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Syntagmatic relations of tactile adjectives "soft" – "hard" in English

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Abstract. The article deals with the analysis of semantic combinability of antonymous tactile adjectives "soft" – "hard" in English, called forth by the pressing need of determining their syntagmatic characteristics at the present stage of language development. The application of statictical methods enabled us to objectively measure the intensity of relations of each lexeme under study with corresponding subclasses of nouns. It has become apparent that the adjectives "soft" – "hard" are statistically marked by constrasting distribution which accounts for assymetrical antonymous relations between the two lexemes.

Keywords: perception adjectives, syntagmatic relations, semantic combinability, statistical analysis, correlation analysis.

Introduction. In the course of development of the linguistic science perception (sensory) vocabulary has been receiving due attention in the works of different scholars (L. Kudrevatykh, L. Laenko, E. Rakhilina, E. Tribushinina, among others) [5; 6; 8; 9]. The keen interest in sensory vocabulary can be, in the first place, accounted for its ability to represent the result of a human's cognition of the real world. Perception vocabulary is an inherent component of language worldviews owing to the fact that the conceptualization of reality in a particular language takes place exactly on the basis of sensory information about the world.

Even though sensory vocaulary has appealed to a great number of scientists, beginning from antiquity, tactile adjectives, in particular, English adjectives with the semantic component **"soft" – "hard"** have so far received little focus from researchers studying the English language. L. P. Kudrevatykh presents a diachronic study of the lexical-semantic field of tactile adjectives which express the notion "softness". With an application of cognitive approach, L. V. Laenko conducts a contrasting study of the lexical-semantic group of adjectives with the meaning **"soft" – "hard"** on the basis of their lexical combinability in English and Russian, pointing out to specific discrepancies of conceptualizing the concepts SOFT – HARD in the corresponding linguocultures.

However, there is no specific research focusing on the semantics and lexical combinability of the two antonymous adjectives (**"soft" – "hard"**) in the English language, which, accordingly, determines the need for a present research. Appearance of new denotations that eventually results in the expansion of denotative spheres of adjectives calls for the need of checking their syntagmatic characteristics at the synchronous stage of language development.

Thus, the purpose of the undertaken study consists in the analysis of syntagmatic relations of perception adjectives **"soft" – "hard"**, in particular, their semantic combinability. The methods of research include distributive and statistical methods (chi-square test, and Phi coefficient) which allow to find out the intensity of relations between the adjectives under study with subclasses of nouns. Contextual analysis has been applied for the detachment and description of the adjectival meanings. The **empirical data** for the present study was extracted from 25 English and American novels of the 21ˢᵗ century (S. Baxter, A. Clarke, D.Brown, E.Gilbert, J.Rowling, and others).

Procedure. It has already become a point of general agreement to identify syntagmatic relations with lexical combinability (in the broad sense). The classification of lexical combinability suggested by N. Amosova and Y. Apresyan is fundamental for a number of linguistic investigations. This typology is grounded upon different syntagmatic partners that a word may have. The scholars differentiate between *syntactic*, *semantic*, and *lexical* types of combinability [1, p. 233]. In light of this approach, Koteleva defines syntactic combinability as an ability of a word to establish syntagmatic relations with other words at the level of some grammatical category (e.g. "parts of speech"), that is to say, at the level of a class of words [4, p. 81]. According to V. Levickij, "semantic combinability implies the ability of a lexical unit to combine with other words at the level of a group of words" [7, p. 245]. Lexical combinability (in the narrow sense) is a combination of two words: a lexical unit and any other word. Thus, a lexical unit may combine with: 1) a class of words; 2) a group of words; 3) individual words.

The current study addresses issues of semantic combinability of the adjectives **"soft" – "hard"** in the pattern "*a word + a group of nouns*". The analysis of attributive (AN-combinations) and predicative uses (subjects were taken as head-nouns) and the ongoing classification of head-nouns into corresponding subclasses yielded the following results, presented in Table 1 below (see Table 1).

As exemplified in Table 1, the frequency of occurrence (hereafter "FO") of the adjective **"soft"** is somewhat higher than that of the adjective **"hard"**. For example, **"soft"** is characterized by superior numbers with the following subclasses: "*human appearance*", "*nature and space*", "*clothes and footwear*", "*interior objects*", and others. In sum, there are 14 such subclasses (where **"soft"** is a quantitative leader).

