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Semantic Differential of the Concept of Beauty

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ABSTRACT

This study focuses on an exploration of the concept of beauty using the semantic differential method. 2,080 participants (53.46% were female) aged 18 to 89 (M = 41.36 years; SD = 16.48) were asked to evaluate the concept of beauty using twenty-one bipolar adjectives across three semantic differential dimensions – activity, evaluation, and potency. The results indicate that the most descriptive adjectives used to describe beauty are: pleasant, inviting, good, inspiring, pure, and kind, indicating that the concept of beauty is mostly associated with positive connotations. Furthermore, the majority of the characteristic adjectives are related to the evaluation dimension, in which statistically significant differences were identified in the evaluations made by men and women. Women perceive beauty as a concept that is significantly more strongly associated with evaluative judgments than men ($p < .01$). The potential of the semantic differential method can be used to compare the meaning of the concept of beauty with synonymous and oppositional concepts.

1. Introduction

The concept of beauty has been the subject of many scientific disciplines, including aesthetics (Dietrich & Knieper, 2022), art (Sidhu et al., 2018), psychology (Yarosh, 2019), medicine (Feng, 2020), as well as mathematics (Zeki et al., 2018), philosophy (Scruton, 2011), and biology (Jones & Jaeger, 2019). Nevertheless, it can be said that it is one of the most difficult concepts to grasp or define. A significant feature of a good definition (delimitation of the x`term) is that on one hand, it contains sufficient and exhaustive characteristics, but on the other hand, only those that are necessary (the principle of Occam's razor). Identification of the typical, key characteristics (signs) of the concept under analysis can be performed using many methods – one of them is the method of semantic differentials.

This method has been used since the 1950s (Osgood, 1957; Osgood et al., 1957) to measure the connotative meaning of a term or object, by asking respondents to rate the term using a series of bipolar adjectives. These adjectives are selected to characterise it within three main dimensions – activity, evaluation, and potency. The activity dimension relates to the degree of activity or passivity, the typical adjectives found within this dimension include "active" or

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"passive," "fast" or "slow," and "aimless" or "motivated." The evaluation dimension reflects the positive or negative attitudes or feelings people have towards the term or object, and is measured using bipolar adjectives such as "good" or "bad" and "pleasant" or "unpleasant." The potency dimension relates to the degree of strength or intensity that is associated with the item or object, and uses bipolar adjectives such as "strong" or "weak," "soft" or "hard," and "impotent" or "potent" (Rosenberg & Navarro, 2018). The adjectives can be adapted to the nature of term being studied. At the same time, the three dimensions allow the placement of the specific term in a semantic space, and when there is an analysis of several related or opposing terms, it allows an observation of their proximity.

Research into the semantic differential of the concept of beauty has not yet been conducted in Slovakia. Even abroad, such research is rare – W. Menninghaus et al. analysed the semantic differential of four concepts – beauty, elegance, grace, and sexiness. According to their findings "beauty as compared to elegance is conceived as being more multi-coloured, natural, and dreamy, and less refined, rigorous, elitist, disciplined, exquisite, expensive, exceptional, rich, svelte, and skilful. Beauty as compared to sexiness scores higher on the items soothing, delicate, fragile, feminine, simple, reserved, quiet, refined and discreet, and lower on the items libidinous, extroverted and hot. Beauty as compared to grace is conceived as more multi-coloured, natural, down to earth, younger, and hotter, and as less elitist, rich, skilful, quiet, exquisite, disciplined, refined and exceptional. Given the close affinity of elegance and grace, it is not surprising – and highlights the consistent quality of our data – that the differences obtained for beauty and grace largely overlap with those for beauty and elegance" (Menninghaus et al., 2019, 13). These examples from studies abroad raise the question of their applicability to other linguistic environments, as the concept of beauty in different languages derives from a distinct linguistic foundation and this may imply differences in its understanding (for an analysis of the etymology of the term beauty, see Demuth, 2022).

2. Objective

The main objective of the study is to describe the concept of beauty through bipolar adjectives and the semantic differential and subsequently place it in a three-dimensional semantic space using the dimensions of activity, evaluation, and potency. A partial goal is the analysis of the differences in the semantic differential of the concept of beauty between the genders.

