USING CORPUS DATA IN ENGLISH-GERMAN EQUIVALENCE DETERMINATION: A CASE STUDY OF ANGER-LIKE EMOTION CONCEPTS IN RELATED CULTURES

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Abstract: The article develops a three-stage methodology by which the equivalence of language designations of emotion concepts (ECs) ANNOYANCE, ANGER, and RAGE is clarified since there are discrepancies in the German translations of emotion model by R. Plutchik while reproducing these designations. The methodology was tested in the following stages: 1) the definitional analysis ("sifting out" false cases of equivalence and the identification of those lexemes in German that most fully convey the semantics of the English nouns *anger*, *annoyance*, and *rage*); 2) refining the results of the definitional analysis by determining the cultural relevance of the ECs ANNOYANCE, ANGER, and RAGE and their German equivalents (processing frequency diagrams of Google Books Ngram Viewer online service and the indicators of the most frequent collocates of query words *anger*, *annoyance*, *rage*, *Ärger*, *Wut*, and *Zorn*, and establishing emotional proximates of these ECs; 3) verifying the results of the first and second stages on the basis of arousal indicator of emotional proximates of analysed ECs. This approach made it possible to identify that a certain relevance level of ECs ANGER – WUT, RAGE – ZORN and ANNOYANCE – ÄRGER is traced by parameters of (a) content, (b) cultural relevance and (c) intensity. This means that the representatives of the German speaking culture perceive ECs ÄRGER, WUT, and ZORN with the associations similar to those the speakers of English experience in connection with ECs ANNOYANCE, ANGER, and RAGE.

Keywords: anger-like emotion concept, English, German, translation, equivalence, semantics, language corpus

1. Introduction

The end of the previous century saw qualitative changes in the approaches to the study of emotions in linguistics. The same period witnessed the spread of the ideas of cognitive linguistics, whose adherents paid attention to the very nature of emotions while previously linguists had tended to study the emotive component in the meaning of language units. This methodological change was based on the assumption that human emotional level can interact with the language level via cognition. The assumption is grounded in the basic postulate of cognitive linguistics concerning the correlation of language structures with cognitive structures. The latter in their turn interact with emotions (Damasio 1994), which makes obvious the interrelation between language, cognition, and emotions. For instance, a person can express emotions by means of expressive language. No less important are designations of emotions as they can direct language expressive resources to a particular type of emotional experiences (Colombetti 2009: 20). If denotations of emotions are characterized by cross-cultural variation, then it is logical to assume that the representatives of different cultures code, memorize, and respond to emotions differently (Russell 1991: 427). Therefore, labelling emotions can play a role in the cognitive processing of emotional experiences.

In view of this, only an accurate reproduction of the labelling of emotions may evoke adequate emotional experiences on the part of the target language speakers, which makes the translation of words denoting emotions a difficult issue for translators. It is obviously connected with the fact that human emotional world is a complex dynamic phenomenon balancing between a person and the community this person belongs to. On the one hand, the expression and course of even basic (universal) emotions are somewhat subjective since every individual has a peculiar physiology as well as a unique level of mental and moral development, which affects both the physiological expression of emotions and the course of a particular emotion as demonstrated by a separate person. On the other hand, expression and perception of emotions to a certain degree depends on sociocultural factors as every individual is part of a definite linguistic community (Mizin 2022; Mizin, Slavova 2023). As a result, in emotions one can clearly trace the amalgam of universal and culturally specific factors (Oster 2023), which makes it possible to define emotions not only as human mental states and processes but rather as much more complex phenomena – cultural concepts (Kövecses 1990; Mizin et al. 2021; Russell 1991; Wierzbicka 1999).

This implies that when looking for the lexical equivalents of the emotion words in the target language, a translator has to remember that

it concerns the transfer of cultural concepts rather than the reproduction of the meanings of linguistic units. That is why he has to render adequately entire fragments of the "foreign" emotional world represented by ECs and to reproduce the cultural senses of the latter as accurately as possible. This task is challenging even for experienced translators as ECs cannot be identical in different linguistic communities if only because of the sociocultural information encoded in them. A particular problem is posed by specific ECs, whose designations, as a rule, have no lexical equivalents in the target language (Mizin, Ovsiienko 2020; Ogarkova, Soriano 2023). Even if such equivalents do exist, it is very difficult to find an equivalent denotation for those ECs that represent close complex emotions, differentiated only by one feature (cf. semantic proximity of Germ. ECs WUT and ZORN: Oster 2014).

If there are doubts concerning the equivalence in the target language of the word fixed in a bilingual dictionary as a lexical correspondence of the labelling of a particular EC from a source linguistic community, a translator can verify the equivalence of the lexemes by means of comparative-translation analysis of the latter. However, it requires considerable time and intellectual resources unaffordable for practicing translators. A much quicker and simpler way to solve this problem is offered by language corpora – primarily bilingual (parallel) ones, as well as those of the source or target languages. It is explained by the fact that, firstly, nowadays most corpora are freely available, secondly, corpus linguistics methodology is quite objective in terms of the study of cultural concepts including ECs (Mizin, Ovsiienko 2020). One of the main aims of parallel corpora, containing source texts and their translations, is the possibility of using their data – linguistic and statistical – in translation analysis. However, unlike monolingual – nonparallel – corpora, the results of the parallel corpora study can be slightly more subjective since they contain "human" rather than machine translations.

