Public perception of sustainable development

What means sustainability and sustainable development?

What is the meaning of the terms sustainable development and sustainability? Although both terms have general positive connotation, there remains a difference between the connotation of sustainable development and sustainability. These differences are particularly true for people that do not know the terms.
By Siegmar Otto

What does the public know about sustainable development? Many people have heard about it, however, only very few actually know something about its content and discourse (Kuckartz 2004).

Apart from the discussion of sustainable development in politics and business, the question is what do people think or feel about sustainable development? Most people do not know much about the literal meaning, the denotation, of sustainable development. But they still have a sense of what it might be (Kuckartz 2004). This sense for a term or a word is described as connotation by scholasticists (Eco 1987). For mass media, with its focus on entertainment, moods and emotions, connotation is far more relevant than denotation. Hence, the aim of the study presented is to investigate the connotation of the two terms.

John Stuart Mill was the first to explicitly differentiate between connotation and denotation (Mill 1843; Eco 1987). Connotation mainly describes a term's different attributes, whereas denotation is the term's literal meaning or the object that it describes.

To assess connotation, the semantic differential technique can be used. An important advantage of the method is the fact that no definition of the evaluated construct or object is needed. It measures the semantic meaning of almost any construct, which one can relate to a scale of pairs of adjectives. This is an essential point, as it is common knowledge that sustainable development as a broad normative concept is hard to define at an operational level (Brand 2004; Brand 2000; Brundtland 2005; Ott 2004; Princen 2003; Sieferle 2004; WCED 1987).

In accordance with the aim to explicate the public connotation of the German translation of sustainability (Nachhaltigkeit) and sustainable development (nachhaltige Entwicklung), a large sample was tested with the semantic differential in order to discuss the following three issues: Firstly, the difference between sustainability and sustainable development, secondly, the familiarity with the terms and thirdly the differences for certain groups.

The measurement of meaning

The semantic differential technique, developed by Osgood, is a method to analyse the meaning of a broad spectrum of objects (Osgood 1952; Osgod et al. 1957). With the semantic differential, the connotative meaning of objects or concepts like people, words, buildings or pictures can be assessed with the help of semantically differentiated pairs of attributes administered in a questionnaire (Snider 1969). It consists of 20 to 30 bipolar rating-scales, where the object is rated usually on a seven-point scale. The raters have to judge the object and determine the direction and intensity of their rating (Bortz 2006).

The main outcome of a semantic differential study is a polarity profile for the objects that were evaluated (see Figure 1 to Figure 3). Measures to compare profiles are separated into measures of distance and similarity (Backhaus 2006; Bortz 2005; Wirtz 2002). To test the similarity, the Q-correlation coefficient was used. It has a range from -1 to +1. Where +1 means complete similarity, -1 maximum dissimilarity and 0 partial similarity (Cattell 1946; Ozer 1993). Distant wise, for this study the city block metric and the universal semantic differential as presented in Bortz and Döring was used (Bortz/Döring 2006).

The questionnaires were all the same except for the objects of interest. Sustainability was assessed in one group and sustainable development in the other. The respondents were assigned randomly to either one of the groups. Also the order of the pairs of adjectives was randomized. The subjects answered the following questions in addition to the semantic differential:

- How familiar are you with the term sustainability / sustainable development?
- Are you engaged actively in a club or party or any other organisation?
- How strongly are you interested in political issues, economic issues, scientific issues?
- Which party would you vote for, if elections would take place next Sunday?
- Are you female or male?
- What is your age in (years)?
- Do you have children?
- What is your highest level of education?
- What is your present annual pre-tax income?
- What is your present occupation?
- In which branch is your company operating mainly? ➔

Results

Most of the respondents were collected ad-hoc from the online panel Sozioland, which is an online opinion poll on voluntary basis and open to everybody. The sample cannot be considered representative for the German population. However, for the analysis of group differences as in this study, this fact is of low relevance. The interest in group differences was also the reason to add three other samples. These were (a) members or associates of an initiative of psychologists for environmental protection, (b) young members of the liberal party FDP and (c) representatives of environmental or sustainability divisions of large German companies. The whole sample includes 782 valid cases with 467 females, 310 males and five people who did not reveal their gender. 22,1 percent of the sample would vote for the Christian Democratic Party, 29,0 percent for the Social Democratic Party, 21,3 for the Green Party, 9,7 percent for the Free Democratic Party, 9,2 percent for the Left and Party of Democratic Socialism and 8,8 percent for others.