3. Method

3.1. Procedure and Subjects

The data collection was conducted through a questionnaire. The participants were contacted in person and filled out the questionnaire with a pencil and paper. The participants were informed of the purpose of the data collection and provided informed consent prior to the completion of the questionnaire. The participants were also free to withdraw from the study during the process of data collection or shortly afterwards with no consequences. The data collection was anonymous.

A total of 2,216 participants from the whole of Slovakia took part in the study, with 122 excluded from further analysis as they provided incomplete data and 15 were excluded as they incorrectly completed the questionnaire. The final sample was made up of 2,080 subjects between 18 and 89 (M = 41.36 years, SD = 16.48). The sample included 1,112 (53.46%) women.

3.2. Instruments and Data Analysis

The questionnaire was in two parts – the first contained questions intended to collect basic demographic information from the participants (gender, age), while the second measured the connotative meaning of the concept of beauty through the evaluation of twenty-one bipolar adjectives. The strength of the evaluation of each adjective was monitored on a Likert (seven-point) scale (see Table 1).

Table 1.
Strength of the evaluation of the semantic differential

Adjective	←			**Rating**			→	**Adjective**
Verbal Evaluation	Strongly Agree	Agree	Slightly Agree	"In the Middle"	Slightly Agree	Agree	Strongly Agree	Verbal Evaluation
Numeric Evaluation	3	2	1	0	1	2	3	Numeric Evaluation

Source: Authors.

The semantic differential evaluation was carried out in three ways:

1/ Verbal evaluation. An analysis of the frequency of the ratings "Strongly Agree", "Agree", "Slightly Agree", and "In the Middle" allows the identification of those adjectives that "typically" characterise the concept of beauty (with the highest occurrence in the categories of "Strongly Agree" and "Agree") along with those that do not, as a large proportion of the participants did not lean in either direction and chose "In the Middle". This method of evaluation also enables an observation of the differences in the responses between the sexes in the evaluation of the concept of beauty.

As this frequency analysis fails to take into account the overall degree of inclination of the observed sample towards either of the bipolar adjectives (i.e., whether participants leaned towards one or the other by choosing "Strongly Agree", "Agree", or "Slightly Agree" and, in particular, to what extent this is a strong inclination), the following type of evaluation was also performed:

2/ Numerical evaluation. Based on the strength of inclination towards the extremes, 3 points were assigned to the rating "Strongly Agree", 2 to "Agree", and 1 to "Slightly Agree". Subsequently, averages were calculated for all the ratings that lent in one direction and those that lent in the other direction for the pair of the bipolar adjectives according to the formula (1):

$$M_{\text{Adjective}} = (N_{\text{Strongly Agree}} \text{ x } 3 + N_{\text{Agree}} \text{ x } 2 + N_{\text{Slightly\_Agree}}) / 3 \quad (1)$$

This allows the capture of the extent to which participants tend to express their opinions towards the extreme for each adjective and thus how strongly the adjective is associated with the concept of beauty. The use of a mean value allows the interpretation of the strength of inclination in the context of the original rating ("Strongly Agree" = 3 points, "Agree" = 2 points and "Slightly Agree" = 1 point), as well as a comparison with the response "In the Middle".

To place the concept of beauty in a three-dimensional semantic space, the following was used:

3/ Spatial evaluation. Within this type of evaluation, all three dimensions of the semantic differential of the concept of beauty were utilised – the x-axis represented the dimension "activity," the y-axis "evaluation," and the z-axis "potency". Specifically, the placement of the concept of beauty along the axis was determined by the sum of the numerical ratings of all the adjectives of that dimension, and thus was calculated according to the formula (2):

$$x = \sum M_{\text{Activity\_Adjectives}}$$
$$y = \sum M_{\text{Evaluation\_Adjectives}} \quad (2)$$
$$z = \sum M_{\text{Potency\_Adjectives}}$$

Placing the concept of beauty in a three dimensional space allows the position of this concept to be displayed in the context of the characteristic dimensions of the semantic differential. Prior to the spatial evaluation, the internal consistency of the items (adjectives) of each semantic differential dimension was evaluated. The Cronbach's alpha values ($\alpha_{\text{Activity}} = 0.698$; $\alpha_{\text{Evaluation}} = 0.751$; $\alpha_{\text{Potency}} = 0.771$) were found to be satisfactory.