It should be noted that representational corpora provide ample opportunities for digital processing of language units, in particular, they have the function of automatic calculation of frequency data concerning the compatibility of query words. By entering a query word, one can obtain frequency indicators of its occurrences (co-occurrences and collocates), which makes it possible to determine relevant semantic shades of a particular word, and when extrapolated to the conceptual level – relevant senses of the EC that this word denotes. Since most frequent occurrences objectify the most relevant senses of ECs, their comparative analysis can reveal semantic differences even in the case of very close concepts.

In view of this, the aim of the article is development of the methodology that can be used to clarify the equivalence of the words naming ECs by processing the data of language corpora. The methodology approbation is carried out on the example of language designation of anger-like (the term *anger-like* according to: Goddard 1991) ECs represented on "the anger petal" (Fig. 1) of a well-known adaptive model of emotions "Wheel of emotions" by R. Plutchik (1997). The choice of the research material is conditioned primarily by the fact that translation of emotion designations goes beyond the linguistic level, since here one deals not so much with conveying the meanings of such units into the target language as with adequate reproduction in the target linguistic communities of ECs of entire fragments of the "foreign" emotional world through cross-cultural transfer.

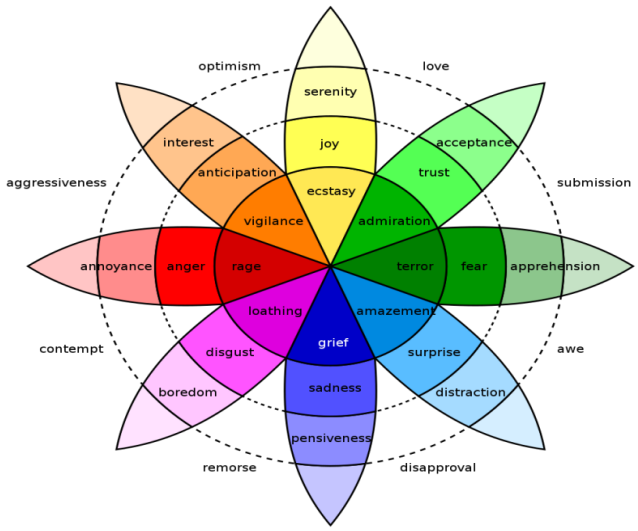

Figure 1: English-language version of "Wheel of emotions" by R. Plutchik

2. Methods and material (language corpora)

The following provisions are methodologically relevant for the research:

1. As emotions are inherent in humans as a species, emotional experiences of the representatives of different cultures largely coincide. With this in mind, when translating designations of emotions, a translator has to remember that the absence of a language designation of a certain emotion in the target language does not necessarily mean that this emotion is unknown to its speakers. In the case of lacunarity in the language designation of a particular emotion in the target language, a translator can always use a descriptive translation. However, the search

for the lexical equivalent is more expedient. As a rule, a translator has at his disposal several potentially suitable equivalents and he has to choose the one that can evoke the most adequate emotional response on the part of the target linguistic community representative. With regard to the emotion of anger, based on the analysis of 64 languages out of 60 basic language groups, scholars have found language designations of this emotion in all the languages where the names of emotions exist (Hupka et al. 1999). Anger-like words are found even in language communities with the smallest lexicon for anger (Ogarkova 2013).

2. By ECs we mean cognitive constructs, the branched conceptual structure of which is a complex hierarchy of emotional and cultural senses, objectified, as a rule, by language units. Accordingly, ECs are represented both at the cognitive (conceptual) and language levels. This two-level nature of ECs directly correlates with the concept of 'equivalence', since the latter can be structural or conceptual: the former is based on the same morpho-semantic characteristics of certain words, and the latter is present when two words denote the same concept (Pavlenko 2008).

3. Despite the cross-cultural spread of anger-like ECs, there is a lack of unequivocal equivalents designating the latter in different languages (Durst 2001; Fries 2004; Goddard 1991; Ogarkova et al. 2012; Oster 2018, 2023; Soriano et al. 2013). It refers both to the quantity, since different cultures have a different number of anger-like ECs, and to the content, as there are no equivalents among the words naming prototypical meaning of anger in every language. There is no complete equivalence of anger-like words even in typologically close languages, such as English and German, as rightly noted by anger researchers (Durst 2001: 188).

4. Basic emotions, in particular anger, are characterized by different arousal or strength of expression. Intensity is definitely relevant to differentiate anger words within a language and purported translation pairs in different languages (Ogarkova, Soriano 2023: 1095). The intensity scale is clearly illustrated by "the petals" of Plutchik's model where the strength of the emotion expression increases from the periphery to the centre. Less intense ("the flower" periphery) and more intense ("the flower" centre) manifestations of basic emotions have separate language designations, i.e. "the petals" are represented by three anger-like emotions that differ in fact only in their intensity: basic emotion – *anger*; low arousal ("the flower" periphery) – *annoyance*; high arousal ("the flower" centre) – *rage*. It should be noted that dozens of emotions each "petal" contains are not shown on this model. The German "anger petal", for example, covers such derived emotions as *Empörung* 'indignation', *Entrüstung* 'dissatisfaction', *Anstoß* 'annoyance', *Raserei* 'fury', *Groll*

'malice/grudge', *Grimm* 'embitterment', *Verdruss* 'sadness', *Unwille* 'displeasure', *Verärgerung* 'discontent' etc. Scholars claim that the German language has 17 words conveying the semantics of anger against 23 words with similar semantics in English (Ogarkova et al. 2012: 273).