The mean age of the sample was 28,6 years. 22,9 percent of the subjects had children. Many were students, which correlates with the age distribution of the sample. This fact is also reflected in the income distribution. 36 percent of the sample earned less than 5.000 Euro a year whereas 13 percent earned up to 10.000, 13 percent up to 20.000, 12 percent up to 30.000, 8 percent up to 40.000 and 11 percent more than 40.000 Euro.

Difference between sustainable development and sustainability

One of the main aspects investigated, is the different perception of the two terms. On a literal level, sustainability is a noun, whereas sustainable development is composed of an adjective and another noun. Despite their literal difference, a synonymous use is possible because the use of words is not necessarily connected to their logical construction (Wittgenstein 1977). Indeed, in the German speaking area, sustainability is often used as the short form of sustainable development (Brand 2004).

Overall, the profiles for the two terms are quite similar as shown in Figure 1. To determine the similarity of the profiles, the Q-correlation and city-block-distance were calculated. The correlation of the profiles in Figure 1 is high (r=0,93) and their city block distance (d=4,86) small. This distance always has to be interpreted with respect to the number of data points, in this case the number of pairs of adjectives. With 25 pairs the mean distance of one pair is 4,86 / 25 = 0,19.

Even though the profiles are very similar for the whole sample, there are some differences for certain groups. In particular, the familiarity with the term should have a high impact on its perception. Hence, the subjects were divided according to their answer on the question about their familiarity with the term sustainability or sustainable development. The possible answers were on a scale from one "not familiar at all" to seven "very familiar". All people answering one to three were sorted into the group not familiar with the term and all answering five to seven were sorted into the group familiar with the term. People answering with four were excluded. Apart from the outcome that most people were rather familiar with the terms, sustainability was more familiar than sustainable development (see Table 1). This difference is significant according to a Chi-square test (CHi-square=20,7 / df=1 / p<0.001).

The two profiles of people that are either familiar or unfamiliar with the concept of sustainable development are compared for the terms sustainability and sustainable development. In accordance with the larger variance between the items, the profiles of the people who are familiar with sustainability or sustainable development diverge more from the mean. For those people familiar with the terms, the Q-correlation is 0,94 and the city block distance is 4,98 for the two profiles of the terms sustainable development and sustainability (see the two solid lines in Figure 2). For people unfamiliar with the terms, the Q-correlation is 0,68 and the distance is 7,80 for the two profiles of the terms sustainable development and sustainability (see the two dotted lines in Figure 2). Furthermore, the level of degree achieved at school correlates significantly with the familiarity of the concept (r=0,307; p<= 0,001); the higher the latest degree, the higher familiarity.

Figure 1: polarity profiles for the two terms (r=0,93; d=4,86)
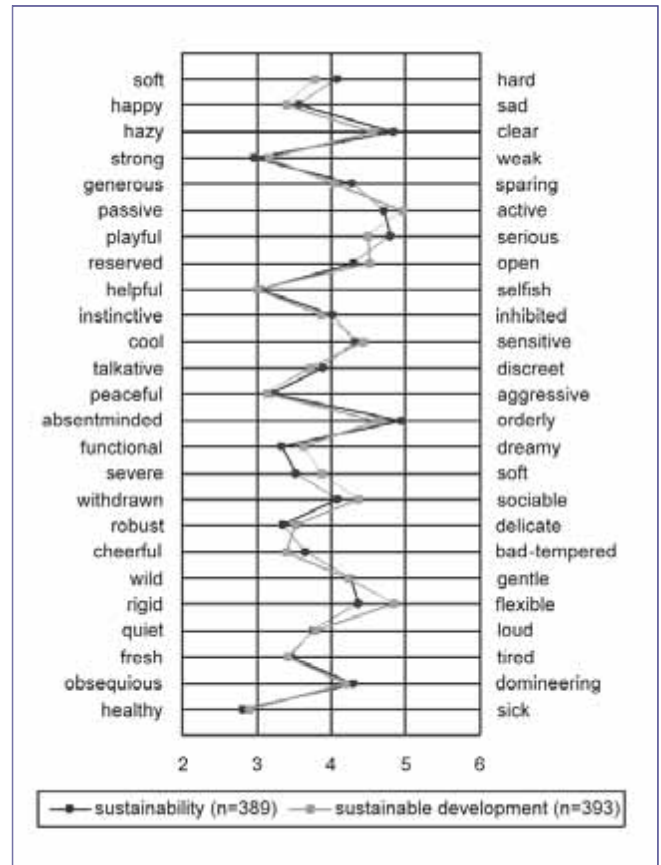
Source: author

