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Dobbelstein, Thomas; Krumm, Rainer

Article

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Journal of Applied Leadership and Management

Provided in Cooperation with:
Professional School of Business & Technology, Hochschule Kempten - University of Applied Sciences

Suggested Citation: Dobbelstein, Thomas; Krumm, Rainer (2016) : 9 Levels for Value Systems - Operationalising and measuring the level resistances, Journal of Applied Leadership and Management, ISSN 2194-9522, Hochschule Kempten - University of Applied Sciences, Professional School of Business & Technology, Kempten, Vol. 4, pp. 107-121, http://www.journal-alm.org/article/view/17098

This Version is available at:
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9 Levels for Value Systems

Operationalising and measuring the level resistances

Thomas Dobbelstein,
Duale Hochschule Ravensburg, Germany
Rainer Krumm

Summary

Research Question: How can personal resistances to values within the meaning of the 9 Levels for value systems be reliably measured?

Methods: The empirical operationalisation follows the classical scale development process. First the value level dimensions of the 9 Levels for value systems are formulated. 4 to 5 statements are formulated per dimension and assessed by 444 test subjects. Subsequently the statements are selected on the basis of their discrimination capacity. In connection with the evaluation of objectivity, reliability, and validity, 3 statements are selected per value level as items of the final scale.

Results: Overall a reliable resistance scale has been developed. The only exception is the operationalisation of one value level (purple), which exhibits slight limitations in discrimination capacity, reliability, expert-based content validity, and criterion validity.

Structure of the Article: 1. Initial situation, objective, and study design; 2. Foundations of the 9 Levels for value systems; 3. Resistances to a level; 4. Operationalisation of level-specific resistances; 5. Items of the resistance scale; 6. Critical reflection and continuous scale optimisation; 7. About the authors; 8. References

1. Initial Situation, Objective, and Study Design

The 9 Levels for value system is a values meta model, which inter alia allocates people to value categories within the model terminology of (values) levels (Dobbelstein and Krumm, 2012). However, in addition to belonging to a value level, people may also exhibit dislikes and resistances to a value level or against its specific value characteristics. The aim of the analysis is to develop tools for measuring personal resistances to individual value levels.

After a presentation of the 9 Levels for value systems, we will deal in-depth with the understanding of resistances within the approach. The central section involves the development of a scale for measuring resistance, i.e. which resistances a person may have to a certain level in the system. Besides the general methodology, the process will also be elucidated on a values level. The conclusion presents the quality evaluation along with an overview of the development scale.

2. Foundations of the 9 Levels for Value Systems

The 9 Levels for value systems model presents the development of value systems in individuals, groups, and organisations. It enables us to reach a better understanding, and in particular highlights some areas where change is required.

Values are constitutive elements of the culture, defining meaning and significance within a social system (group, company, etc.). Many models draw on individuals' behaviour patterns or fixed typologies. The 9 Levels model goes deeper; it determines the values. A culturally mediated value serves as a "guideline" for an individual, helping him to understand and recognise the world, and as a result becomes a premise for planning behaviour. The basic and action-oriented values are analysed and determined. They guide the manner in which people, departments, and organisations think and behave. They shape corporate cultures, drive people forward, give directions, provide the foundation for assessments, define what is right and what is wrong, and, depending on the degree of fulfilment, contribute to feelings of happiness and success.

The 9 Levels model is based on the findings of Clare W. Graves. Clare W. Graves (1914 - 1986) was a Professor of Psychology at Union College in New York (USA). The Gravesian theory is an open values theory model, based on a biopsychosocial system.

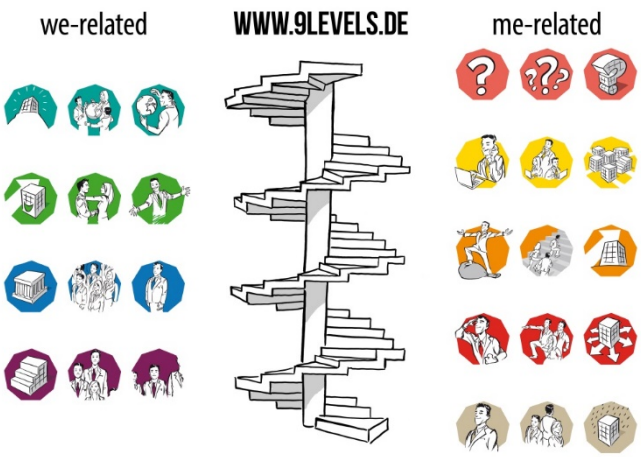
The 9 Levels and the value systems theory present the dynamic that is responsible for the development of individuals, groups, and organisations. Value systems, sometimes also called psychological DNA, express mindsets, doctrines, inner feelings, and organisational principles. With the 9 Levels these become measurable - and therefore changeable.

The 9 Levels for value systems can be applied to the individual, group, and organisational analysis levels. Furthermore either the current actual status or the desired target status of a person, group, or organisation can be examined.

The world is not static, and it is exactly the value systems that are subject to development. As the case may be, when a person is affected by influences from outside or from inside, the more he will seek to change the value systems, or the more they will shift. The world is changing, thus making adjustment of people and systems a necessity. Naturally people and systems in interaction also in turn change the environment/world. Therefore Graves analyses the interaction between the world and reactions. The world and reactions mutually condition each other. The world changes people and people change the world. These interrelationships are designated as coping mechanisms.

Figure 1:

Overview of the 9 Levels of the 9 Levels for value systems (www.9levels.de)



For a detailed description of each specific level see Dobbelstein, T., Krumm, R. 2012 or Krumm, R. 2016).

3. Resistances to a Level

As a basis for measuring resistances we will first define what is meant by resistance in the sense of the 9 Levels for value systems theory.

Resistance in the sense a psychological construct can be understood as a counter-effect, which experiences a will, an action, a force or a motion via an-other. To a degree this construct remains non-specific, and in a business con-text is defined as a "multi-faced phenomenon" due to its consequences, such as unanticipated delays, costs, and instabilities in the process of a strategic change (Przeworski, 2012).

