAV approach. According to Barrett (2010; 2013) the value systems of the different stakeholders involved in the work processes should move toward the SOCAV values during the implementation, if the organization has accepted and adopted the value transformation.

5.1 Data collection

In order to monitor the change in care values of different stakeholders during the implementation of the SOCAV approach, we followed the method as described in chapter 4.

The researcher constructed a long list of values that are relevant for elderly care on the basis of the work of Tronto (1993) and based on an application of elements of the procedure in another nursing home by Asmeredjo (2019, forthcoming). The list consisted of 108 value words to tap into the personal value system and 100 value words to tap into the organisational value system. The two long lists of value words are not exactly the same, since some value words are only relevant in describing personal values and others are relevant only in describing organisational values.

Since monitoring the implementation of the SOCAV procedure was the focus of this research, values that are at the core of the SOCAV procedure provided the reference point for the measurement of the value systems. The researcher together with several resource persons, well acquainted with the SOCAV method and its implied value transformation, served as independent judges. They indicated to what extent each value word mentioned on one of the lists was applicable to the SOCAV procedure (0: not applicable, 1: somewhat applicable; 2: very applicable). Based on these scores, the reference point was established.

In this case study, we were interested in the (personal and organisational) value systems of three groups that are involved in the organisational change process:

1. Clients,
2. Employees who provide the care
3. Management

The SOCAV procedure may have an impact on what values an individual ascribed to him/herself, the team of employees who provide the care, and the elderly care organisation. Therefore, the adoption of the SOCAV procedure was investigated (i) at the personal level (personal value system), (ii) the team level (team value system), and (iii) the organisational level (organisational value system).

There were two indicators of cultural entropy: one regarding the alignment between the personal and team value system and one regarding the personal and organisational value system.

The data collection was implemented by means of a questionnaire that was sent to a sample of clients (or representatives of the client) who agreed to participate in the study, all employees that were involved in the care process, and all members of the management team. The questionnaire entailed three tasks:

1. Respondents were asked to select maximally 10 value words to describe their personal values regarding care out of the list of 108 personal value words. The selected value words tap into their personal value system.
2. Respondents were asked to select maximally 10 value words to describe the team of caregivers out of the list of 100 organisational value words. The selected value words tap into their team value system.
3. Respondents were asked to select maximally 10 value words to describe the care organisation out of the list of organisational value words. The selected value words tap into their organisational value system.

If respondents wanted to use a value word that was not on the corresponding list, they were free to do so. These added value words were also rated by the independent judges to indicate the applicability to the SOCAV procedure.

The questionnaire was administered three times to each group of respondents:

- Wave 1: Spring/summer 2016 (at the start of the implementation of the SOCAV procedure)
- Wave 2: Spring 2017
- Wave 3: Autumn 2017 (at the end of the monitoring project).

Table 2 indicates the number of respondents in each group in each wave. Data-inspection reveals that a substantial number of respondents (n=23) of the first wave could not be assigned to one of the groups of interest in this research. These respondents were volunteers of the elderly care organisation.

Table 2 Number of respondents per group per wave

	Wave 1	Wave 2	Wave 3
Employees	113	38	64
Clients	87	45	37
Management	11	6	11
Not assigned	23	5	2

5.2 Statistical procedure

In order to estimate the scores for each respondent on the value systems that are relevant for this study, three scores were calculated:

1. A score regarding the personal value system, which indicates to what extent a personal value system aligns with the values associated with the SOCAV procedure (called here: SOCAV values). This score is calculated by summing the applicability scores of the values a respondent selected out of the personal value list (of 108 value words).
2. A score regarding the team value system, which indicates the extent to which a team value system aligns with the values associated with the SOCAV procedure. This score is calculated by summing the applicability scores of the values a respondent selected out of the organisational value list (of 100 value words) to describe the team of caregivers.
3. A score regarding the organisational value system, which indicates to what extent an organisational value system aligns with the values associated with the SOCAV procedure. This score is calculated by summing the applicability scores of the values a respondent selected out of the organisational value list (of 100 value words) to describe the care organisation.

Since every respondent was asked to pick maximally 10 values out of the corresponding value lists, the maximal score of each value system is 20 ($2 * 10$). Data inspection indicated that a few respondents scored higher than 20 on a specific value system (see table 3). This is probably due to the fact that those respondents picked more than 10 values out of a specific list of values. This tendency appeared strongest for the personal value system. In the analyses, values higher than 20 are regarded as missing values (another option is to set them at 20, the maximal value).

