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## Features of Speech Reactions to Mental State Concepts

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### Abstract

The article is devoted to the problem of mental state associative speech representation. The study involved 31 Russian-speaking subjects (27 females and 4 males) at the age of 18 - 22 years old. The experimental procedure using DMDX program allowed to measure the time of speech response to stimuli - the concepts of 25 mental states. The average reaction time to the concepts of mental states, shown on the computer monitor, made 2114.68 milliseconds. The most rapid associative speech response was the response to the following stimuli: "ecstasy" (1452.54 msec), "meditation" (1569.26 msec), "tranquility" (1685.21 msec), the slowest response is the response to "interest" (2517.5 msec) and "indecision" (2454.63 msec). In total, 448 associations were given to the concepts of 25 mental states by tested subjects - speech reactions, i.e. 17.9 associations per mental state on the average. The greatest number of speech associations (24) was given to the concept of love. The smallest number was given to the concept of ecstasy (11 associations). Associative fields of mental states (meditation, ecstasy, melancholy, tiredness, loneliness) have the most pronounced core. The prospects of the study consist in the performance of a similar associative experiment among the representatives of another culture, as well as in the studying of an estimated and situational associative representation of mental states.

**Keywords:** Associative representation, Mental state, Associative experiment, Speech reaction.

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## **Introduction**

Associative studies have a long tradition in a number of humanities. Quite a lot of research is carried out using the associative experiment method, both a directional and a free one in psychology, sociology, linguistics and psycholinguistics (Abramov, 2001; Gorodetskaya, 2002; Goroshko, 2001; Martinovich, 1990; Morozova, 2001; Pautova, 2007).

An associative experiment is traditional one, when participants need to give their associations to certain concepts in writing. Much less number of studies is performed in which oral associations are studied, as well as the oral associations obtained in the course of a psycholinguistic experiment conducted in terms of time shortage.

The study of psychic phenomena associative representation (and, above all, emotions and mental states) is of great scientific interest. There are studies in psychology when the question is raised concerning the structure of knowledge organization about emotions, the development of this knowledge during ontogenesis, the representation of emotions at various levels of consciousness (Dorfman, 1997), the level organization of mental state representations, and their linguistic features (Alekseeva, 2015a, 2015b, 2016), etc. However, the need to study the problem of the relationship between universality and specificity in associative representations of mental states is obvious. After all, the states are the most individual and subjective phenomenon of the psyche, and the identification of universal and specific components in their representations can demonstrate important patterns in the development of associative representation structure about the world as a whole and about oneself.

The study of associative speech representation of mental states is the goal of the present study. The tasks were, first of all, the reconstruction of the associative fields of mental states and, secondly, the determination of associative speech response time to visually presented stimulus words, which were represented by the names of mental states. The novelty of the study consisted in the use of an experimental procedure that allows one to measure the time of the speech response to the presented stimuli with a high accuracy.

## **Materials and Methods**

The study involved 31 students from Kazan (Volga region) Federal University (27 females and 4 males) at the age of 18 to 22 years.

An associative experiment was performed, which was developed on the basis of DMDX program and which makes it possible to measure the time of the speech reaction within millisecond accuracy (Forster & Forster, 2003).

The instruction for the probands was presented in a printed form on a sheet of paper and was the following one: "Good afternoon, dear research participant! Our research is of an associative nature. We deal with the associations that cause mental states. The monitor screen will show you the names of mental states. Your task is to name the first association to this concept that came to mind as quickly as possible. Before the presentation of this or that mental state name, a cross appears on the screen to fix your attention. It is a sign for you that you need to concentrate. Answer as quickly as possible do not hesitate for a long time. Do not be guided by anyone in your answers. There are no good or bad answers. Thank you very much for your cooperation!"