As a central element of psychoanalysis, resistance ranges from the collective conscious struggle of groups around present life circumstances and forms, and the conflicts of employee groups given changes in organisational structures, to an individual form of resistance. In the management context it can function as a negative reaction to changes, such as is seen in structures, processes, or whole systems (Pühl, 2009). Resistances occur particularly when break-up of familiar structures or process flows is met with oppositional behaviour on behalf of individual employees. Changes set the persons affected into emotional tur-moil, and they are initially viewed as unwelcome (Przeworski, 2012; Illig, 2015). Resistance is experienced with the consequences of an action that restricts freedom, with the aim of restoring one's own freedom to act. The intensity of the resistance depends inter alia on the subjective importance attributed to the restriction by the resistor, the extent of the perceived restriction, and personal willingness to enact resistance (Loebbert, 2015).

Resistance can also be regarded as a protective function, which individuals, teams, and organisations develop to protect themselves from excessive demands and seemingly nonsensical or detrimental changes. Resistance may also be desirable in the context of a change process, in that stakeholders are signalling interest and concern. It also serves as a source of information for man-agers, as they will receive information on the needs of stakeholders (Grolmann, 2016).

The manifestations of resistance can be distinguished into open and hidden resistance (Wagner, 2016). Open resistance is consciously exerted by people, and is motivated by the effort to reach a constructive goal. The person exerting it also ensures that the resistance is perceived as such, and that he himself is attributed as relatively powerful. This is based on rational causes, whereby all stakeholders have an interest in a solution for overcoming them. Unlike this form of resistance, hidden or latent resistance is generally based on destruc-tive motivations. The persons exerting it act in secret, i.e. they have no interest in being recognised for it, or lack of awareness that they are enacting re-sistance. This form can be expressed by e.g. listlessness at work, silence de-

spite the requirement of communication, repeated questioning of decisions al-ready taken, demands for perfect solutions, or feigning ignorance.

The main tasks in the change process include incorporating resistances into the change process via appropriate measures. The aim is to divert resistances from individuals, departments, or the entire company into productive channels, and to employ appropriate techniques for conflict resolution. However, too little resistance can also mean that employees have an indifferent attitude in the company. In this instance resistances should be encouraged by uncovering hidden conflicts, leading to revival of an organisational unit (Zülsdorf, 2008).

With the 9 Levels for value systems resistances directed toward values are the main focus. Resistances to values systems or to value levels are characterised by the fact that the person who has this resistance does not agree with the values and the manner of thinking and behaviour derived from them. On the contrary, there is a backlash. This may assume various dimensions and intensities depending on the particular preferred value level. Resistances are under-stood to be the active or passive rejection of value levels (Graves, 1974; Graves, Madden and Madden, 1970). A person derives value systems from his actions, thoughts, and feelings. They guide his thoughts and indicate what is good and not good, approved or not approved.

Each level can also elicit resistances. This can have varying reasons. On the one hand the person concerned may have only a slight development of the level, and therefore these value systems are strange, or the person may have had negative experiences with this value system, giving rise to resistances. It is also possible that the value systems are in opposition to one's own value systems.

Examples:

- If a person has green as the main emphasis and prefers co-operative and consensual agreements, a red value system that prefers rapid and situational decisions (in case of doubt, without agreement) may give rise to resistance.

- If the main emphasis is purple and if rituals and traditions are adhered to, this will often give rise to resistance from orange, because from their point of view these people are obstacles to progress/growth.

This adverse effect often arises for levels which are opposite and have two levels in between, such as purple / orange, red / green, or blue / yellow.

The model pursues the idea that people can develop their values accordingly if their value levels coincide with those of the environment. Then the person will be healthy and can be successful. On the one hand the person, group, or organisation should be aware of his/their own value systems, on the other hand it should be clear against which level rejections and/or resistances apply.

The measurement of these resistances is important because it is precisely here that everyday problems arise. When people feel uncomfortable, tensions will arise in groups, and conflicts in organisations (Brandt-Biesler and Krumm, 2015).

4. Operationalisation of Level-Specific Resistances

The following presents the basic method of scale development, and discusses conformance with the quality criteria that are common in the research.

4.1.1 Scale development

In accordance with the basic orientation of the 9 Levels for value systems, development of the scale focuses on the value system's affective emotional component. Based on the Likert scaling method (Berekoven, Eckert and Ellenrieder 2009; lacobucci and Churchill 2015; Nieschlag, Dichtl and Hörschgen, 2002; Swain, Weathers and Niedrich, 2008), preparation of the scale is in accordance with the following steps:

1. Formulating statements on relevant resistance dimensions
2. Rating of the statements by the target group and calculating level-specific resistance values
3. Selection of items based on their discrimination capacity
4. Measuring level resistances using the selected items
5. Testing the scale quality

4.1.2 Formulating statements on relevant resistance dimensions

Each level is defined via 4 to 5 dimensions. For the red level these are e.g. personal success, power, aggression, strength, and assertiveness. Between 4 and 5 statements are formulated for each dimension. In total there are between 25 and 28 statements per level. These have the following properties in the context of scale development:

1. Each statement corresponds to a resistance to the respective dimension reflected in a verbal expression. For the same parts each statement allows for expressing a positive attitude and a negative attitude, which is verbally indicated using the scale endpoints of "does not apply at all" to "completely applies". The centre of the 5-point scale represents a neutral area.

2. The statements are formulated by experts in the 9 Levels for value systems theory. In this respect the aim is to ensure that the statements a priori describe either a very positive or a very negative attitude, a very large or a very small resistance to the respective level dimension. It should also be noted that the statements represent independent expressions of resistance, and do not just consist of the negative expression of the statement in measuring affiliation with a level (Dobbelstein and Krumm, 2012).
3. Each item has a monotonic response characteristic, that is, the more positive the attitude of a respondent is to that dimension of the attitude object, the higher the likelihood of receiving an affirmative statement. Conversely, this also applies to a negative attitude or negative response (Iacobucci and Churchill, 2015; Jäpel, 1985; Nieschlag, Dichtl and Hörschgen, 2002). In the present case this is conveyed in that the higher the resistance, the higher the likelihood of receiving an affirmative statement and vice versa.
4. The numerical values assigned to the attitude expressions correspond to a directed psychological attitude continuum (DeVellis, 2012; Iacobucci and Churchill, 2015; Nieschlag, Dichtl and Hörschgen 2002). In the specific case of resistance measurement, the statements are formulated such that a high value (5) expresses a strong resistance to the respective level dimension, and a low value (1) expresses a low resistance.

Figure 6 (see below) presents an overview of all dimensions and formulated statements as an example for the blue level.