Table 3 The number of respondents with a score higher than 20 on a value system in a specific wave

	wave1	wave 2	wave 3
Personal value system	18	10	6
Team value system	1	3	5
Organisational value system	1	0	3

5.3 Exploring the value systems

In this section, the distribution of the value systems is explored, specifically: (i) the personal value system, (ii) the team value system, and (iii) the organisational value system across the three waves of the clients, the employees and management.

Figure 1: The distribution of the personal value system per group of respondents for each wave.

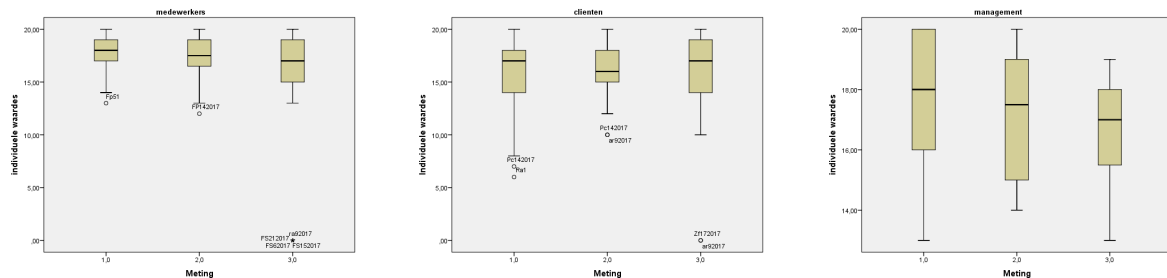


Figure 1 presents the distribution of the scores (by means of boxplots) of the personal value system across the three waves, for each group separately. This figure indicates that in the first and second waves no respondent has a score of 0 (that indicates no match with the SOCAV values). However, in the third wave, some employees and clients scored 0 on the personal value system, but figure 1 indicates that these respondents should be regarded as outliers.

Further analysis reveals that the employees group score on average 17.9, 17.4 and 14.9 (out of 20) on the personal value system in respectively the first, second, and third wave. Regarding the clients group these scores are about 16 in the first and second wave and 15.6 in the third wave. For the management, these scores are respectively 17.5, 17.2 and 16.6 for the first, second and third wave.

These results suggest that the personal value system was almost similar, compared to the SOCAV values, in the first and second waves, but decreased somewhat in the third wave. These results count for the clients group, the employees group and the management group.

Figure 2 shows how the team value systems evolve during the three waves for the employees, the clients, and management.

Figure 2: Distribution of the scores on the team value system per group for each wave.

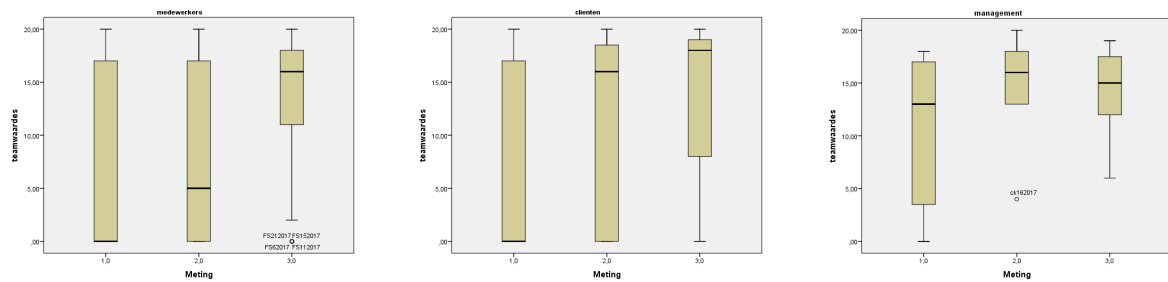
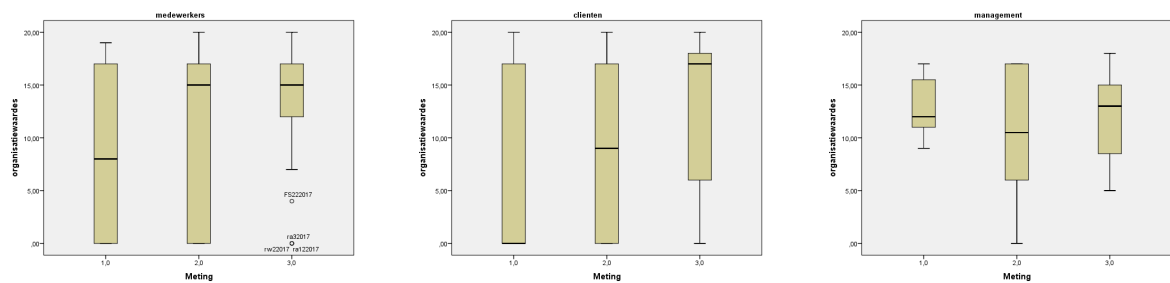