Different groups

Apart from the online-panel, three other groups of interest were asked to evaluate the two terms. This consisted of members of an initiative of psychologist for environmental protection (n=24), active members of the young liberals (n=16) and employees from environmental or sustainable development departments of large German Corporations (n=23). Only two members of the young liberals and two members of the psychologists for environmental protection were not familiar with the term sustainable development and were excluded for further analysis. Therefore the size of the groups which were compared were as follows: 22 participants from the psychologists for environmental protection, 14 members of the young liberals, 23 people from large German corporations and 391 respondents from the online panel, who are familiar with the terms.
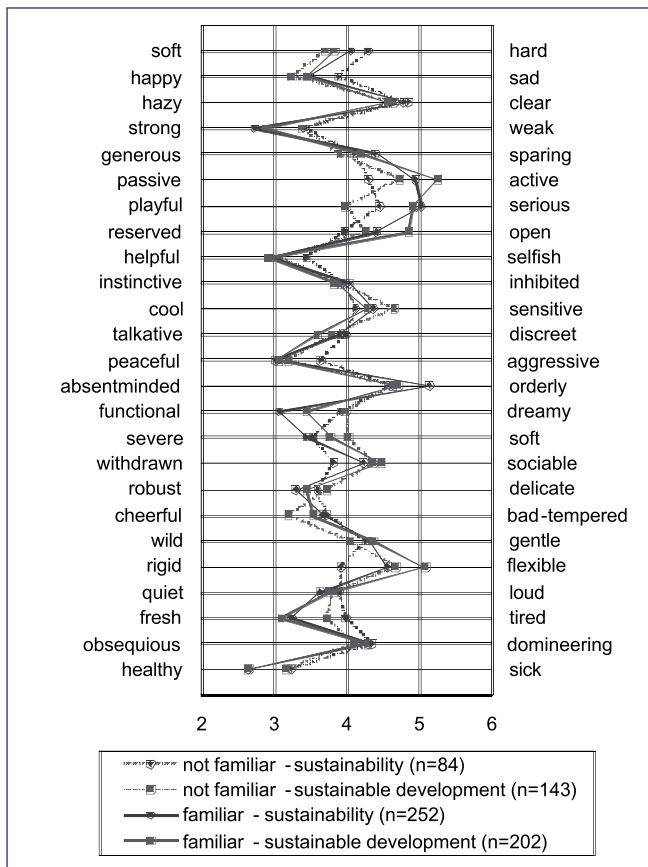
The Q-correlation was calculated for each possible pair of the

four groups (see Table 2). An interesting result is the high Q-correlation between the psychologists for environmental protection and the employees of the companies. In Figure 3 the connotation of the employees, young liberals and psychologists for environmental protection is compared to the average of the online panel. Only people familiar with the term were considered.

The profile of the young liberals does not contrast the other profiles (see Figure 3). However, it could be regarded as slightly different, e.g. more hazy, weaker, more bad-tempered and tired. This fact is also reflected in the low Q-correlation of the profiles of the young liberals with the online panel (r=0,32). Also, the city block distance with 14,62 is much larger than all the other calculated distances. ➜

Table 1: frequency of people familiar and unfamiliar with the terms

	unfamiliar	familiar	total
sustainability	84	252	336
sustainable development	143	202	345
Total	227	454	681

Source: author

Table 2: Q-correlation between the different groups (only for people familiar with the terms)

	online panel	psych. env.	employees
online panel	1		
psych. env.	0.66	1	
employees	0.81	0.87	1
young liberals	0.31	0.67	0.67