4.1.3 Rating of the statements by the target group and calculating level-specific resistance values

In order to choose the most selective criteria for the first development of the 9 Levels for value systems resistance scale, 444 test subjects based on a convenience sample answer the compiled item battery - in accordance with plausibility checks. The survey is carried out online. Both question sets per level and the questions within a set are randomised. Figure 2 to Figure 5 show the composition of the initial sample on the basis of the applicable percentage.

Figure 2:

Distribution of the gender criterion in the sample

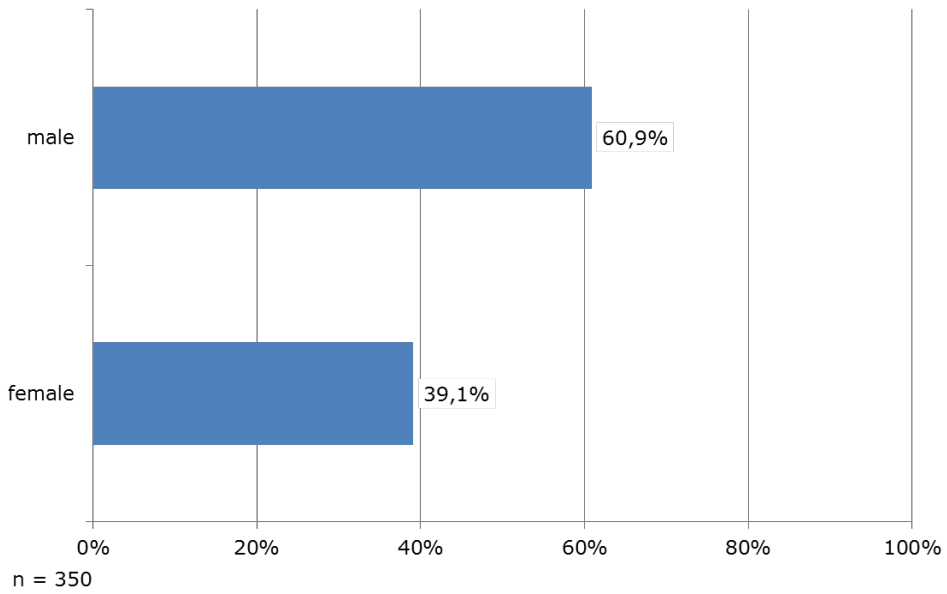


Figure 3:

Distribution of the age criterion in the sample

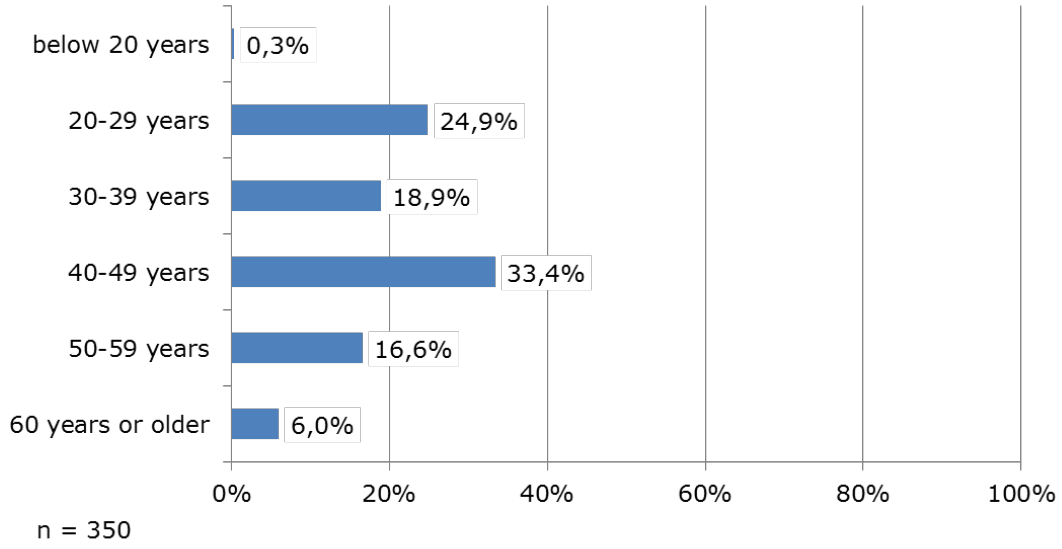


Figure 4:

Distribution of the professional position criterion in the sample

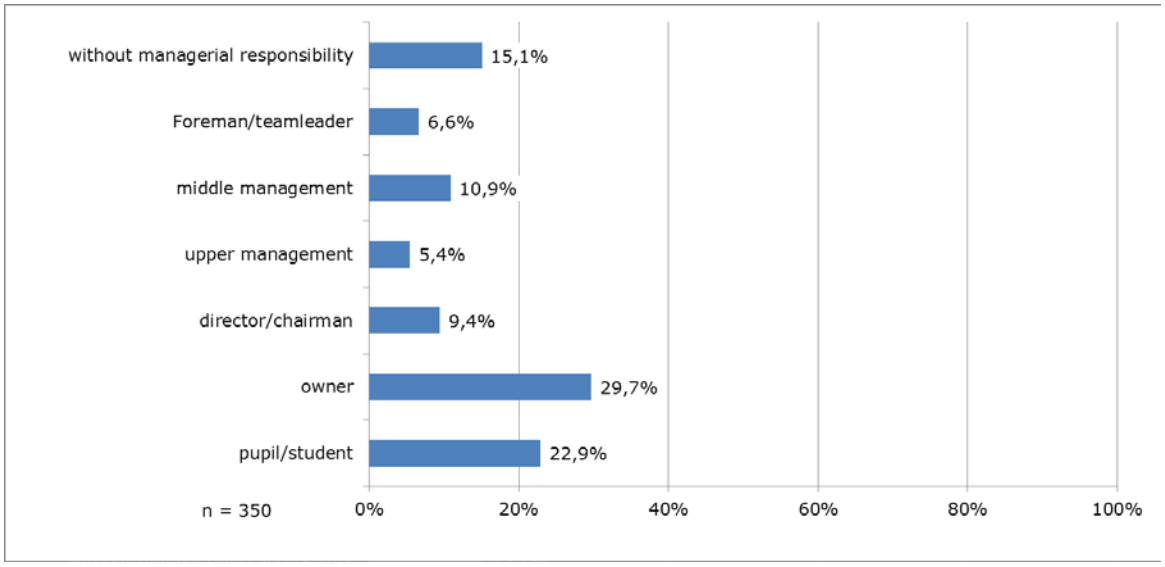
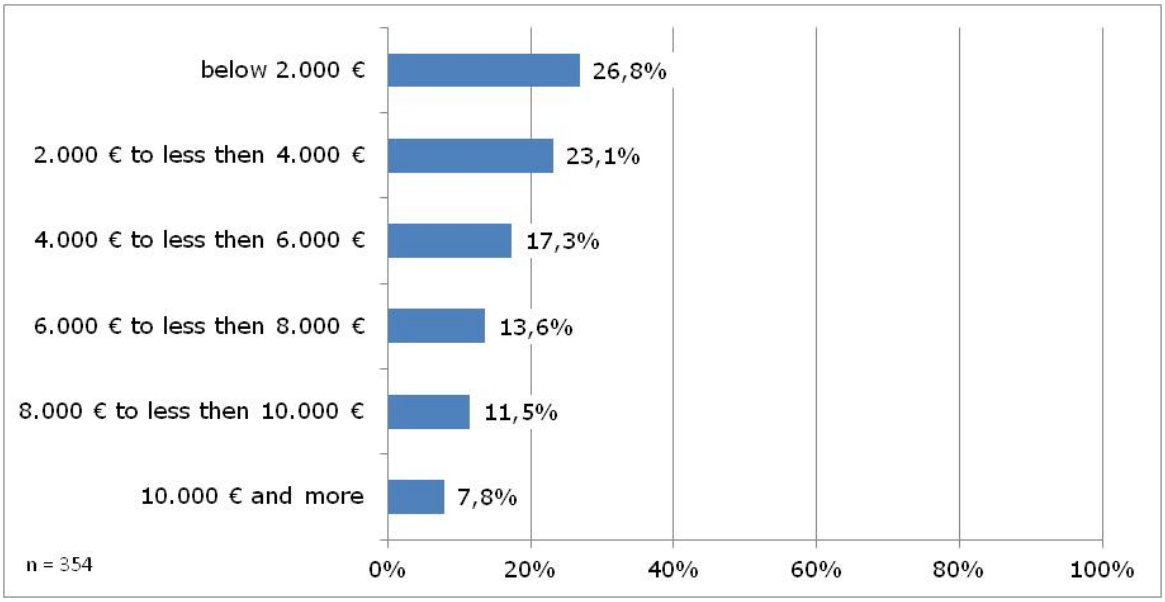


Figure 5:

Distribution of the income criterion in the sample



We calculated the respective resistance value analogously to the main scale attitude value as the average of individual statement values (In the original Likert scale the attitude value, analogous here to resistance as a form of attitude, is calculated as the sum of attitude values. Since with the 9 Levels for value systems the resistance values are to be calculated for each level and in the design phase exhibit a different number of statements, the average - to ensure comparability - is used instead of the sum to calculate the level-specific resistance value.). However, not all statements are entered into the resistance value calculation, but only those which possess the best discrimination capacity for each level.

4.1.4 Selection of items based on their discrimination capacity

The central point of scale construction is the selection of statements to be included in the final level resistance scales (Iacobucci and Churchill, 2015; Jäpel, 1985; Nieschlag, Dichtl and Hörschgen, 2002). The final level resistance scales must on the one hand be capable of being interpreted as expressions of the individual attitude continuum, and on the other hand they must discriminate well between the resistances to each level. This means that a respondent, who e.g. affirms a statement expressing resistance to a level, also exhibits a greater degree of resistance to this level than a person who rejects the respective statement against a level.

The central decision criterion for inclusion of a statement in the final level resistance scale is its capacity to discriminate. This is determined by the respondents being classified in accordance with their resistance values - calculated as described above. The 25% of respondents with the highest scale values yield the upper extreme group, i.e. those with the highest resistances. The 25% with the lowest scale values yield the lower extreme group, i.e. those with the least resistances to the respective level. In the next step the mean value of all respondents is separately calculated for each of the upper and lower extreme groups. The difference between the mean value of the upper and lower extreme groups for each statement is an expression of how well a statement can distinguish between a positive and negative attitude, in the specific case between a high and low resistance to a level, i.e. the measure of a statement's capacity to discriminate. The statements with the greatest discrimination capacity are selected for the final scale. As determined by use in practice of the scale to be developed, the number of statements is set to 3. If 2 statements exhibit a similar capacity to discriminate in considering their mean differences, the variance is included as an additional criterion. Criteria which have a higher homogeneity of responses within the respective extreme group with the same mean difference, are better suited for the final scale. In this case respondents with extreme opinions show a high consensus regarding evaluation of this criterion, indicating clearer answerability, higher semantic clarity of a statement, and clearer discrimination capacity.

The described conventional Likert scaling procedures provide a ranking of the items in accordance with their selectivity. Figure 6 provides an example of this for the blue level.

Figure 6:

Discrimination capacity of blue level items

Level	Dimension	Question	lower 25 %		upper 25 %		Difference between upper and lower extrem group	the sample	
			mean	standard deviation	mean	standard deviation		mean	standard deviation
Blue	loyalty	I don't like it when loyalty stands above everything else.	2,17	0,892	4,39	0,748	**2,22**	3,31	1,231
Blue	order	Too much order bothers me.	1,84	0,708	3,95	1,042	**2,11**	2,84	1,227
Blue	loyalty	If people are always loyal with no ifs or buts, that bothers me.	2,41	1,031	4,48	0,784	**2,07**	3,41	1,259
Blue	order	I don't like it when order is put above everything else.	2,59	0,969	4,66	0,558	**2,07**	3,62	1,128
Blue	Compliance with rules	I don't like always having to bow to the rules.	2,59	1,003	4,66	0,518	**2,07**	3,75	1,096
Blue	Compliance with rules	I don't like this compliance with rules.	2,31	0,880	4,31	0,748	**2,00**	3,29	1,128
Blue	order	When people only do things for the sake of order, I don't like that.	2,67	0,962	4,61	0,605	**1,94**	3,68	1,097
Blue	Law & Justice	I don't like it when someone is constantly hiding behind rules and regulations.	2,90	1,017	4,83	0,404	**1,93**	3,96	1,069
Blue	Law & Justice	Rules and regulations should not dominate everything.	2,40	0,915	4,31	0,831	**1,91**	3,39	1,156
Blue	loyalty	It bothers me when people are always loyal.	2,00	0,939	3,90	1,098	**1,90**	2,87	1,247
Blue	order	It bothers me when maintaining order becomes an end goal in itself.	2,77	0,957	4,65	0,729	**1,88**	3,75	1,137
Blue	Law & Justice	I don't like it when someone adheres to rules and regulations too strictly.	2,13	0,953	3,99	0,922	**1,86**	2,96	1,172
Blue	Law & Justice	It annoys me when people always pay attention to rules and regulations.	2,03	0,890	3,82	1,148	**1,79**	2,83	1,191
Blue	Loyalität	Loyalty must have limits.	2,68	1,153	4,47	0,743	**1,79**	3,57	1,211
Blue	Law & Justice	When rules and regulations are implemented blindly, I don't like it.	3,11	1,121	4,88	0,332	**1,77**	4,10	1,035
Blue	order	Order should not always take centre stage.	2,61	0,956	4,31	0,888	**1,70**	3,57	1,050
Blue	Compliance with rules	I don't like blind compliance with rules.	3,27	1,162	4,91	0,327	**1,64**	4,30	0,980
Blue	Compliance with rules	It bothers me when someone adheres to an existing rule, against their better judgement.	2,99	1,073	4,61	0,789	**1,62**	3,96	1,069
Blue	guilt and innocence	I don't like it when people always classify everything as right or wrong.	3,18	1,113	4,76	0,522	**1,58**	4,09	0,958
Blue	loyalty	I don't like it when hierarchy beats everything else.	3,27	1,159	4,82	0,528	**1,55**	4,20	0,984
Blue	guilt and innocence	I don't like it when people always immediately talk about guilt and innocence.	3,27	1,089	4,77	0,592	**1,50**	4,12	0,997
Blue	guilt and innocence	It bothers me when someone always has to evaluate everything.	3,16	1,139	4,61	0,591	**1,45**	3,89	1,063
Blue	Compliance with rules	I don't like it when there's doubt about the meaning of the rules.	3,46	1,104	4,89	0,341	**1,43**	4,28	0,960
Blue	guilt and innocence	You shouldn't think in categories of just guilt and innocence.	3,59	1,163	4,85	0,528	**1,26**	4,31	0,951
Blue	guilt and innocence	I don't like it when people think in black and white categories.	3,55	1,206	4,80	0,615	**1,25**	4,28	0,973

It is apparent that among the ten most selective criteria there are several criteria that pertain to the same dimension. Thus three criteria describe the dimensions of "Loyalty" and "Order", and two describe the dimensions of "Compliance with rules" and "Law and order". It is questionable whether it is effective to use all selective statements for a dimension in the final questionnaire. If two or more criteria indicate very similar results in terms of multi-collinearity, it is not effective to use all of the criteria in the final questionnaire. This is because variables with a high degree of correlation on the one hand yield similar results, i.e. do not improve the measurement of a person's resistance to a level, and on the other hand they lengthen the questionnaire. Therefore it is not efficient to include them in the final scale.

Thus for scale optimisation in this sense the Pearson's correlation coefficients are calculated for the statements of a level, if among the statements identified as relevant for the final scale there are several which pertain to the identical dimension for a level. If a correlation coefficient greater than 0.5 is calculated for these, the least selective item for the respective dimension is not included in the final scale. Accordingly the item moves up in the final scale to another dimension with the next higher discrimination capacity. In the following example Figure 7 and Figure 8 show the correlation coefficients for the three blue level items with the most discrimination capacity

Figure 7:

Pearson's correlation coefficient for the three items in the "Loyalty" dimension with the highest discrimination capacity

		I don't like it when loyalty stands above everything else.	If people are always loyal with no ifs or buts, that bothers me.	It bothers me when people are always loyal.
I don't like it when loyalty stands above everything else.	Correlation according to Pearson	1	,533**	,587**
	significance (bilateral)		0	0
	N	373	372	371
If people are always loyal with no ifs or buts, that bothers me.	Correlation according to Pearson	,533**	1	,619**
	significance (bilateral)	0		0
	N	372	375	372
It bothers me when people are always loyal.	Correlation according to Pearson	,587**	,619**	1
	significance (bilateral)	0	0	
	N	371	372	373

** the correlation is on the level of 0,01 (bilateral) significant.

Figure 8:

Pearson's correlation coefficient for the three items in the "Order" dimension with the highest discrimination capacity

		Too much order bothers me.	I don't like it when order is put above everything else.	When people only do things for the sake of order, I don't like that.
Too much order bothers me.	Correlation according to Pearson	1	,556**	,460**
	significance (bilateral)		0	0
	N	372	371	368
I don't like it when order is put above everything else.	Correlation according to Pearson	,556**	1	,560**
	significance (bilateral)	0		0
	N	371	374	370
When people only do things for the sake of order, I don't like that.	Correlation according to Pearson	,460**	,560**	1
	significance (bilateral)	0	0	
	N	368	370	373

** the correlation is on the level of 0,01 (bilateral) significant.

The selection criteria for the resistance scale are derived as follows for the blue level (for the corresponding values compare Figure 6, Figure 7, and Figure 8):

Firstly the two items with the highest discrimination capacity, "I do not like it when loyalty is placed above everything" (2.22 - "Loyalty" dimension) and "Too much order bothers me" (2:11 "Order" dimension) are included. The items placed next in the discrimination capacity ranking are "It bothers me when people are always unquestioningly loyal" (2.07 - "Loyalty" dimension) and "I do not like it when order is placed above everything" (2.07 - "Order" dimension). Since both pertain to dimensions already present in the scale, the correlation is checked with the already included statements. A highly significant correlation of 0.533 is indicated by the two loyalty items (Figure 7), and for the two criteria in the "Order" dimension there is a highly significant correlation of 0.556 (Figure 8). Therefore they are removed from the scale. Accordingly the next selective item, "I do not like always complying with the rules", (2.07), is moved up, which pertains to the dimension, "Compliance with rules". This way the criteria with the most discriminating capacity for the blue level are determined. The selection criteria for the resistance scale are derived as follows for the blue level (for the corresponding values compare Figure 6, Figure 7, and Figure 8):

Firstly the two items with the highest discrimination capacity, "I do not like it when loyalty is placed above everything" (2.22 - "Loyalty" dimension) and "Too much order bothers me" (2:11 "Order" dimension) are included. The items placed next in the discrimination capacity ranking are "It bothers me when people are always unquestioningly loyal" (2.07 - "Loyalty" dimension) and "I do not like it when order is placed above everything" (2.07 - "Order" dimension). Since both pertain to dimensions already present in the scale, the correlation is checked with the already included statements. A highly significant correlation of 0.533 is indicated by the two loyalty items (Figure 7), and for the two criteria in the "Order" dimension there is a highly significant correlation of 0.556 (Figure 8). Therefore they are removed from the scale. Accordingly the next selective item, "I do not like always complying with the rules", (2.07), is moved up, which pertains to the dimension, "Compliance with rules". This way the criteria with the most discriminating capacity for the blue level are determined.