5. Proceeding from the fact that emotional senses dominate in ECs, there is a possibility to identify the most relevant of them, i.e. to find the closest concepts-correlates. The hierarchy of the latter in the semantic structure of a particular EC can form a clear view of its content. This hierarchy can be visualized as a list. A comparative analysis of such lists presented in the tables can reveal rather imperceptible differences in the semantic structure of close ECs both within the same linguistic community and in cross-cultural studies. In the field of English corpus linguistics, a close correlation of concepts is defined as *conceptual proximity* (Oster 2012: 338), therefore the above-mentioned concepts-correlates can be correctly called *conceptual proximates* (CPs). The latter can be identified on the basis of frequency of collocates and co-occurrences of ECs denotations.

The methodology of the proposed research involves the implementation of the following stages:

1. Identifying the equivalence of the designations of ECs representing "the anger petal" in the source (British, Americans) and target (German) linguistic cultures through the comparative analysis of their definitions.

2. Refining the results of the definitional analysis by determining the cultural relevance (importance or prevalence) of the analysed ECs. The identification of the latters' cultural relevance is based on the frequency diagrams of Google Books Ngram Viewer (GBNV) online service as well as the data of the study samples represented by a list of ten most frequent collocates of the query words *anger*, *annoyance,* and *rage* and their German equivalents (Tables 1 and 2). When creating the samples, we took into consideration the indicators of frequency and typical compatibility of collocates only of those lemmas that are denotations of emotions. The fact that these lemmas objectify the most relevant emotional CPs makes it possible to consider the sample size sufficient for understanding the basic senses in the conceptual structure of ECs.

3. Verifying the results of the first and second stages on the basis of arousal indicator of those basic senses, i.e. CPs, that are contained in the conceptual structure of ECs ANNOYANCE, ANGER, and RAGE and their German equivalents (Tables 3 and 4). Arousal of such CPs is defined on the basis of the ANEW-ratings data (Bradley, Lang 1999). For this research the distinction of the notions "intensity" and "arousal" is not essential, which enables the measurement of intensity based on the arousal index.

The methodological background for this is the fact that arousal refers to intensity of an emotion, i.e., the strength of the associated emotional state (Citron et al. 2014: 79).

Limitation: according to the conception of our study, ECs and CPs that represent them are cultural concepts. This means that in the process of cross-cultural study of these concepts, it should be taken into consideration that their designations may not have complete equivalents in the target languages. This fact may affect the results of our research to some extent, since due to the lack of a list of German words with their intensity, processed by the ANEW method, we presented in Table 4 the data of the English equivalents of these words. At the same time, the authors realize that the data in this table may be somewhat inaccurate. However, for the purposes of this study, such inaccuracy is considered irrelevant.

Sample formation is based on German and English web-corpora that are quite commensurate in their technical and content parameters (size, tagging, functions etc.): Word Web Corpus (iWeb) containing 14 billion words and Webkorpus, created within the project Digitales Wörterbuch der deutschen Sprache (DWDS). The size of the latter is more than 8.5 billion words.

3. Results and discussion

3.1. Identification of correct and false cases of equivalence based on definitional analysis

Inaccuracy in conveying anger-like ECs can be provoked by "naïve" translators, i.e. those who have a naïve idea both of translation and human emotions. The translation of such "experts" is similar to machine translation as they tend to choose the first meaning of a polysemantic word. However, professional translators can also be inaccurate when reproducing emotion donations, since their perception of emotions can be considered "naïve", which is obvious in German translation of the English "anger petal" represented by lexemes *annoyance*, *anger,* and *rage*. Here the translators overlooked the fact that one of the basic criteria for differentiating these lexemes is the intensity of expressing the emotion of anger. It is clearly evidenced by their definitions:

annoyance – "1) the act of annoying someone or of being annoyed; 2) the state or feeling of being annoyed; 3) a source of vexation or irritation" (M.-WD); "1) the feeling or state of being annoyed; 2) smth. that makes you annoyed" (CD);

anger – "1) a strong feeling of displeasure and usually of antagonism; 2) a threatening or violent appearance or state" (M.-WD); "a strong

feeling that makes you want to hurt someone or be unpleasant because of smth. unfair or unkind that has happened" (CD);

rage – "1) violent and uncontrolled anger; a fit of violent wrath; 2) violent action (as of wind or sea); 3) an intense feeling; 4) a fad pursued with intense enthusiasm" (M.-WD); "1) (a period of) extreme or violent anger; 2) an exciting or entertaining event involving a lot of activity; 3) to be very popular or fashionable" (CD).

Failure to take this point into account caused some inconsistency in the English-German translation of these lexemes, e.g.: Germ. *annoyance* – *Verdruss*, *anger* – *Ärger*, *rage* – *Wut* (Stangl 2023; Grünewald 2023); *annoyance* – *Verdruss*, *anger* – *Groll*, *rage* – *Wut* (Hildebrand 2014: 7); *annoyance* – *Reiz*, *anger* – *Ärger*, *rage* – *Wut* (Plutchik 2023); *annoyance* – *Gereiztheit*, *anger* – *Ärger*, *rage* – *Wut* (Knipprath 2023). These examples illustrate differences in translation even of lexeme *anger*, which denotes the basic manifestation of this emotion (the middle of "the petal"), even though there should not be any ambiguity in this case. The reason for this lies in the fact that the emotional world arises in the "naïve" mind as amorphous non-discrete substance. An individual is often unable to designation the emotion he is experiencing. It is even harder to translate something that does not have a clearly defined form and content.