Figure 2 indicates that regarding the first wave about 63 employees, 44 clients, and 3 members of the managements score a 0. In the second wave less respondents score a zero: 17 employees, 15 clients, and 0 members of the management. In the third wave these numbers are decreased further: 3 employees, 6 clients, and none of the management score a zero. These results suggest that more and more individuals of all groups perceive the SOCAV values in working processes.

Further analysis shows that on average the employees group have a score of 7.3, 8.0, and 13.4 in the first, second and third wave respectively on the team value system. For the clients group, these averages are respectively 7.9, 10.4 and 13.3. And for members of management these averages are respectively 10.4, 14.5 and 14.3. These results suggest that the scores on the team value system for each group is moving towards the SOCAV values during the project. However, it should be noted that the scores for the management group do not change between the second and third wave.

Figure 3 presents the distributions for the organizational value system of each group across the waves. It turns out that during the first wave, 53 employees, 49 clients, and no members of the management score a zero on the organizational value system. In the second wave, these numbers have decreased for the employees and clients group (respectively 10 and 14). However, in the second wave one member of management scores a zero. In the third wave these numbers have decreased even further. Now 3 employees, 6 clients and no members of management score a zero. These results suggest that more and more individuals of the employees and clients group ascribe the SOCAV values to the organisation. This suggests that it is appreciated that the organization has adopted the values and reflects these in operational terms, according to the respondents in the three groups.

Figure 3: Distribution of the scores on the organisational value system for each group across the waves.



Further analyses reveals that employees have on average an 8.1, 11.6 and 14.0 on the organisational value system in the first, second and third wave respectively. For the clients group, these averages are 6.9, 9.2 and 12.5 respectively. And for management they are 12.8, 10.2 and 12.1. These results suggest that employees as well as clients ascribe more and more SOCAV values to the organisation. But management is more ambiguous: In the second wave they ascribe less SOCAV values to the organisation compared to the first and third wave.

Before testing the hypotheses that the values systems evolve toward the SOCAV values during the project, we will report the means and standard deviation for each group of respondents across waves. One should notice that the means may not reflect the central tendencies of the scores on the value systems since the number of respondents involved was relatively small and the boxplots suggest that the distribution of the scores on the value systems may not approach a normal distribution. Therefore, the median is also reported.

Regarding the employees, one can notice that at the start of the project, the central tendencies (mean and median) of the personal value system is quite similar to the SOCAV values (20 indicates the optimal similarity). During the project, the team value system and organisational value system of the employees move toward the SOCAV values. At the end of the project, the individual, team and organisational value systems are more similar than at the start of the project. This tendency is also supported by the median. The relatively large standard deviations of the team and organisational value system (and in the third wave the individual value system) of the employees suggest that employees differ in the values they assign to the team and the organisation (and to themselves in the third wave).

Table 4 Mean (standard deviation) and median of the difference value systems for each group across waves

	wave	Personal value system	Team value system	Organisational value system
Employees	1	17.8 (s.d. 1.57); 18	7.27 (s.d. 8.61); 0	8.06 (s.d. 8.09); 8
	2	17.4 (s.d. 1.85); 17.5	8.03 (s.d. 8.34); 5	11.63 (s.d. 7.43); 15
	3	14.85 (s.d. 6.49); 17	13.43 (s.d. 6.43); 16	14.05 (s.d. 4.78); 15
Clients	1	15.96 (s.d. 2.95); 17	7.88 (s.d. 8.56); 0	6.93 (s.d. 8.55); 0
	2	16.03 (s.d. 2.47); 16	10.37 (s.d. 8.94); 16	9.24 (s.d. 8.18); 9
	3	15.59 (s.d. 4.68); 17	13.34 (s.d. 7.56); 18	12.53 (s.d. 7.38); 17
Management	1	17.50 (s.d. 2.32); 18	10.45 (s.d. 7.47); 13	12.82 (s.d. 3.06); 12
	2	17.17 (s.d. 2.48); 17.5	14.50 (s.d. 5.79); 16	10.17 (s.d. 6.61); 10.5
	3	16.63 (s.d. 1.85); 17	14.27 (s.d. 3.98); 15	12.09 (s.d. 4.28); 13