There are no exact figures on the number of selected items for the scale (Berekoven, Eckert and Ellenrieder, 2009; Iacobucci and Churchill, 2015). To ensure the selectivity and thus the best possible resistance measurement, in this case a difference between the mean values of ideally 50% of the scale range is required, thus at least 2. Furthermore the number of items per level should not be too large, and be uniform in terms of pragmatic implementation. If these criteria are applied in combination with the above selection mechanism to the items of each level, this yields 3 statements each for the levels turquoise, green, orange, and blue. For yellow ("Inspiration" dimension) and red ("Personal success" and "Power" dimensions), due to the high correlation of individual items within a dimension, for each third item the discrimination limit value falls short by 2. The total lowest discrimination capacity is indicated for the purple level, for which the item with the highest discrimination capacity only has a difference value of 1.72. One possible reason for this is the general rejection of this level's values in the sample. For difference values of the final scale see Figure 12.

The final resistance scale per level and for the entire 9 Levels for value systems is selective for the criteria, as resulting from the described method, and can be found in section 5 with the respective difference values.

4.1.5 Measuring resistance using the selected items

Measuring level resistance with the final scale proceeds using the 3 items per level as selected via the described method. Since a uniform number of statements is used per level, it is no longer necessary to include an average as a measure of level affiliation, and the original sum method can be returned to.

The 5-pole scale used for scale development indicates an unsatisfactory differentiation of respondents in some places. Therefore in order to encourage differentiation the final instrument uses a scale of 0 "does not apply at all" to 10 "completely applies". Except for the lower scale intervals, all the necessary properties of the Likert scale are maintained in order to encourage attainment of a higher differentiation capacity, especially the two expressions of positive and negative attitudes, possible for both parts, along with the possibility of a neutral expression of opinion.

Since 3 statements per level are used for measurement, resistance values between 0 and 30 points can be achieved per level. For improved comparability, in practical application of this scale these resistance point values are transferred into a percentage scale analogous to the level affiliation scale. In accordance with the 9 Levels for value systems theory, the resistance percentages are not 100% complementary with those of level affiliation, but it is quite possible that a person will exhibit high resistance against several levels (Dobbelstein and Krumm, 2012). The subsequent testing of scale quality is of great importance. Thus it will be dealt with separately in the next section 4.2.

4.1.6 Quality testing of the resistance scale

The following sections deal with the quality criteria that are normative for scale development, those of objectivity, reliability, and validity.

4.1.7 Objectivity

Objectivity consists of implementation, evaluation, and interpretation objectivity (Schumann, 2011).

Implementation objectivity is present when the results of measurement are independent of the implementing persons. The survey regarding resistances to the 9 Levels for value system is conducted online using the developed scale. Thus no element is present which influences implementation objectivity.

Similarly, **evaluation objectivity** requires independence of the evaluation from the person who is implementing it, i.e. different people must receive identical (numerical) results given identical answers. The 9 Levels for value systems resistance scales exclusively use closed questions, and provide a unique formula for calculating level-specific resistance values. Thus factors that limit evaluation objectivity are not present.

Interpretation objectivity requires that different researchers do not derive differing substantive conclusions on the basis of a specific numerical result. Due to the level-specific resistance value, the extent of resistance to a level is clearly present without the possibility of the researcher's subjective interpretation. Thus the resistance scale meets the requirement of interpretation objectivity.

The interpretation of the relationship of different level resistances to each other and the conclusions derived from it is outside the scope of the task discussed here, that of resistance scaling, and so is not part of the objectivity discussion. The described interpretations, which are apart from the resistance scale, are based on the numerical results of the scale, and deliberately reflect the subjective experiences of the implementing person.

Therefore in summary the three primary objectivity demands for the discussed 9 Levels for value systems resistance scales may be regarded as fulfilled.

4.1.8 **Reliability**

A scaling procedure is deemed reliable if it yields accurate measurement values (Berekoven, Eckert and Ellenrieder 2009; DeVellis, 2012; Nieschlag, Dichtl and Hörschgen, 2002; Schumann 2011). By exact is meant accuracy in the sense of the reproducibility of measured values given repeated measurement of the same property for the same attribute holders. A high correlation of these measurement values is a significant indicator of scaling procedure quality. Since the criterion of stability, which is based on measurements of the same group subjects at different times (retest reliability), can only be applied with difficulty in practice, both in general and for the present 9 Levels for value systems resistance scale, the further versions focus on the degree of internal consistency.

A scale is considered to be consistent if two parallel measurements yield equal readings. A common method to obtain two sets of measurements is to divide the items of a scale into two parts and to calculate separate scale values for both sub-samples. A common measure of this internal consistency of a scale is Cronbach's α. In this regard it is assumed that the items used in the context of a scaling method are highly correlated with each other, because they all measure the identical construct. The resistance to each level is measured separately in the context of the scale development for the 9 Levels for value systems resistance scale. This means that Cronbach's α is to be individually calculated for each level, i.e. via all statements and respondents for each level. Every possible combination of the individual items is taken into account for the totality of all items within each level, and split into two halves, i.e. the correlation of all items or the average correlation of all items for a level is used as a basis. Cronbach's α is defined per level as follows:

$$\alpha = \frac{k\overline{r}}{1 + (k-1)\overline{r}}$$

where

k = number of items per level

$\overline{r}$ = the average correlation of all items for a level

The difference to the Pearson correlation coefficient in the context of the above scale construction is that Cronbach's α measures the correlations between all statements for a level contained in the scale. However, in the context of scale construction the aim is identifying redundant statements within a dimension of a level - in dependence upon the redundancy indicated by this partial correlation - and to eliminate them from the final scale.