To determine the equivalence of the words representing the German variant of "anger petal" – *Verdruss*, *Ärger*, *Wut*, *Groll*, *Reiz*, *Gereiztheit,* bilingual dictionaries were predominantly used, e.g.:

Verdruss – "annoyance; chagrin" (CD); "frustration" (Collins);

Ärger – "anger; trouble; annoyance" (CD); "1) annoyance; anger; 2) trouble; worry" (Collins);

Wut – "rage; fury; mania" (CD); "rage; fury; frenzy" (Collins);

Groll – "grudge; resentment" (CD); "anger; wrath; resentment" (Collins);

Reiz – "stimulus; appeal; attraction" (CD); "stimulus; attraction; appeal; charm" (Collins);

Gereiztheit – "irritability; testiness; touchiness" (CD); "irritability; testiness; touchiness; edginess" (Langenscheidt).

The study of bilingual dictionaries does not provide a clear understanding concerning the equivalence of the lexemes under study. It is especially true of the noun *Reiz*, which practically does not show the semantics of anger and its shades. In this case, a more detailed analysis of the definitions of these lexemes in explanatory dictionaries is required, e.g.:

Verdruss – "(on-going) displeasure" (WbI); "anger; displeasure; resentment" (DWDS);

Ärger – "1) spontaneous, internal, emotional reaction of high-level dissatisfaction to a situation, person or memory that the angry person would have preferred to have seen differently; 2) an upsetting experience" (WbI); "1) displeasure, sullenness; 2) repugnance, unpleasantness" (DWDS);

Wut – "strong agitation of the mind, a feeling of great anger, often associated with aggressive behaviour" (WbI); "1) violent, angry excitement, increased to the point of rage; 2) excessive zeal; 3) rabies" (DWDS);

Groll – "1) long-lasting but silent anger, hidden hatred, hidden enmity (exalted style); 2) suddenly surging and erupting anger (outdated)" (WbI); "restrained anger; quiet hatred" (DWDS);

Reiz – "1) external or internal influence on an organism; 2) enticing effect emanating from a thing or person" (WbI); "1) specific, physically conditioned influence emanating from the environment or the organism itself, which is received and processed by the sense organs in a specific form; 2) pleasantly attractive effect that emanates from a thing for somebody, enticement, incentive, attraction; 3) beauty, magic" (DWDS);

Gereiztheit – "state of nervous tension" (WbI); "tense mood" (DWDS).

Based on the semantics of the analysed German lexemes recorded in representational monolingual dictionaries, it is possible to determine that: (1) there are no grounds whatsoever to consider the Germ. noun *Reiz* an equivalent – even partial – of the Engl. lexeme *annoyance* (cf. Plutchik 2023); (2) the Germ. noun *Ärger* is semantically closer to *annoyance* than to *anger*, which testifies to a certain incorrectness in most of the given above translations of "the anger petal" into German; (3) the German lexeme *Groll* shows only partial equivalence with the Engl. lexeme *anger.* In addition, unlike the latter, *Groll* has limited functioning in the German-speaking community due to its high stylistic marking; (4) given the criterion of the presence of the semantic feature of low anger arousal, the greatest number of semantic coincidences with the lexeme *annoyance* can be observed in the Germ. nouns *Verdruss*, *Gereiztheit,* and *Ärger*. At the same time, the Germ. noun *Ärger* is the closest to *annoyance* in its content*,* since *Gereiztheit* conveys mainly the semantics of irritation, which plunges a person into a negative and uncomfortable state (or mood), while *Verdruss* possesses not only the meaning of a long-term dissatisfaction, but also the meanings expressing higher arousal of anger compared to *annoyance*; (5) the Germ. noun *Wut* is semantically closer to the Engl. word *anger* though it is not its complete equivalent as it has a higher anger arousal and occupies the position

between *anger* and *rage* on the arousal scale. Nevertheless, the semantics of *Wut* shows more coincidences with *anger* than with *rage*.

The analysis of mono- and bilingual dictionaries makes it possible to determine, firstly, significant though not complete equivalence of the lexemes *annoyance* – *Ärger* and *anger* – *Wut*. It is in line with scholars' opinion that it is the Germ. noun *Wut* rather than *Ärger* or *Groll* that is equivalent to the Engl. lexeme *anger* (Ogarkova et al. 2012: 268; cf. also: Durst 2001: 138; Fries 2004: 10–11). It may be partially confirmed by the conclusion that *Ärger* represents the group of low-power/passive anger-like emotions while *Wut* belongs to high-power/active ones (Soriano et al. 2013: 351). Secondly, this analysis also revealed that the Germ. noun *Wut* is not the most accurate equivalent of the Engl. lexeme *rage*. It remains unclear why translators have neglected (cf. the above variants of translating "the anger petal" into German) the Germ. word *Zorn*. The latter is interchangeable with *Wut* in most contexts (Durst 2001: 131), though it is to a greater extent characterized by the semantics of a very strong anger and fury (DWDS), which makes it closer to *rage* in terms of arousal. Considering this, *annoyance* – *Ärger*, *anger* – *Wut*, *rage* – *Zorn* can be identified as incomplete though most exact German equivalents for the three anger-like words represented on the English "anger petal". At the conceptual level, this conclusion makes it possible to identify tentatively the following cross-cultural equivalents: ANNOYANCE – ÄRGER, ANGER – WUT and RAGE – ZORN.