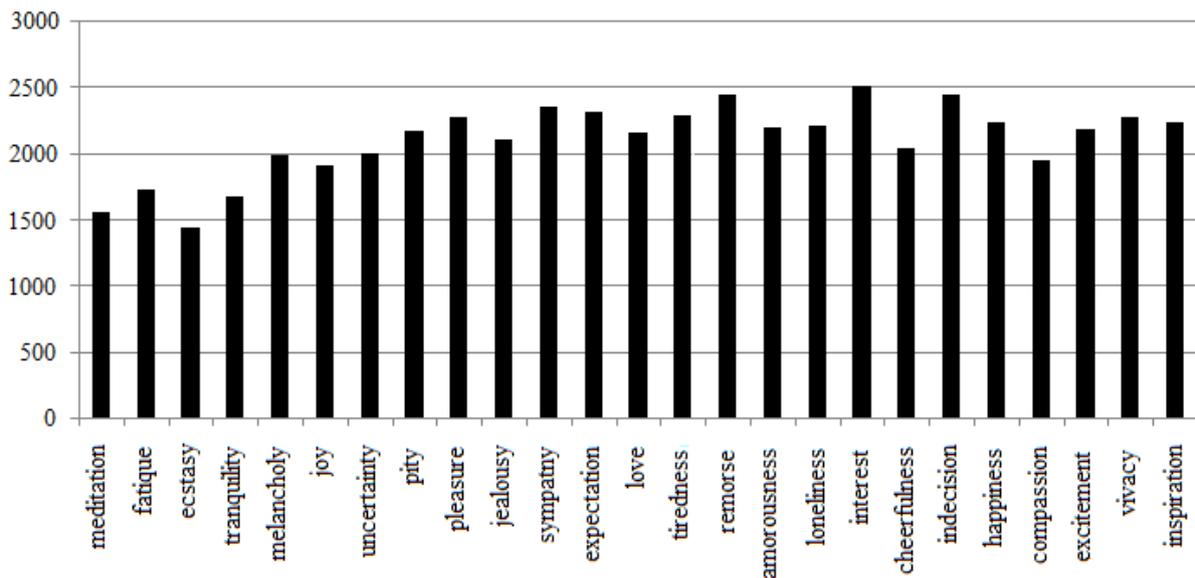
Thus, in the course of the experiment, test subjects were asked to name the associations caused by the stimuli presented on the computer monitor. The stimuli were represented by the names of mental states: meditation, fatigue, ecstasy, tranquility, melancholy, joy, uncertainty, pity, pleasure, jealousy, sympathy, expectation, love, tiredness, remorse, love, loneliness, interest, cheerfulness, indecision, happiness,

compassion, excitement, vivacity and inspiration. These states were selected not by chance, they were among the most typical ones for student life activity (Aleksееva, 2016).

Respondents' answers were analyzed relative to the reaction time using the CheckVocal program (Protopapas, 2007).

## Results and Discussion

The average reaction time to stimuli (names of mental states), presented on the computer monitor, was 2114.68 milliseconds. The reaction time for each individual stimulus (the concept of a mental state) is shown on Figure 1.



**Fig. 1.** The average reaction time to the stimuli – names of mental states (in milliseconds)

According to Figure 1, the most rapid one was the associative speech response to the stimuli "ecstasy" (1452.54 msec), "meditation" (1569.26 msec), "tranquility" (1685.21 msec), "fatigue" (1732.55 msec), "joy" (1912.95 msec) and "compassion" (1954.03 msec). The speed of speech response to other stimuli was more than 2 seconds. The speech response to "interest" (2517.5 msec), "indecision" (2454.63 msec), "remorse" (2448.55 msec) was the slowest one.

Then, the speech reactions were subjected to qualitative analysis. The task was to reconstruct the associative fields. First, they analyzed the number of verbal reactions to the names of mental states which formed the nucleus, the perinuclear layers and the periphery of the associative fields. The core of mental state associative fields was formed by the most typical associations inherent in 30% of respondents at least. Perinuclear layers are the reactions representing the responses which occurred more than once. The periphery included single answers.

**Table 1.** The number of associative reactions to the stimuli – names of mental states

Mental state	Associative field core	Near-nuclear layers of the associative field	Associative field periphery	TOTAL
Meditation	1	4	7	12
Fatigue		9	11	20
Ecstasy	1	3	7	11
Tranquility		5	11	16
Melancholy	1	3	9	13
Joy		7	11	18
Uncertainty		3	20	23
Pity		7	8	15
Pleasure		4	15	19
Jealousy		7	13	20
Sympathy		7	11	18
Expectation		3	18	21
Love		5	19	24
Tiredness	1		14	15
Remorse		2	14	16
Amorousness		4	19	23
Loneliness	1	2	15	18
Interest		6	7	13
Cheerfulness		4	17	21
Indecision		3	13	16
Happiness		3	20	23
Compassion		6	12	18
Excitement		3	17	20
Vivacy		6	10	16
Inspiration		6	10	16
TOTAL	448 associations			

According to Table 1, the subjects presented 448 associations – verbal reactions to the concepts of 25 mental states, i.e. 17.9 associations for each of the 25 concepts of mental states on the average. The largest number of speech associations was given to the concepts of such mental states as love (24 different associations), the state of amorousness (23 associations), happiness (23 associations) and uncertainty (23 associations). The least number of associations was given to such mental state concepts as ecstasy (11 associations), meditation (12 associations), melancholy, interest (13 associations each), pity, tiredness (15 associations each).

The most pronounced nucleus is the associative fields of such mental states as meditation, ecstasy, melancholy, tiredness, loneliness (according to one speech association that characterizes the core of an associative field). The remaining (namely the majority) studied mental states do not have a clear core of an associative field.

The most filled near-nuclear layers of an associative field are such mental states as fatigue (9 associations), joy, pity, jealousy, sympathy (7 associations each). The least filled near-nuclear layers of an associative field are represented by such mental states as remorse, loneliness (2 associations each), ecstasy, melancholy, uncertainty, expectation, indecision, happiness, excitement (3 associations each). The state of tiredness is characterized by the absence of a near-nuclear layer of an associative field.