Source: author

Figure 2: polarity profile for people familiar and unfamiliar with the terms

Source: author

Figure 3: polarity profiles for the four groups online panel, psychologists for environmental protection, young liberals and employees of large German corporations (including only people familiar with the terms, for correlations see Table 2)
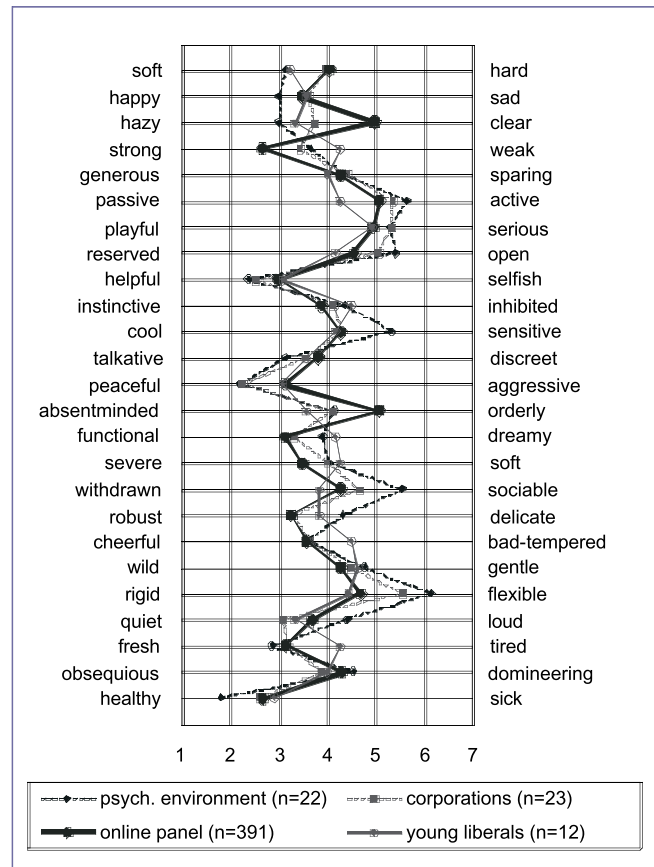
Source: author

Conclusions

It can be concluded that the two connotation profiles of the terms sustainable development and sustainability in their German version are very similar. One of the main reasons for this similarity could be their synonymous usage in mass media and in the German discourse. This assumption is supported by the findings shown in terms, the closer the connotative profiles (see Figure 2 for higher correlation and lower distance). Most people become familiar with the terms because they learn about it through mass media and the German discourse.

Furthermore, it can be inferred that the main differences of the profiles in Figure 1 result from the different words in the two terms. This is because in the case of unfamiliarity with the concept of sustainable development, the connotation of the mere word stems and their general meaning becomes more important in the semantic differential. This assumption is supported further by the fact that for people unfamiliar with the concept, the profile for sustainability shows less variance between the different items than the profile for sustainable development (see Figure 2). This is the case because the word stem sustain is much less common in German everyday language than development. This results in answers closer to the centre of the scale and hence reducing variance between the adjectives. This is a common finding when people have to answer the semantic differential for unfamiliar terms.

In contrast, there is much higher variance between items for both the terms when people are familiar with the concept (see Table 1). This fact supports the assumption that familiarity with the concept leads to a much more differentiated picture, meaning that people familiar with the concept are able to answer in a more differentiated way. The results of the Q-correlation and the city block distance support this. For people familiar with the concept of sustainable development the profiles of the two terms as shown in Figure 2 have a high Q-correlation ($r=0.94$) and a low city block distance ($d=5,0$). In contrast, the Q-correlation is smaller ($r=0.68$) and the city block distance higher ($d=7.8$) for the profiles of the two terms for people unfamiliar with the concept (see dotted lines in Figure 2).

For this reason, the profiles of people unfamiliar with the terms (dotted lines in Figure 2) give a close estimate of how the mere words were perceived, before the concept of sustainable development was introduced by the Brundtland report (WCED 1987).

The specially selected groups with partially strong political interest, young liberals and psychologists for environmental protection, showed significant differences. In this case, connotation is influenced by the political orientation (Figure 3). The connotation is more strongly correlated for the two groups employees and psychologists for environmental protection compared to the average of those knowing the concept of the online panel (see Figure 3). It can be assumed that the employees of the companies, which answered the survey, were interested in sustainable development and motivated to support it.

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