It is possible to assume that the frequency of synchronous emergence of two words in a text may depend on the FO of every separate word. For example, the combinability of the pattern "**soft** + the noun subclass *human appearance*" is predetermined both by relatively high frequencies of the adjective **"soft"** and the subclass of nouns denoting human appearance. The lexeme **"soft"** with the frequency $n = 459$ indeed has the highest figure, while the noun subclass "*human appearance*" ($n = 144$) is dominant among other subclasses (by way of illustration, see Table 1). A similar pattern can be observed in the relation of the following subclasses with the given adjective: "**soft** + *acoustic phenomena*" ($n = 110$), "**soft** + *light phenomena*" ($n = 49$) and so on.

Table 1

Syntagmatic relations of the adjectives "soft" – "hard"

№	Subclasses of nouns	Adjectives under study		
		soft	hard	Total
1.	Human appearance	87	57	144
2.	Names of humans	12	4	16
3.	Social status	1	5	6
4.	Proper nouns	2	1	3
5.	Flora	13	2	15
6.	Fauna	3	0	3
7.	Nature, space	35	6	41
8.	Clothes, footwear	14	6	20
9.	Edifices, premises	3	13	16
10.	Interior objects	24	4	28
11.	Inanimate objects	7	7	14
12.	Substance, materials	19	17	36
13.	Food, beverages	6	5	11
14.	Time notions	7	26	33
15.	Character traits and humans' features	14	18	32
16.	Feelings, emotions, relationships	6	18	24
17.	Abstractions	16	42	58
18.	Actions, arrangements	12	20	32
19.	Acoustic phenomena	94	16	110
20.	Olfactory phenomena	2	1	3
21.	Light phenomena	46	3	49
22.	Motion, movement	15	9	24
23.	Language and speech units	5	6	11
24.	Shapes, figures	12	15	27
25.	Other notions	4	8	12
	Total	459	309	768

Table 2

Quantitative characteristics of noun subclasses

№	Noun subclasses	Frequency of occurrence	Range of combinability	Utilization value	Span
1.	Human appearance	144	1	4	36
2.	Names of humans	16	1	1.3	11
3.	Social status	6	1	1.5	4
4.	Proper names	3	1	1	3
5.	Flora	15	1	1.2	13
6.	Fauna	3	0.5	1	3
7.	Nature, space	41	1	1.7	24
8.	Clothes, footwear	20	1	1.8	11
9.	Edifices, premises	16	1	2	8
10.	Interior objects	28	1	1.5	18
11.	Inanimate objects	14	1	1.4	10
12.	Substances, materials	36	1	2.1	17
13.	Food, beverages	11	1	1.1	10
14.	Time notions	33	1	4.1	8
15.	Character traits and humans' features	22	1	1.2	18
16.	Feelings, emotions, relationships	24	1	1.4	17
17.	Abstractions	58	1	2.3	25
18.	Actions, arrangements	32	1	1.3	24
19.	Acoustic phenomena	110	1	3.1	35
20.	Olfactory phenomena	3	1	1.5	2
21.	Light phenomena	49	1	2.6	19
22.	Motion, movement	24	1	1.1	21
23.	Language and speech units	11	1	1.8	6
24.	Shapes, figures	27	1	2.7	10
25.	Other notions	12	1	1.5	8

Nonetheless, such regularity is not absolute, since a less frequent adjective "**hard**" (*n* = 309) is combined with a subclass "*abstractions*" (*n* = 58), which is the third in the FO. These findings appear to suggest an irregularity in syntagmatic relations of the adjectives under investigation. Therefore, we find it necessary to introduce one more parameter – *the range of combinability* (hereafter "RC"). This parameter here refers to the differences in combinability of every subclass with the adjectives under study. The RC is expressed by some relative value (from 0 to 1), namely by the ratio between the number of recorded word combinations and the total number of units that constitute the database under investigation. Figures from Table 2 indicate that in all noun subclasses the RC equals 1, with the exception of the subclass "*fauna*" (the RC equals 0.5). Apparently, almost homogenous RC in all the noun subclasses is called forth by a relatively small number of units which constitute the database under study (only 2 adjectives). Therefore, in order to differentiate between noun subclasses in a more explicit way as well as to characterize the degree of their relation with the adjectives "**soft**" – "**hard**" we introduce such a relative value as *the utilization* of noun subclasses. In order to get this parameter, it is necessary to divide the total number of all word occurrences by the span of a subclass. Specifically, with the words "**soft**" – "**hard**" 24 nouns with the meaning of "*substances, materials*" were used by the authors 36 times. The utilization value of this subclass with the adjectives "**soft**" – "**hard**" equals 36: 17 = 2.1.