The similarities/differences in the understanding of the concept of beauty between the sexes were evaluated for each dimension using Mann-Whitney U Test as there was a non-normal distribution of the data of the dimensions of semantic differential (Shapiro-Wilk p for all dimensions < .001). For the calculations the IBM Statistical Package for Social Sciences (SPSS), version 28 was used. The level for statistical significance was set at $\alpha = .05$ (95%).

4. Results

From the data on the frequency of occurrence of the individual ratings of the bipolar adjectives used to evaluate the term “beauty” (Table 2), it is evident that the highest number of responses in the “Strongly Agree” category occurred with the adjectives: pleasant (N = 952), inviting (N = 732), inspiring (N = 706), and pure (N = 678). The “Agree” category produced the adjectives: pleasant (N = 814), good (N = 780), and inviting (N = 688). These adjectives may be considered to characterise the concept of beauty.

Table 2.
Frequency of responses to the bipolar adjectives used in the semantic differential

	Adjective	Strong. Agree	Agree	Slightly Agree	In the Middle	Slightly Agree	Agree	Strong. Agree	Adjective
Activity	Exciting	351	453	230	501	113	214	218	Soothing
	Aggressive	57	94	163	692	344	414	316	Moderate
	Erotic	278	288	245	739	144	237	169	Romantic
	Expressive	472	506	296	536	109	103	58	Inconspicuous
	Strict	94	160	235	732	306	329	224	Lenient
	Impulsive	217	340	349	711	185	156	122	Judicious
	Fast	131	259	273	1,044	185	124	64	Slow
Evaluation	Inviting	732	688	260	328	43	23	6	Repulsive
	Inspiring	706	681	311	284	59	34	5	Boring
	Kind	517	523	344	511	90	51	44	Hateful
	Calm	380	526	383	569	118	77	27	Restless
	Pure	678	588	328	377	62	30	17	Dirty
	Pleasant	952	814	152	129	14	10	9	Unpleasant
	Good	650	780	290	303	37	12	8	Bad
Potency	Orderly	266	401	369	702	159	109	74	Chaotic
	Balanced	290	434	347	725	127	88	69	Unbalanced
	Understandable	265	408	349	698	154	119	87	Unintelligible
	Logical	177	275	278	816	201	187	146	Illogical
	Knowable	349	476	380	612	126	78	59	Unknowable
	Familiar	294	424	355	811	82	71	43	Strange
	Simple	264	356	262	640	193	196	169	Complicated

Source: Authors.

The mean values indicate the results of the numerical evaluation of the bipolar adjective used to characterise the concept of beauty (Table 3) and allow the identification of the intensity and direction of the evaluation for each specific adjective.

Table 3.
Mean values of the "Strongly Agree", "Agree", and "Slightly Agree" responses to adjectives in both directions

	Inclination towards			
	Adjective ←		→	**Adjective**
	Mean	**In the Middle (N)**	**Mean**	
Activity	Exciting	729.67	501.00	398.33	Soothing
	Aggressive	174.00	692.00	706.67	Moderate
	Erotic	551.67	739.00	375.00	Romantic
	Expressive	908.00	536.00	163.00	Inconspicuous
	Strict	279.00	732.00	545.33	Lenient
	Impulsive	560.00	711.00	287.67	Judicious
	Fast	394.67	1,044.00	208.33	Slow
Evaluation	Inviting	1,277.33	328.00	35.67	Repulsive
	Inspiring	1,263.67	284.00	47.33	Boring
	Kind	980.33	511.00	108.00	Hateful
	Calm	858.33	569.00	117.67	Restless
	Pure	1,179.33	377.00	57.67	Dirty
	Pleasant	1,545.33	129.00	20.33	Unpleasant
	Good	1,266.67	303.00	28.33	Bad
Potency	Orderly	656.33	702.00	199.67	Chaotic
	Balanced	695.00	725.00	170.00	Unbalanced
	Understandable	653.33	698.00	217.67	Unintelligible
	Logical	453.00	816.00	337.67	Illogical
	Knowable	793.00	612.00	153.00	Unknowable
	Familiar	695.00	811.00	117.67	Strange
	Simple	588.67	640.00	364.00	Complicated

Source: Authors.