Thus, the equivalents identified through the study of the definitions of the analysed anger-like words in representational English and German dictionaries in some cases differ from the given above author's – "naïve" – English-German translations of the anger "petal". The inaccuracy in rendering the designations of emotions can be apparently explained by the superficial study of the dictionaries. The translators having a good command of the source and target languages might be rather overconfident and trust their intuition too much. Anyway, neglect of the proper study of the dictionary definitions of language units in the process of translation results in inaccurate identification of interlingual equivalents.

3.2. Refining the results of the definitional analysis by determining the cultural relevance of the ECs ANNOYANCE, ANGER, and RAGE and their German equivalents

It should be noted that when the results of the definitional analysis do not make it possible to determine unequivocally the equivalence of particular language units, one can apply a very simple procedure – the

comparison of their frequency data with the aim of "weeding out" the cases where a rare (low frequency) and stylistically limited (high/low flown, archaic etc.) word of the target language may be defined as an equivalent for the actively used (high frequency) and stylistically neutral word of the source language. Such equivalence is not entirely correct. The example of this is the afore-mentioned Germ. lexeme *Groll,* which has quite noticeable semantic coincidences with the Engl. *anger*. However, these lexemes are only partial equivalents as the functioning of *Groll* in German culture is stylistically limited due to its high stylistic marking. It results in a considerably lower frequency of the lexeme *Groll* compared to *anger*. Contrast is also added by the fact that the frequency of the latter is much higher than that of other English terms denoting anger (Kövecses et al. 2015: 343).

If extrapolated to the conceptual level, high or low frequency of ECs denotations points to cultural relevance (topicality/prevalence) or irrelevance (out-of-datedness/rarity) in a definite culture. When studying relevant ECs in a source culture, it is methodologically correct to consider primarily relevant ECs in the target culture, relevance/irrelevance of ECs can therefore be considered one of the criteria of cross-cultural equivalence. In our case it means the following: the relevance level of Germ. ECs ÄRGER, WUT, and ZORN at least to some extent has to be commensurate with Anglo-Am. ECs ANNOYANCE, ANGER, and RAGE. The existence of such commensurability is indicated, firstly, by the results of the studies showing that *Ärger*, *Wut*, and *Zorn* are the most frequent lexemes conveying anger in German (Durst 2001; Oster 2018; Ogarkova, Soriano, 2023), secondly, by the data in the diagrams of frequency of the analysed lexemes (see Fig. 2 and Fig. 3) formed on the basis of online service Google Books Ngram Viewer (GBNV). These diagrams clearly show a much higher frequency of ECs ANGER and WUT compared to ANNOYANCE, RAGE, ÄRGER, and ZORN. The fact that the concepts ANGER and WUT are quite commensurate in their cultural relevance can support the above opinion concerning their equivalence. The same is true of ECs ANNOYANCE – ÄRGER and RAGE – ZORN, whose level of cultural relevance greatly coincides.

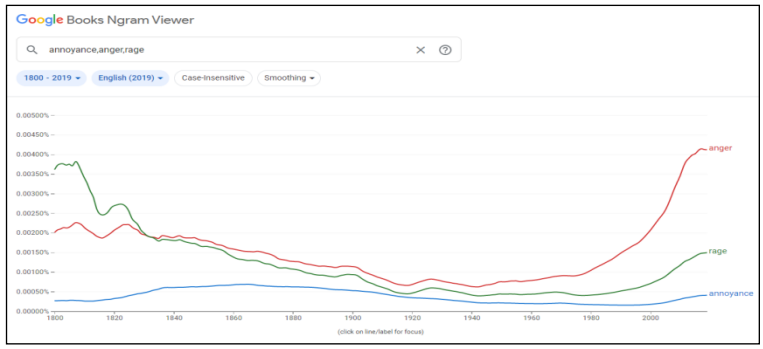

Figure 2: Diagram of frequency of lexemes *annoyance*, *anger*, and *rage*; English; 1800–2019; smoothing 3 (GBNV, 2023)

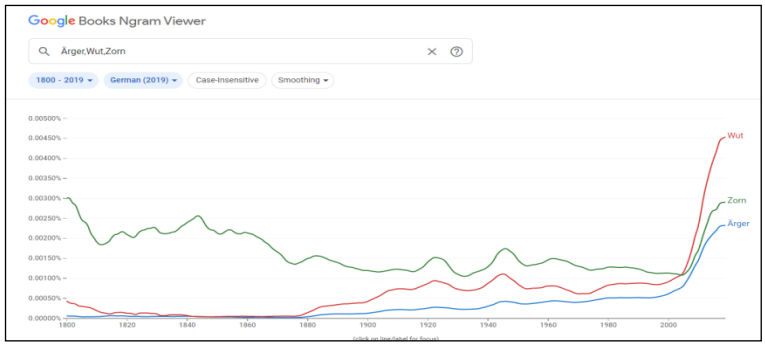

Figure 3: Diagram of frequency of lexemes *Ärger*, *Wut*, and *Zorn*; German; 1800–2019; smoothing 3 (GBNV, 2023)