The findings of utilization value of all the noun subclasses with the adjectives under study in English fiction are shown in Table 2.

As exemplified in the table above, the subclasses of the most frequently occurring syntagmatic partners have a rather high utilization coefficient: "*human appearance*" – 144: 4; "*acoustic phenomena*" – 110: 3.1; "*light phenomena*" – 49: 2.6. Taking into account these highly contrastive patterns, we refer to statistical methods to check the correlation between the abovementioned values.

Since the number of observations *n* for each pair of adjectives equals 25 (the number of syntagmatic relations according to Table 1), then the number of degrees of freedom for correlation analysis makes up df = 25 - 2 = 23.

According to statistical table the statistically significant coefficient equals: r = 0.40 at the significance level α = 0.05 (5%) or r = 0.51 at the significance level α = 0.01 (1%). Thus, the relations between the values of frequency and utilization lower than 0.40 (≤ 0.40) are considered weak; from 0.40 to 0.51 (> 0.40; < 0.51) – medium; higher than 0.51 (0.51 ≥) – strong. Table 3 illustrates the data of statistical analysis.

Table 3

Coefficient values of the noun subclasses correlation

	Range	Utilization	Span
Frequency	0.17	0.67	0.86
Range		0.21	0.25
Utilization			0.33

It is apparent from the table above that there is a rather high correlation ($r = 0.67$) between the frequency and the utilization of noun subclasses with the adjectives "**soft**" – "**hard**". As it can be observed, the utilization depends on the frequency of occurrence of the whole subclass or its separate elements. Again, this signifies that certain contextual partners have considerable syntagmatic potency. Utilization also depends on the span of a subclass ($r = 0.33$), but such ratio is not significant. On the other hand, we observe a very high correlation between the frequency of occurrence of noun subclasses and the number of elements that constitute a certain subclass ($r = 0.86$). It is, therefore, obvious that the extension of span results in the increase of its frequency. As regards the range parameter, it negligibly depends on frequency ($r = 0.17$) and largely – on utilization ($r = 0.21$) and span ($r = 0.25$), and the correlation coefficient in this case is insignificant.

The range of cominability of adjectival lexemes is analyzed on the basis of their combinability with different subclasses of nouns. Specifically, the adjective "**soft**" enters into syntagmatic relations with 25 out of 25 subclasses, while its opposite, "**hard**", combines with 24 out of 25 subclasses. In the first case the RC equals $25:25 = 1$, and in the second the RC equals $24:25 = 0.96$. As it can be observed, the RC value of both adjectives is quite high and almost the same. Apparently, this result is called forth by certain factors. On the one hand, the adjectives "**soft**" and "**hard**" are centre, dominant lexemes of semantic groups that denote "softness" and "hardness", therefore, it is quite logical that their combinability has to be the widest.

The investigation of syntagmatic relations between lexical items should not be confined to registering the range and frequency of occurrence in a text. An important feature of combinability is the strength of relations, that is, their *intensity*. The data on the intensity of relations of adjectives with different subclasses of nouns is obtained by means of statistical methods, Chi-square test, and contingency coefficient Φ.

$$\chi^2 = \sum \frac{(O-E)^2}{E}, \qquad (1)$$

where
$\chi 2$ – the criterion of congruence or correlation;
Σ - total;
O – practically researched values;
E – theoretically projected values.

$$\Phi = \frac{ad - bc}{\sqrt{(a+b)(c+d)(a+c)(b+d)}}, \qquad (2)$$

where Φ – the coefficient of mutual contingency;
a, b, c, d – empirical values in a four-field table.

While the χ^2 value indicates the presence or absence of a relation, the coefficient Φ points to the intensity of this relation. Since the critical value of χ^2 is 3.84, the combinations in which the degree of a relation equals or exceeds 3.84 are considered standard. All the instances when χ^2 is smaller than 3.84, are statistically insignificant. The measure of the relation between markers was established by means of the coefficient of mutual contingency (Φ) that can range from 0 to 1 depending on the presence or absence of a relation.