From Table 3, it is apparent that the highest average scores were obtained for the adjectives pleasant, inviting, good, inspiring, pure, and kind, which can be considered the most descriptive of the concept of beauty. Conversely, the adjectives that participants were unable to clearly evaluate in relation to the concept of beauty were fast, logical, and familiar. These adjectives may be regarded as less able to characterise beauty. An important finding related to the characteristic connotations is that all the typical adjectives exclusively belonged to the evaluation dimension.

Based on the sum of the average scores of the adjectives that belong to each dimension of the semantic differential (Table 4), data on the position of the concept of beauty in the semantic space, as defined by the axes of activity, evaluation, and potency, were plotted in a three-dimensional space (Figure 1).

Table 4.
Frequency data of the dimensions of the semantic differential

Dimension	**Min.**	**Max.**	**Mean**	**Standard dev.**
Activity	0	21	9.0404	4.6000
Evaluation	0	21	12.6721	4.6175
Potency	0	21	8.7894	5.0196

Source: Authors.

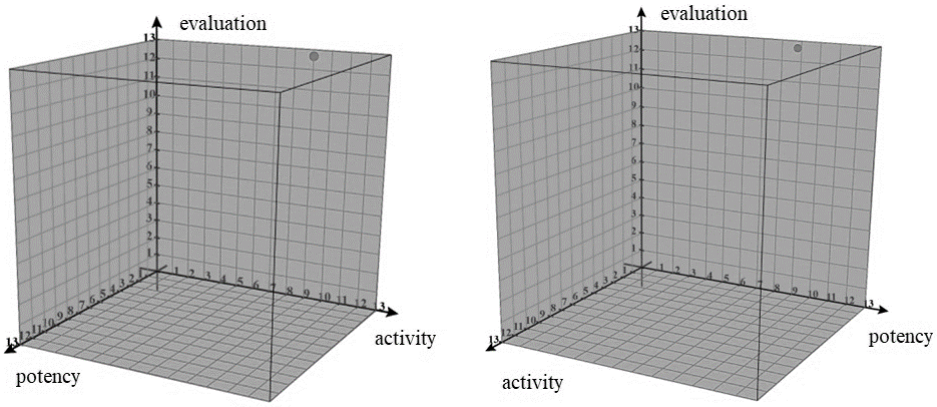

Figure 1. Placement of the concept of beauty in semantic space
Source: Authors.

From Figure 1, it is evident that the dimension of evaluation has the most significant impact on the assessment of the concept of beauty. This is in line with findings regarding the typical adjectives that are associated with the term beauty.

The differences in the concept of beauty between genders were evaluated by a non-parametric Mann-Whitney U test (see Table 5). The results of the statistical analyses demonstrate that the aspect of evaluation in the consideration of the concept of beauty is significantly more important to female participants than male participants.

Table 5.
Gender differences in the activity, evaluation, and potency dimensions in the evaluation of the concept of beauty

		Mann-Whitney U Test		
Dimension	**Sex (N)**	**Mean Rank**	**U**	**sig**
Activity	Male (968)	1,036.61	541,973.000	0.782
	Female (1,112)	1,043.89		
Evaluation	Male (968)	1,003.67	573,858.500	0.009**
	Female (1,112)	1,072.56		
Potency	Male (968)	1,033.34	545,139.000	0.611
	Female (1,112)	1,046.73		

Note. ** p <.01.
Source: Authors.

5. Discussion

The use of semantic differentials has provided data on the understanding of the concept of beauty in the group of Slovak participants. This is an area that has been under-studied in Slovakia (as well as in other countries). Only a small number of researchers (Demuthova & Demuth, 2021; Demuth et al., 2022) have conducted studies on the connotations and meanings of the concept of beauty, and the semantic differential method was not used in those papers.