3.3. Verifying the results of the first and second stages on the basis of arousal indicator of emotional proximates of analysed ECs

Language corpora make it possible not only to obtain objective data concerning cultural relevance of ECs but also to identify the most important senses of the latter. The senses contained in a cultural concept result from its interaction with other concepts. Each sense is actually "an imprint" left by this or that concept on the concept it interacts with. Therefore, senses perform the function of concept connectors: the more relevant the sense in a particular concept, the closer the connection of the latter with the concept representing this sense. At the language level, the relevance of concepts senses, as mentioned above, is determined on the basis of frequency of occurrences of those query words that are the designations of these concepts. In the terminology of this article, the most important connecting senses are called proximates.

In the following tables the relevance of the compared ECs is determined on the basis of the indicators of frequency of CPs (F), i.e. of those lemmas (occurrence forms) that objectify them, e.g.: *frustration* – 6223 (ANGER); *Frust* – 146 (ÄRGER). However, an important role belongs not only to the indicators of frequency but also to correlation strength that is calculated on the basis of association measures (typical compatibility) of the collocates. It is about the frequency of joint occurrence of the collocation elements that is determined in each corpus with the help of one or even several indices. The fact that iWeb uses MI-index while DWDS uses logDice with different formulas for their processing is not essential for this research since the indicators of correlation strength serve here only for "weeding out" non-typical collocations.

Table 1: Indicators of frequency (F≤40) and MI-index (MI≤4.0) of the lemmas objectifying the CPs of concepts ANNOYANCE, ANGER, and RAGE (iWeb corpus data)

ANNOYANCE	F	MI	ANGER	F	MI	RAGE	F	MI
frustration	393	7.87	*frustration*	6223	8.02	*anger*	1595	6.69
inconvenience	391	7.33	*sadness*	2775	8.24	*frustration*	584	5.24
nuisance	211	6.45	*resentment*	2637	9.01	*fury*	531	6.48
anger	176	5.29	*hatred*	1768	7.18	*grief*	493	5.57
irritation	160	6.21	*rage*	1595	6.69	*hatred*	457	5.86
embarrassment	103	6.49	*grief*	1310	6.35	*jealousy*	407	6.79
confusion	102	4.10	*bitterness*	1154	7.90	*despair*	337	6.06
disgust	43	6.08	*aggression*	937	6.52	*sadness*	277	5.54
distress	77	4.83	*jealousy*	890	7.29	*hate*	254	4.55
disturbance	70	5.15	*wrath*	701	6.26	*resentment*	230	6.12

Table 2: Indicators of frequency (F≤20) and logDice-index (ID≤4.0) of the lemmas objectifying the CPs of concepts ÄRGER, WUT, and ZORN (DWDS corpus data)

ÄRGER	F	ID	WUT	F	ID	ZORN	F	ID
Wut 'anger'	208	7.5	*Verzweiflung* 'despair'	900	9.5	*Wut* 'anger'	196	7.8
Enttäuschung 'disappointment'	176	6.8	*Enttäuschung* 'disappointment'	860	8.6	*Trauer* 'grief; sorrow'	160	7.8
Frust 'frustration; irritation'	146	8.4	*Trauer* 'grief; sorrow'	699	9.6	*Enttäuschung* 'disappointment'	152	6.5
Freude 'pleasure'	114	5.6	*Hass* 'hate'	640	8.5	*Verzweiflung* 'despair'	151	7.2

Verdruss 'anger; displeasure; resentment'	86	8.3	*Angst* 'fear; worry'	496	6.2	*Eifer* 'enthusiasm; zeal'	137	7.8
Stress 'stress'	66	6.9	*Empörung* 'indignation; outrage'	438	8.0	*Hass* 'hate'	134	6.5
Zorn 'rage'	55	6.2	*Zorn* 'rage'	326	8.1	*Empörung* 'indignation; outrage'	121	6.3
Frustration 'frustration'	45	7.4	*Frust* 'frustration; irritation'	255	8.5	*Verachtung* 'contempt'	73	7.2
Aufregung 'excitement'	31	4.9	*Frustration* 'frustration'	221	8.7	*Schmerz* 'pain'	71	5.8
Verwirrung 'confusion'	24	6.1	*Ärger* 'annoyance; anger; trouble'	215	6.7	*Ärger* 'annoyance; anger; trouble'	55	4.9

The data of the language corpora greatly confirm the GBNV online-service diagrams of frequency (Fig. 2 and Fig. 3) concerning the level of cultural relevance of the analysed ECs, since CPs representing ANGER and WUT have the highest indicators of frequency. They are located in the middle of "the petal" conveying to the greatest extent the senses of the basic properties of the emotion of anger. "Non-basic" ECs RAGE – ZORN and ANNOYANCE – ÄRGER show noticeably lower relevance. The data in the tables also demonstrate the semantic closeness of the denotations of ECs ANNOYANCE, ANGER, and RAGE as evidenced by the presence of "duplicating" sense in their conceptual structure (cf. 'anger' in ANNOYANCE and RAGE; 'rage' in ANGER). This closeness makes it possible to interchange these ECs designations in certain contexts. It is noteworthy that Germ. ECs ÄRGER, WUT, and ZORN are even closer in terms of content since each of these ECs contains not one "duplicating" basic sense but two (cf. 'Wut', 'Zorn' in ÄRGER; 'Zorn', 'Ärger' in WUT; 'Wut', 'Ärger' in ZORN).