The analysis of χ^2 and Φ values of each adjective under study with the noun subclasses has produced the following findings. The adjective "soft" has standard syntagmatic relations with such subclasses of nouns:

1) soft + "*acoustic phenomena*" ($\chi^2 = 35.23$; $\Phi = 0.21$). For example, "*The cries of hopelessness against the howling wind of the Pyrenees and the soft sobs of forgotten men* " [2].

2) soft + "*colour and light phenomena*" ($\chi^2 = 25.33$; $\Phi = 0.18$). For example, "*Illuminated in the soft lights of the deserted entresol, the two pyramids pointed at one another, their bodies perfectly aligned, their tips almost touching*" [2].

3) soft + "*nature, space*" ($\chi^2 = 11.80$; $\Phi = 0.12$). For example, "*The metal looks delicate, and marble is a soft rock*" [2].

4) soft + "*interior objects*" ($\chi^2 = 8.14$; $\Phi = 0.10$). For example, "*His bed was soft like a cloud, and the air around him smelled sweet with candles*" [2].

5) soft + "*flora*" ($\chi^2 = 4.60$; $\Phi = 0.08$). For example: *soft grass, soft petals, soft moss*, *soft bloom*, etc.

The adjective "hard" has the following standard syntagmatic relations:

1) hard + "*abstractions*" ($\chi^2 = 27.02$; $\Phi = 0.19$). For example, "*Malenfant kept his grip on Emma and Cornelius, focused on the hard physical reality of their suited flesh*" [3].

2) hard + "*time notions*" ($\chi^2 = 21.31$; $\Phi = 0.17$). For example: *hard year, hard day, hard night, etc*.

3) hard + "*feelings, emotions, relationships*" ($\chi^2 = 12.45$; $\Phi = 0.12$). For example, "*Even though Webb had come back for Lucinda's sake, there were hard feelings between them that needed to be settled*" [3].

4) hard + "*edifices, their elements, and premises*" ($\chi^2 = 11.43$; $\Phi = 0.12$). For example, "*He stumbled back, fetching up against the hard, slippery wall...*" [3].

5) hard + "*actions, arrangements*" ($\chi^2 = 6.88$; $\Phi = 0.19$). For example, "*The tether immediately started to unravel, so Malenfant risked everything and gave the tether a hard yank*" [3].

6) hard + "*social status*" ($\chi^2 = 4.67$; $\Phi = 0.08$). For example: *hard master, hard lieutenant, etc*.

Conclusion. Given the importance of statistical analysis to the study of syntagmatic relations of linguistic units, the present invastigation has shown standard elements of combinability of the adjectives "**soft**" – "**hard**" at the level of semantic subclasses. As the analysis of empirical data indicates, the antonymous tactile adjectives "**soft**" – "**hard**" are characterized by contrasting distribution with 25 subclasses of nouns. This fact explicitly points to the phenomenon of asymmetry which is typical for antonymous pairs and conditions the opposing nature between the two contrasting lexemes. As the procedures of the undertaken research have demonstrated, the χ^2 value is not necessarily directly proportional to the indices of occurrence. Even though the adjectives under study with opposite denotational meanings, have a similar range of combinability and oftentimes exhibit similar patterns of usage, yet, neither a wide range of combinability nor the frequency of occurrence are the factors which condition a close relation between the markers. Undoubtedly, this

proves the validity of applying statistic methods for analyzing linguistic phenomena.

Future research might explore paradigmatic relations of the dominant lexemes "**soft**" – "**hard**", as well as other lexical items that belong to the reviewed microsystems.

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Нузбан А.В. Синтагматические отношения тактильных прилагательных "soft" – "hard" в английском языке
Аннотация. Статья посвящена анализу семантической сочетаемости антонимических тактильных прилагательных "soft" – "hard" в английском языке, обусловленному необходимостью определения их синтагматических характеристик на современном этапе развития языка. В результате выяснилось, что прилагательные "soft" – "hard" имеют статистически контрастную дистрибуцию, что обьясняеться наличием антонимической асимметрии между двумя лексемами.

Ключевые слова: перцептивные прилагательные, синтагматические отношения, семантическая сочетаемость, статистический анализ, корреляционный анализ.