Cronbach's α can accept values between 0 and 1. (DeVellis, 2012). Values above 0.7 are considered satisfactory, above 0.8 good, and above 0.9 excellent. The following values result from the seven resistance scales:

Figure 9:

Cronbach's α for the level-specific resistance scales

Level	Cronbachs α
Purple	0,482
Red	0,711
Blue	0,729
Orange	0,777
Green	0,735
Yellow	0,755
Turquoise	0,678

Except for level purple all reliability values are satisfactory. The low value of Cronbach's α for the purple level resistance scale corresponds with the small mean value differences between the upper and lower extreme groups within the item selection in comparison with the other levels, and thus is hardly surprising.

4.1.9 **Validity**

The validity quality criterion analyses to what extent a scaling method actually measures what it intends to measure (Nieschlag, Dichtl and Hörschgen, 2002; Schumann, 2011). Therefore a scale is valid to the extent that the measured values correspond with the real characteristic values. Since scalings generally, as in the present case, refer to hypothetical constructs that are not directly observable, validity is usually analysed indirectly via indicators and various validity concepts. These are content, criterion, and construct validity.

Content validity is not an empirically testable form of validity, but describes the existing reliability in accordance with appearances (face validity). For the 9 levels for value systems resistance scale it refers to how well the individual items of a level represent the resistance to a level. Expert ratings are the common instrument used for measurement. If more than one expert independently agrees that the present level scales are valid in this sense, then the level scales and thus the total measurement is assigned content validity.

In the present case, this assumes a detailed knowledge of the individual level characteristics of the 9 Levels for value systems approach and the perceived resistance to them. Since this is a new approach, although derived

from the Graves value system (Bear, Krumm and Wiehle, 2010; Beck and Cowan, 1996), it is not possible at the current time for it to be evaluated by several independent experts who have not been involved in development of the 9 Levels for value systems approach. Alternatively experts have been asked to evaluate the developed resistance scale who already work with the approach, but who have not been involved in development of the resistance scale (Markus Brand, Managing Director of the Institut für Persönlichkeit - Christian Albat, Albatrosse Beratung - Prof. Thomas Ginter, Institut für Wertezentriertes Management - Peter Krötenherdt, Vice President BDVT e.V. - Gianni Liscia, Managing Director of Liscia Consulting). In general the experts have come to the conclusion that the selected items suitably express the resistance to central dimensions of the respective levels. A criticism is that the scale does not include all the dimensions of a level, and that each dimension is only measured with one item. It has furthermore been remarked that for the level purple on the one hand all three items measure key characteristics of this level, but on the other hand the item that refers to magic is questioned as to what extent this is relevant in terms of the understanding of everyday professional life. The latter remark coincides on the one hand with the items low discrimination capacity, but on the other hand also indicates potential for a possible further development of the 9 levels for value systems approach.

In the context of ***criterion validity*** we consider to what extent a scale, if it measures what it intends to measure, correlates with corresponding external criteria (Iacobucci and Churchill, 2015; Schumann, 2011). External criteria are criteria that directly or indirectly represent or reflect the feature which the scale in question is measuring. In the present case correlation validity is one of two relevant measurements, along with predictive validity. In this regard the external criterion is measured at the same time as the values of the scale to be validated. For the 9 Levels for value systems resistance scales, via their statements the individual level scales measure the resistance to a level's values. The respondents are confronted with the result of the measured resistances. The characteristics of the relevant level are named, so that they are able to evaluate their personal rejection of them, or their resistance to them. The description of each level is not limited to the statements of the resistance scale, but includes all features of the levels. The subjects are then asked to assess to what extent the resistance values measured with the scale reflect the corresponding part of their personality characteristics. This proceeds using a scale from 0 = "does not apply at all" to 10 = "completely applies". This validation is carried out on eight test subjects after development of the scale.

Figure 10:

Level-specific correlation validities

Level	Mean Score 0 = „fully disagree“ to 10 = „fully agree"
Purple	6,3
Red	8,4
Blue	7,6
Orange	8,6
Green	7,9
Yellow	8,1
Turquoise	7,2
Average	**7,7**

Figure 10 shows an average agreement rating of 7.7 from all levels, which is to be interpreted as a good indicator of criterion validity. Differences between levels are evident. At 6.3 the level purple has the lowest correlation. This is consistent with the measured values of reliability and for it, of all the levels, having the lowest mean differences between the upper and lower extreme groups, and should be assessed as a critical indicator.

Construct validity is present if hypotheses can be derived from a target construct that is to be measured, in the present case the level resistance, which can be confirmed using the measured scale values (Bortz and Döring, 2003; Iacobucci and Churchill, 2015; Schumann, 2011). To this end a network of hypotheses is formulated about the relationship of the characteristic to be measured with other characteristics. If the relationships formulated in the hypotheses exist and the characteristics are validly measured, the relations of the empirical relative must be reflected in the corresponding relations of the numerical relative. In the case of linear relationships, this reflection can be measured for example via correlations. If certain relationships arise, this is interpreted as an indication of construct validity. In the present scale construction there are two approaches for this purpose:

1. *Hypotheses about the relationship between level affiliation and resistance level*
2. *Hypotheses about the relationship of the level resistances to each other*

Regarding 1*: Hypotheses about the relationship between level affiliation and resistance level*

A person's affiliation to a level is measured using the main scale of the 9 Levels for value systems (Dobbelstein and Krumm, 2012), and using the resistance scale the corresponding rejection of a level. According to the 9 Levels theory, level affiliation and level resistance are in an inverse relationship to each other. This means that a high measurement value for affiliation to a level is accompanied by a low measured value of resistance to this level. Mathematical indicators of this are strong negative correlation coefficients. However, at the resistance

scale's current stage of development there is currently no measurement of level affiliation and level resistance for the same group of people.

Regarding 2: Hypotheses about the relationship of the level resistances to each other

In the theory of 9 Levels for value systems certain levels are considered to have a closer relationship, i.e. a strong expression of a level is associated with strong expression of certain other levels, and in turn with low expression of other levels (Dobbelstein and Krumm, 2012; Krumm and Parstorfer, 2014). This is analogously the case with resistance to the levels. Since the developed scale measures resistance to each level independently, high and low correlations between the level resistances that are in keeping with the theory or contrary to the theory, can be assessed as indicators of construct validity. To this end first the resistances to the levels are measured using the developed scale, and then the correlation coefficient between the measured results is calculated as per Pearson. Figure 11 provides an overview of the corresponding Pearson correlation coefficients and their significances.