In the study, twenty-one bipolar adjectives were used to capture the concept of beauty, with pleasant, inviting, good, inspiring, pure, and kind being the most typical. All of these adjectives have positive connotations, which corresponds with the general characteristics of the concept of beauty as a concept that refers to positive evaluative appraisals (Skov & Nadal, 2021). It was found that beauty is closely associated with the concepts of goodness (Han & Laurent, 2023), morality (Diessner, 2019), and health (Little et al., 2011); people who are considered to be beautiful are thought to be more intelligent and trustworthy (Corbett, 2009),

and they generally benefit from enhanced positivity (Griffin & Langlois, 2006). The existence of these links can be explained through the action of several psychological mechanisms. In the context of evolutionary psychology, the assessment of an object as beautiful is the result of evolutionary mechanisms, through which beauty becomes a visible signal of the hidden qualities of objects (see e.g., Rhodes, 2006; Tadinac, 2010). Another interpretive framework is the operation of cognitive biases based on the principle of generalisation. This includes, for example, the "halo effect" (Nisbett & Wilson, 1977), which describes a tendency to create an overall positive image of the various (even unrelated) characteristics of an individual based on an impression and evaluation of a single trait, or simply put the "what is beautiful is good stereotype" (Dion et al., 1972). This describes the judgement that physically attractive individuals have more socially desirable traits and characteristics than those who are physically unattractive (Nordholm, 1980). The common feature of these mechanisms is the fact that they point to a generally present tendency to associate beauty with many other positive characteristics.

The most prominent adjectives that characterise the concept of beauty (pleasant, inviting, good, inspiring, pure, and kind) indicate that the dimension of semantic differential "evaluation" is more characteristic of the studied concept than the dimensions of activity or potency. The results from the research group showed that the typical characteristics of beauty were mainly those that evoked qualities associated with the application of evaluative judgments. The evaluative character of the beauty concept has been studied in various areas: in morality (Tsukiura & Cabeza, 2011; Cui et al., 2019); aesthetics (Jacobsen et al., 2004, 2006), health (Foo et al., 2017), etc. Furthermore, when perceiving beautiful objects, brain activates various regions responsible for evaluations and judgements (Tsukiura & Cabeza, 2011; Wang et al., 2015; Yarosh, 2019). Beauty is definitely connected with value; not only in scientific findings (see e.g. Sanders et al., 2013), but also in everyday life – beautiful objects are treasured, admired, preserved. Regarding the examination of gender specifities, the most significant differences were found in the dimension of evaluation. In connection with the understanding of beauty, this category is more significant for women than men. Most of the existing studies that have focused on gender differences in the evaluation of beauty have concentrated on the assessment of the beauty of faces or bodies (see e.g., Li & Liu, 2021; Salusso-Deonier et al., 1993; Voges et al., 2019) – there has been very little study of the concept of beauty in the context of the term itself. It is possible that women have a tendency to more strongly associate beauty with the evaluation dimension than men due to their specific life experiences – the socio-cultural environment in which the research was conducted, in the past, linked a woman's value to her beauty, and in certain areas (fashion, media...) beauty still significantly influences the evaluation of women.

However, these assumptions need to be verified and it would be beneficial to conduct further research mapping the understanding of the concept of beauty. We consider that support for basic research into the semantic differential of the concept of beauty would stimulate this field of research and would supplement and possibly allow comparisons with our results. It would also be beneficial to expand the research to similar (synonymous) concepts to the term "beauty" and, by identifying the differences and similarities, contribute to a more specific definition of this term. Similarly, we suggest an exploration of opposing terms (antonyms) and observing the adjectives or dimensions where they differ. Given the dominance of the evaluative area, it may also be interesting to expand the number of bipolar adjectives in this dimension to potentially enable a better understanding of the concept of beauty.

6. Conclusion

Research into the concept of beauty using the semantic differential method is in its infancy – however, it appears to be a method that has great potential to describe the concept and contribute to a more specific definition. From the results, the evaluative dimension may be particularly interesting, it is possible to consider expanding the number of bipolar adjectives used. It may also be interesting to explore the similarities and differences of the term beauty with its synonyms and antonyms.

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