The group of clients shows similar tendencies. At the start of the project the personal value system is already quite similar to the SOCAV values and seems to be stable during the project. The team and organisational value systems of the client group seems to develop towards the SOCAV values during the project. But the convergence between the personal, team and organisational values system seems not be as pronounced as in the case of the employees group. These trends are supported by the medians.

For the management group, the changes are less clear cut. This might be due to the small number of respondents of this group. At the start of the project the personal value system of management was already quite similar to the SOCAV values, as was the case for the employees and the clients. At the end of the project, the personal value system of management diverges more from the SOCAV values than at the start of the project. It is further noticed that the team value system of management moves towards the SOCAV values, during the first period of the implementation of the SOCAV program but consolidates during the third period. Regarding the organisational value system, the results suggest that there is a backlash between the first and second wave, but they recover to the starting level at the end of the project. These tendencies are supported by the median.

5.4 Do the value systems of the clients, employees and management converge during the project?

In this section the differences between the value systems of employees, clients and management is explored. A central thesis is that a care giving organisation is more effective if all people involved in the social process of care giving have the same value systems. It is tested whether the SOCAV values as a reference point are adopted for the personal, team and organisational value systems separately. We will further explore whether the values systems of the different groups involved get more similar during the project. It will be explored what differences emerge between the groups of people involved in the care giving process (in this study employees, clients and management) with regard to their (personal, team, or organisational) value systems, and simultaneously the difference between the waves will be examined as well.

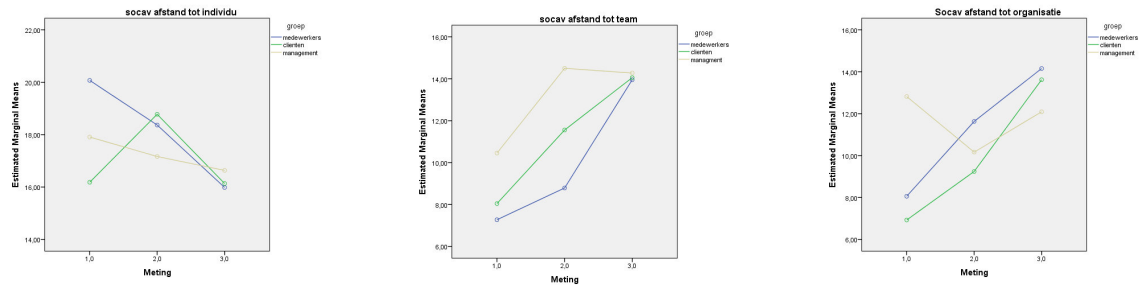
This analyses can be carried out by means of an analyses of variance with the value systems (personal, team or organisation) as the dependent variable, and the groups and waves as factors. The results of the testing (ANOVA) are shown in table 5.

Table 5 Testing the differences of the value systems between the groups and waves

	F-values		
	Personal values	Team values	Organisational values
Group	0.871 (p> 0.10)	1.90 (p>0.10)	1.51 (p> 0.10)
Wave	1.218 (p>0.10)	7.89 (p< 0.05)	5.37 (p< 0.05)
Group*Wave	1.788 (p=0.130)	0.54 (p>0.10)	1.36 (p>0.10)

The analyses indicate that the personal values do not differ significantly between the groups of respondents (clients, employees, management) and that during the project the personal values are more or less stable (no significant effect of the factor wave). However, figure 4 suggests that in the third wave the personal value systems of all groups are more similar to each other but are less similar to the SOCAV values than at the beginning of the project (the scores of the personal value system have slightly dropped (however, is effect is not significant).

Figure 4: Estimated scores per group and per measure based on ANOVA.