Figure 11:

Correlations of level-specific resistance values

Level		Purple	Red	Blue	Orange	Green	Yellow	Turkoise
Purple	Correlation according to Pearson	1	,233	,421	,270	,208	,089	,177
	significance (bilateral)		,000	,000	,000	,000	,094	,001
Red	Correlation according to Pearson	,233	1	,307	,538	,057	,188	,040
	significance (bilateral)	,000		,000	,000	,287	,000	,451
Blue	Correlation according to Pearson	,421	,307	1	,381	,282	,099	,033
	significance (bilateral)	,000	,000		,000	,000	,060	,538
Orange	Correlation according to Pearson	,270	,538	,381	1	,110	,301	,048
	significance (bilateral)	,000	,000	,000		,039	,000	,371
Green	Correlation according to Pearson	,208	,057	,282	,110	1	,270	,216
	significance (bilateral)	,000	,287	,000	,039		,000	,000
Yellow	Correlation according to Pearson	,089	,188	,099	,301	,270	1	,361
	significance (bilateral)	,094	,000	,060	,000	,000		,000
Turkoise	Correlation according to Pearson	,177	,040	,033	,048	,216	,361	1
	significance (bilateral)	,001	,451	,538	,371	,000	,000	

The listed correlations are consistent to a large extent with the 9 Levels for value systems theory. The highest and lowest two correlations are singled out as examples.

- High resistances to red coincide with high resistances to orange. The explanatory common element here is the strict orientation the people of both levels have toward their own success.
- People with a high resistance to purple also tend to have resistance to blue. A clear system of order with fixed rules is common to both levels.
- With resistance to blue and to turquoise there is no relationship between the measured values. In terms of content blue seeks explicit rules, hierarchies, and clarity; turquoise is characterised by network intelligence and collective intuition.
- Resistance to red and green also do not exhibit a parallel trend in the measurements. In terms of content this can be explained via personal success, power, and aggression as maxims of red, and consensus, fairness, harmony, or integration for green.

In summary, all indicators point to sufficient validity of the scale for measuring resistances within the 9 Levels for value systems theory. In the context of applying the scale, the basis of the data and the possibilities of validity analysis can be extended as described.

5. Items of the Resistance Scale

The resistance scale is integrated into the existing questionnaire for measuring affiliation to a Level. Separate questionnaire elements such as introductory text or segmentation questions are contained in this and therefore are not required separately (Dobbelstein and Krumm, 2012). Figure 12 also indicates, along with level, dimension, and each statement, the differences of the mean values between the upper and lower extreme groups as a key criterion of scale formation

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Figure 12:

Resistance scale items

Level	Dimension	Question Scale: Disagree (1) - Agree (5)	Mean lower 25%	Mean upper 25%	Difference between upper and lower extrem group
Purple	tradition		3,06	4,78	1,72
Purple	Archaic-magical yearnings		3,28	4,92	1,64
Purple	obedience	I don't like it when obedience is expected.	2,97	4,45	1,48
Red	personal success	Not everything should be focused on personal success.	2,19	4,45	2,26
Red	strength		2,25	4,28	2,03
Red	assertiveness		2,85	4,48	1,63
Blue	loyalty	I don't like it when loyalty stands above everything else.	2,17	4,39	2,22
Blue	order	Too much order bothers me.	1,84	3,95	2,11
Blue	Compliance with rules	I don't like always having to bow to the rules.	2,59	4,66	2,07
Orange	career orientation		2,10	4,30	2,20
Orange	growth (monetary & industrial)		2,28	4,46	2,18
Orange	profit orientation	It bothers me when everything has to be profit orientated.	2,64	4,79	2,15
Green	integration (of people)		1,79	4,13	2,34
Green	equality	It's not necessary for all to have equal rights.	1,86	4,17	2,31
Green	participation		2,25	4,41	2,16
Yellow	inspiration		1,27	3,56	2,29
Yellow	lifelong learning	I don't like it when lifelong learning becomes an end in itself.	1,59	3,59	2,00
Yellow	Personal development		1,80	3,62	1,82
Turkoise	Spiritual consciousness		1,92	4,43	2,51
Turkoise	Improvement of living conditions fo	I don't think it's right that everyone should be made responsible	1,96	4,08	2,12
Turkoise	network intelligence		2,35	4,38	2,03
For licence reasons, only the statements of the Levels Blue will be mentioned.					

Unlike with the final tool, the measurement was carried with a scale from 1 = "does not apply at all" to 5 = "completely applies".

6. Critical Reflection and Continuous Scale Optimisation

Overall the development of the resistance scale and the discussion of its quality has yielded a positive result. The following points should be noted with regard to future research:

The data basis for development of the scale consists of a convenience sample whose structural correlation with the company member population using the scale cannot be demonstrated. In the future it is recommended that the resistance scale be applied directly to the employee target group in parallel with the 9-Level scale. The data basis that will be qualitatively and quantitatively improved thereby can be used for further development of the resistance scale.

The purple level scale does not exhibit wholly satisfactory characteristics. It exhibits acceptable but not good discrimination and reliability scores, exhibits limitations in expert-based content validity, and has the lowest correlation score for criterion validity.

Due to social changes in language and values individual items can be updated at certain intervals in the empirical survey. These are to be evaluated as to whether they have an improved discrimination capacity in comparison to the previous criteria, and in the positive case can replace them. This will ensure that the resistance scale reflects ongoing semantic and substantive changes in the zeitgeist, and that its quality increases (Dobbelstein and Krumm, 2012). In this endeavour special attention is to be paid to the purple level criteria due to the described current limitations.

7. About the Authors

Thomas Dobbelstein

Prof. Dobbelstein is Prof. at the DHBW in Ravensburg and teaches market research in numerous Master's programmes, e.g. in Kempten, Dornbirn, Dresden, Heilbronn, Kapstadt, and Durban. He is Managing Director of the Customer Research 42 market research institute, and a member of various supervisory and advisory boards.

Rainer Krumm

Rainer Krumm, Managing Director of the 9 Levels Institute for Value Systems and axiocon GmbH, is a management trainer, consultant, coach, and author. He has worked within companies in over 23 different countries, accompanying, advising, training, and coaching management staff and teams. He is considered one of the most experienced international consultants and trainers in the field of corporate culture and change management - based on the developmental psychology of Prof. Clare W. Graves. With the 9 Levels Model, he has developed an analysis tool that makes value systems tangible and measurable for people, groups, and organisations.

Contact:

9 LEVELS INSTITUTE FOR VALUE SYSTEMS GMBH & CO.KG

Email: info@9levels.de - www.9levels.com

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