As mentioned in the methodological part of this research, emotions are located on "the petals" of Plutchik's model according to the criterion of intensity (arousal), that is why it is reasonable to verify the results of the above analysis on the basis of the indicator of arousal of those lemmas in our sample that objectify basic CPs of the compared ECs (Tables 3 and 4).

Table 3: Indicators of arousal (A.) of the most relevant emotion CPs of concepts ANNOYANCE, ANGER, and RAGE

	ANNOYANCE	A.	ANGER	A.	RAGE	A.
1	FRUSTRATION	5.61	FRUSTRATION	5.61	ANGER	7.63
2	INCONVENIENCE	4.49	SADNESS	4.13	FRUSTRATION	5.61
3	NUISANCE	4.49	RESENTMENT	6.83	FURY	8.23
4	ANGER	7.63	HATRED	6.66	GRIEF	4.78
5	IRRITATION	5.76	RAGE	8.17	HATRED	6.66
6	EMBARRASSMENT	5.87	GRIEF	4.78	JEALOUSY	6.36
7	CONFUSION	6.03	BITTERNESS	6.53	DESPAIR	5.68
8	DISGUST	5.42	AGGRESSION	5.83	SADNESS	4.13
9	DISTRESS	6.40	JEALOUSY	6.36	HATE	6.66
10	DISTURBANCE	5.80	WRATH	8.23	RESENTMENT	6.83
$\bar{x}$		**5.75**		**6.31**		**6.26**

Table 4: Indicators of arousal (A.) of the most relevant emotion CPs of concepts ÄRGER, WUT, and ZORN

	ÄRGER	A.	WUT	A.	ZORN	A.
1	WUT	7.63	VERZWEIFLUNG	5.72	WUT	7.63
2	ENTTÄUSCHUNG	4.92	ENTTÄUSCHUNG	4.92	TRAUER	4.81
3	FRUST	5.61	TRAUER	4.81	ENTTÄUSCHUNG	4.92
4	FREUDE	5.74	HASS	6.66	VERZWEIFLUNG	5.72
5	VERDRUSS	5.38	ANGST	7.12	EIFER	6.89
6	STRESS	6.12	EMPÖRUNG	6.83	HASS	6.66
7	ZORN	8.17	ZORN	8.17	EMPÖRUNG	6.83
8	FRUSTRATION	4.60	FRUST	5.61	VERACHTUNG	5.41
9	AUFREGUNG	6.03	FRUSTRATION	4.60	SCHMERZ	7.12
10	VERWIRRUNG	5.55	ÄRGER	6.49	ÄRGER	6.49
$\bar{x}$		**5.98**		**6.15**		**6.25**

The study of the indicators of arousal of basic emotion CPs representing ECs ANNOYANCE, ANGER, and RAGE has revealed that in the conceptual structure of EC ANNOYANCE one can clearly trace the tendency towards the predominance of senses conveying low arousal of anger expression, e.g.: NUISANCE, IRRITATION, DISTURBANCE. At the same time, six out of ten CPs representing EC ANGER show high arousal level: RESENTMENT, HATRED, RAGE, BITTERNESS, JEALOUSY, and WRATH. It indicates that ANGER can convey strong manifestations of the emotion of anger depending on the situation. Like ANGER, EC also has six intensive CPs, but the average arousal indicator is lower (cf. ANGER $\bar{x}$ =6.31; RAGE $\bar{x}$ =6.26). It creates the impression that RAGE is less intense than ANGER. However, firstly, comparing the arousal of the first three proximates of EC ANGER and RAGE

it is possible to notice that the latter concept conveys a more intense manifestation of anger compared to the former, and secondly, EC RAGE has a closer connection of anger with fury and hatred (FURY, HATRED, HATE), than ANGER.

The analysis of the arousal indicators of basic CPs representing Germ. ECs ÄRGER, WUT, and ZORN made it possible to determine that the least intense manifestation of anger is conveyed by EC ÄRGER, since its conceptual structure has only two high intense CPs – WUT and ZORN. Besides, the intensity of the latter is reduced by CPs ENTTÄUSCHUNG, FRUSTRATION, that have low indicators of arousal and positively FREUDE. This fact proves the above-mentioned opinion that it is Germ. ÄRGER that is the equivalent to Anglo-Am. EC ANNOYANCE. However, this equivalence is incomplete as ÄRGER demonstrates not only certain differences in content compared to ANNOYANCE (cf. the absence of the senses of disgust, embarrassment, inconvenience or the presence of the sense of joy in it), but it also contains a greater number of intense senses (cf. ANNOYANCE $\bar{x}$ =5.75; ÄRGER $\bar{x}$ =5.98). It has been also revealed that EC WUT significantly overlaps the semantic volume of both ÄRGER and ZORN. It is explained, on the one hand, by the "middle" (basic) status of this anger-like emotion, and on the other hand, by the relevance of this EC for the representatives of the German linguistic community. However, the comparison of arousal of the first three CPs of the concepts WUT and ZORN makes it possible to state that ZORN conveys a more intense manifestation of anger (cf. also: WUT $\bar{x}$ =6.15; ZORN $\bar{x}$ =6.25). At the same time, the semantic structure of EC WUT greatly coincides with Anglo-Am. ANGER, while ZORN coincides with RAGE. Thus, RAGE and ZORN are the most intense ECs (the centre of "the flower"), ANGER and WUT are less intense (the middle of "the petals"; basic emotions), and ANNOYANCE and ÄRGER are the least intense (the periphery of "the petals").