Regarding the team value system, Table 5 indicates no significant difference between the groups (so across the three wave, the group of clients, employees and management do not differ in their team value system). However, the team value systems do differ between the waves. Inspection reveals that the team value systems were lower (less conform SOCAV) in the first wave than in the second wave. Moreover, the employees and clients, have a higher score on the team value system in the third wave than the second wave. Due to the fact that for all groups the team value system evolves toward the SOCAV values, they converge towards the same value point as can be seen in figure 4.

For the organisational value system table 5 reports no significant difference between the groups. As for the team value system, the organisational value system changes over time (a significant effect of wave). Inspection reveals that for the employees and the clients the organisational value system evolves toward the SOCAV values. For the management, the organisational values were already quite high (quite similar to SOCAV values) at the start of the project, they drop during the second wave, rise again in the third wave and are then comparable with the organisational values systems of the employees and clients (see also figure 4).

An additional question is to what extent differences in the convergence of the value system can be attributed to background variables such as gender, age and duration of employment. Table 6 summarises the results of the Anova that took these variables also into account.

Regarding the different value systems, the results of these more extensive analyses are quite similar to those reported in table 5. Again, the personal value systems do not differ between the groups and it did not change during the project. For the team value systems, no differences between the groups is found, however this value system does change over time (significant effect of wave). The same counts for the organisational value systems: no difference between the groups and a significant differences between the waves.

Table 6 Testing the difference in values systems between groups, waves and the background variables age, gender and duration of employment

	F-values		
	Personal values	Team values	Organisational values
Group	0.52 (p>0.10)	0.91 (p>0.10)	0.46 (p>0.10)
Wave	1.33 (p>0.10)	7.67 (p< 0.01)	5.71 (p< 0.01)
Group*Wave	1.75 (p= 0.139)	0.66 (p>0.10)	1.40 (p>0.10)
Age	0.006 (p>0.10)	0.02 (p>0.10)	0.08 (p>0.10)
Duration of employment	0.004 (p>0.10)	0.94 (p>0.10)	6.38 (p= 0.01)
gender	0.572 (p>0.10)	1.36 (p>0.10)	3.87 (p=0.05)

When focussing on the background variables, it turns out that the personal and team values are not affected by these background variables, (age, gender and duration of employment are not significant). But 'gender' as well as 'duration of employment' do have an effect on the organisational value system. Additional analysis indicates that those who are longer employed score lower on the organisational value system. This suggests that duration of employment stagnates the acceptance of the SOCAV values. Furthermore, the effect of gender indicates that women score lower on the organisational value system. This suggests that women are less inclined to ascribing the SOCAV values to the organisation. More research is needed to explain this difference.

The results indicate that the background variable 'gender' and 'duration of employment' only have an effect on the organisational value systems although table 4 reports substantial standard deviations what indicates substantial differences in the value systems. This suggests that other background variables may affect the acceptance of new orientations of an organisation.

5.5 Does cultural entropy decrease during the project?

Cultural entropy is defined as the alignment of a personal value system and value systems that govern work processes in an organisation. In this research, there are two such value systems: the team and organisational value system. If all three value systems (personal, team and organisational) align to the SOCAV values in the third wave, one can state that the cultural entropy is low and therefore everyone involved in the care-giving processes accepted the SOCAV values. In order to study cultural entropy, there should be a comparison between the personal, team, and organisational value system and the individual value system.

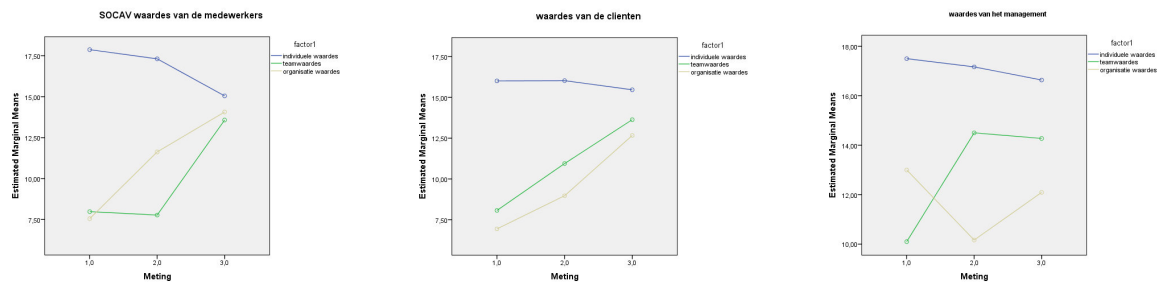
The differences between the three value systems should decrease during the project. This can be tested by means of a repeated MANOVA, in which the personal, team and organisational value systems are regarded as repeated measures of a value system. This application of repeated MANOVA may indeed be unconventional, but it is entirely in conformity with the line of reasoning that the difference between the personal, team and organisational value system of an individual in a specific point in time is an indicator of cultural entropy. These differences in value systems (of one individual) (within factor) is analysed for the different groups (employees, clients and management) (between factor) across time (between factor). This results in a 3x3x3 repeated measure MANOVA.