In general, the associative fields of mental states are characterized by a fairly densely filled periphery. The associative fields concerning the states of uncertainty and happiness (20 associations each), love and amorousness (19 associations each), expectation (18 associations each), cheerfulness and excitement (17 associations each) have the richest periphery. The states of ecstasy, meditation and interest (7 associations each), pity (8 associations) and melancholy (9 associations) have weakly represented periphery.

The obtained data allow to reconstruct the associative fields of the studied mental states. So, the associative field of the cognitive mental state "meditation" consists of the nucleus thought / thoughts (48% of respondents), a near-nuclear layer is filled by brain associations (6%), study (6%), exam (6%) and meditation (6%). The periphery is represented by such associations as books, reflections, a task, a couple, a wind and speculation.

Speech reactions to the concept of interest state, characterized by a cognitive and motivational component, revealed the following features: the near-nuclear layer was represented by interest (19%), attention increase / attention (15%), curiosity (11%), interesting work / work / scientific work (11%), a new film / film (11%) and a new subject / subject (7%). The periphery of the associative field was filled with doubt, study, enthusiasm, excitation and education.

When you analyze speech reactions to the concepts of mental states with a dominant physiological component, it was found that sleepiness / sleeping / drowsiness (22% of respondents), work (19%), lethargy (6%), laziness (6%), bed (6%), heaviness (6%) included the near core layer (the core is absent) of fatigue state associative field. The very word "fatigue" as a speech reaction entered the core of the associative field "tiredness" (36%). The core of the associative field for this concept also includes exams (10%) and sleep (6%).

The associative field of the "vivacity" state has a near-nuclear layer, which included the associations from morning (25% of respondents), gaiety (14%), energy / energy charge (10%), get up early morning (7%) and slept well (7%). The periphery was filled with activation, strength, happiness, health, a healthy sleep, exercise, energy, well, absence of exhaustion.

The associative fields of emotional psychic states are of great interest. So, the associative field of the mental state "ecstasy" consists of a fairly pronounced core filled with the association joy (40% of the

subjects). The perinuclear layer of the associative field is filled with the following associations: happiness (23% of respondents), holiday / happy holiday (6%), event / joyful event (6%). Periphery is represented by such associations as life, emotions, love, friends, new plans, fireworks.

Associative fields of the states "joy", "happiness" and "cheerfulness" reveal similar characteristics with the associative field of "ecstasy" state. The associative fields of these mental states do not have a uniquely expressed core. A near-nuclear layer of the "joy" state includes happiness (20%), the sun (10%), laughter (6%), delight (6%), gift (6%), meeting with friends (6%), holiday (6%), and the near-nuclear state of "happiness" is characterized by joy (20%), family (10%) and enthusiasm (6%).

The negative states of low level mental activity have their features. So, the associative field of "melancholy" state has the following characteristics: the core is formed by sadness (30%), the perinuclear layers include sadness (23%), tears (10%) and boredom (6%). Periphery is formed by the associations of frustration, road, loneliness, love and rain.

The state of uncertainty is characterized by the presence of an associative field near-nuclear layer, which included the associations of stiffness (10%), fear (10%), restraint (7%), examination (7%) and work (7%). Periphery was filled with doubt, irritation, frustration, anxiety, incomprehensibility, shyness, resentment, timidity, fear, imbalance, embarrassment, confusion, despair and weakness.

The state of loneliness is characterized by a clearly expressed core of the associative field, which included longing (30% of respondents). Tranquility (11%) and sadness (7%) developed a near-nuclear layer. The periphery was represented by sorrow, wolf, alone, rain, hostel, reading books, evening, no friends, the desire to be alone, old age, bad, empty room, silence and trouble.

## **Conclusion**

The average time of speech associative reaction to the names of mental states, which made 2114.68 milliseconds, is much larger than the reaction time found in various psycholinguistic studies, the task of which was to name the stimuli presented on the computer monitor in the form of individual words, connected phrases or entire sentences (Mädebach et al., 2011).

According to the data obtained, it became possible to reconstruct the associative fields of the studied mental states, to describe their qualitative characteristics and features. Speech reactions to the names of mental states can develop a nucleus (the most typical associations), near-nuclear layers and the periphery of associative fields. The nucleus and the perinuclear layers do not have all the associative fields of mental state concepts, while a fairly densely populated periphery is characteristic for most associative fields of mental states.

This research, which made it possible to study the quantitative and qualitative features of speech associative reactions to the names of mental states, contributes to the development of a structural-level model of mental state representations.

The prospects are to conduct a similar associative experiment among the representatives of another culture. Besides, the studies of mental state estimated and situational associative representation would also be interesting.

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