4. Conclusions

The article develops a three-stage methodology by which the equivalence of language designations of emotion concepts (ECs) ANNOYANCE, ANGER, and RAGE is clarified since there are discrepancies in the German translations of emotion model by R. Plutchik while reproducing these designations. The first stage of this methodology involved the analysis of the definitions of those lexemes that are most frequently used by translators for conveying the English variant of "anger" petal in Plutchik's emotion model into German. This stage made it possible to "sift out" false cases of equivalence and to identify those German lexemes that most fully reflect the semantics of the English nouns *anger*, *annoyance*,

and *rage.* At the second stage of the tested methodology, the results of the definitional analysis were refined by determining cultural relevance of ECs ANNOYANCE, ANGER, and RAGE and their German equivalents. The identification of the cultural relevance of the latter relies on the frequency diagram of Google Books Ngram Viewer online service and the data of two study samples. It has been determined that the results of studying the indicators of sample units greatly coincide with the diagram data in GBNV online service concerning cultural relevance of ECs. Thus, the highest frequency indicators are characteristic of CPs representing ECs of Anglo-Am. ANGER and Germ. WUT. The latter are located in the middle of "the petal" conveying to the greatest extent the senses of the basic properties of the emotion of anger. Significantly lower relevance is demonstrated by "non-basic" ECs RAGE – ZORN and ANNOYANCE – ÄRGER. At the third stage, the results of the first and second stages were verified on the basis of arousal indicator of basic CPs contained in the conceptual structure of Anglo-Am. ECs ANNOYANCE, ANGER, and RAGE and Germ. ÄRGER, WUT, and ZORN. It has been found that RAGE and ZORN are the most intense ECs (the centre of "the flower"), ANGER and WUT are less intense (the middle of "the petals"; basic emotions) and ANNOYANCE and ÄRGER are the least intense (the periphery of "the petals").

It means that the results obtained from the analysis of designation definitions of Anglo-Am. ECs ANNOYANCE, ANGER, and RAGE and their German equivalents are consistent with the results of these ECs study according to the criteria of relevance and arousal. In general, the conducted analysis can be a fairly objective basis for the conclusion that in connection with ECs ÄRGER, WUT, and ZORN the representatives of the German speaking culture have the associations similar to those that arise in the English speaking communities in connection with ECs ANNOYANCE, ANGER, and RAGE.

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VERWENDUNG VON KORPUSDATEN IN DER ENGLISCH-DEUTSCH ÜBERSETZUNG: EINE FALLSTUDIE ZU KONZEPTEN FÜR WUTÄHNLICHE EMOTIONEN IN VERWANDTEN KULTUREN

Der Artikel entwickelt eine dreistufige Methodik zur Klärung der Äquivalenz der sprachlichen Bezeichnungen der Emotionskonzepte (E-Konzepte) ANNOYANCE, ANGER, and RAGE, da es in den deutschen Übersetzungen des Emotionsmodells von R. Plutchik Diskrepanzen bei der Vermittlung dieser Bezeichnungen gibt. Die Erprobung der Methodik umfasste die folgenden Schritte: 1) Definitionsanalyse („Aussieben" falscher Äquivalenzfälle und Identifizierung derjenigen Lexeme im Deutschen, die die Semantik der englischen Substantive *anger*, *annoyance* und *rage* wiedergeben); 2) Verfeinerung der Ergebnisse der Definitionsanalyse durch Bestimmung der kulturellen Relevanz der E-Konzepte ANNOYANCE, ANGER und RAGE und ihrer deutschen Äquivalente (Verarbeitung der Häufigkeitsdiagramme des Online-Dienstes Google Books Ngram Viewer und der Indikatoren der häufigsten Kollokate der Suchwörter *anger, annoyance, rage, Ärger, Wut* und *Zorn* sowie Ermittlung der Emotionsproximate dieser E-Konzepte); 3) Überprüfung der Ergebnisse des ersten und zweiten Schrittes anhand der Intensität der Proximate der untersuchten E-Konzepte. Auf diese Weise konnte festgestellt werden, dass hinsichtlich (a) des Inhalts, (b) der kulturellen Relevanz und (c) der Intensität eine gewisse Äquivalenz der E-Konzepte ANGER – WUT, RAGE – ZORN und ANNOYANCE – ÄRGER nachweisbar ist. Dies bedeutet, dass die E-Konzepte ÄRGER, WUT und ZORN bei Vertretern der deutschsprachigen Kultur ähnliche Assoziationen hervorrufen, wie sie im englischsprachigen Umfeld im Zusammenhang mit den E-Konzepten ANNOYANCE, ANGER und RAGE entstehen.

Schlüsselwörter: wutähnliches Emotionskonzept, Englisch, Deutsch, Übersetzung, Äquivalenz, Semantik, Sprachkorpus