The results of the repeated MANOVA indicate that the groups (employees, clients and management) differ in their mean values across their value systems (the mean value of their personal, team and organizational value system) ($F(2,366) = 3.947, p=0.02$). And the value systems differ across waves ($F(2,366) = 11.420, p<0.01$). Furthermore, the personal, team and organisational value systems differ ($F(2,365) = 105.166, p<0.01$). Univariate within-subject contrasts of this factor indicates that the personal and team value systems differ ($F(1,366) = 86.701, p<0.01$) as well as the personal and organisational value systems ($F(1,366) = 81.230, p<0.01$). Hence, in general, cultural entropy can be recognized as an issue during the project. The question is, does the cultural entropy differ for the different groups and does it decrease during the project?

Analysis reveals that the groups do not differ in cultural entropy (the difference between the personal, team and organisational value systems) ($F(2,730) = 1.464, p>0.10$). But importantly, cultural entropy does change over time ($F(2,730) = 11.784, p<0.01$) as would have been predicted based on Barrett (2010, 2013). Univariate within-subject contrasts regarding this interaction (wave* cultural entropy) shows that the difference between the personal value systems and the team value systems decrease during the project ($F(2,366) = 10.476, p<0.01$), as well as the differences between the personal and organisational value systems ($F(2,366) = 6.961, p<0.01$).

Figure 6 shows the estimated values, which suggests that cultural entropy decreases faster for the employees and the clients than for the management. This (three way) interaction-effect is only marginally significant in the multivariate test ($F(2,730) = 1.765, p = 0.08$), and does not reach significance in any of the univariate within-subject contrasts.

Figure 6: estimated values for groups of respondents



5.6 Triangulation

Through a qualitative data collection and analysis (interviews, focus group and observations) the outcome of the quantitative measurement was triangulated. The first analysis of the qualitative data supports and further details the quantitative analysis (Landa, 2018) with more detailed analysis to be presented (Landa, 2019).

Chapter 6. Conclusions

In this paper the concept of 'cultural entropy' is conceptualized, operationalized, and tested. Cultural entropy is the dispersion of values within an organisation between self and values ascribed to the organisation. A high level of cultural entropy is associated with inefficiency in work implementation processes.

Based on analysis of the concept of 'cultural entropy', a scale was developed to assess organisational transformation: the Monitoring Organisational Change by Values-scale. In order to use the scale a reference point of values should be established. This paper sets out the theoretical underpinning of the scale as well as a methodological procedure to monitor cultural entropy.

In order to validate the scale it was tested in a real-life research of organisational transformation. The direction of the change was established by an ideal set of values based on an assessor's definition of the approach chosen for organisational transformation: SOCAV. Social Entropy was measured as the difference between the values of the assessor's list ascribed by respondents to the organisation and the self.

The results of the research showed that cultural entropy could be demonstrated and that the SOCAV approach introduced in an elderly care organisation diminished the level of cultural entropy. An increased organisational adherence to the ideal set of values was shown, in the direction desired by the programme. These findings were positively triangulated in a qualitative data collection and analysis and respondents reported increased uptake of SOCAV values by self, team and by organisation. Respondents also reported greater sense of satisfaction and organisational sense of purpose. These findings confirm the hypothesis that cultural entropy is associated with perceived sense of organisational effectiveness (Barett, 2010).

The conclusions of the qualitative analysis convincingly confirmed the internal validity of the Monitoring Organizational Change by Values-Scale.

This research provides a tested underpinning of the concept of cultural entropy, and that coherence of values within an organisation between self and the organisation are associated with perceived sense of organisational purpose and effectiveness.

Finally, this research demonstrates that effect of organisational transformation can be measured by the Monitoring Organizational Change by Value- Scale, based on the concept of 'cultural entropy'.

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