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При поддержке

ПРАВИТЕЛЬСТВА КАЛИНИНГРАДСКОЙ ОБЛАСТИ
ИНСТИТУТА ПСИХОЛОГИИ РАН
ИНСТИТУТА ЯЗЫКОЗНАНИЯ РАН
МОСКОВСКОГО ГОСУДАРСТВЕННОГО УНИВЕРСИТЕТА ИМЕНИ М.В.ЛОМОНОСОВА
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Пятая международная конференция по когнитивной науке: Тезисы докладов:
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Настоящий сборник включает материалы Пятой международной конференции по когнитивной науке / The Fifth International Conference on Cognitive Science, состоявшейся в Калининграде, 18–24 июня 2012 г.

Конференция посвящена обсуждению вопросов развития познавательных процессов, их биологической и социальной детерминированности, моделированию когнитивных функций в системах искусственного интеллекта, разработке философских и методологических аспектов когнитивных наук. В центре дискуссий были проблемы обучения, интеллекта, восприятия, сознания, представления и приобретения знаний, специфики языка как средства познания и коммуникации, мозговых механизмов сложных форм поведения. Специализированные воркшопы были посвящены таким актуальным темам, как активное зрение и коммуникация, работа мозга при патологии, компьютерное моделирование, высшие когнитивные функции животных, процессы речепорождения, нейрокогнитивные механизмы языкового поведения, принятие решений. Материалы представляют собой тезисы лекций, устных и стендовых докладов, а также выступлений на воркшопах. Все тезисы прошли рецензирование и были отобраны в результате конкурсной процедуры. Они публикуются в авторской редакции.

В электронном виде эти материалы представлены на сайте конференции (www.conf.cogsci.ru), а также на сайте Межрегиональной ассоциации когнитивных исследований (www.cogsci.ru).

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stop an automatic reaction of following the cue and engage attentional control to direct their gaze to the opposite side of the visual field.

Two types of neutral stimuli (social vs nonsocial) were used in the study. Social cues (neutral faces) were taken from the NimStim Face Stimulus Set (http://www.macbrain.org). To measure the trait anxiety the STAI2 Intentory was used (Spielberger, Gorsuch & Lushene 1983).

According to the attentional control theory (Eysenck et al. 2007) the authors expected that subjects with high level of trait anxiety (Spielberger, Gorsuch & Lushene 1983) would achieve lower accuracy of performance in the condition that requires attentional control („antisaccade condition"), while they would achieve higher accuracy of performance in the condition that requires only automatic reaction („prosaccade condition").

Results

In order to analyze the data, the mixed model was implemented. The analysis reavealed that the higher the trait anxiety level in the prosaccade condition, the lower accuracy for neutral cues. In the antisaccade condition we found that higher trait anxiety level was accompanied by higher accuracy for neutral stimuli. The authors replicated the results using two different types of neutral stimuli – social and nonsocial.

Conclusions

These results do not support the attentional control theory, sugesting that trait anxiety could affect the attentional control only under certain conditions. We claim that attentional control theory, although generally accepted, is too specific to explain all the anxiety-related cognitive problems. At the moment the authors are trying find a new framework that would allow them to explain these findings.

Future studies

The authors aim to conduct further research with other types of cues, and with the use of eye-tracking tools that would provide more precise measure of attentional control.

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LEARNING AND PERFORMING THE TASK WITH CLOSED AND OPEN EYES IN RATS AND HUMANS

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Organisms have specific abilities allowing them to use different parameters of the environment for satisfying their needs and achieving adaptive outcomes. Vision, as one of these abilities, provides the faculty for using certain optic parameters of the environment in new experience acquisition and behaviour organization. If vision is limited, organisms are still often capable of satisfying their needs and achieving necessary outcomes. However, learning and behaviour are usually complicated without vision. This work is focused on studying how individuals with an intact visual system and normal visual development deal with a familiar task and learn a new task in the absence of visual contact with the environment. As ecological significance of vision varies among species, one of the questions we put here was: can any specificity be observed in behavioural dynamics of learning without vision by humans, who use vision widely, as opposed to rats, whose need for vision in solving their evolutionary problems is not so crucial as for other senses?

We used two experimental models of cyclic behaviour; one for rats (Experiment 1) and one for humans (Experiment 2). In both models, Group 1 had to learn the task with closed eyes and Group 2 with open eyes. After the task had been acquired, its performance was studied in three experimental stages, or conditions. For Group 1, the sequence of stages was closed-open-closed eyes, and for Group 2, open-closed-open eyes. Mann-Whitney U Test was used to compare samples and Wilcoxon match

pairs test was used to compare between stages within the same sample, significance level p<0,05.

In **Experiment 1** two groups of rats (n=27) learnt an instrumental lever-press task in an operant chamber without guiding by an experimenter. Rats from Group 1 were placed into the chamber with eyes covered by light-proof spectacles. They had not seen this chamber before so they could not use optic parameters of this environment to learn the task. Light-proof spectacles were used only in the chamber (30 min per day). Rats from Group 2 could see the chamber during learning. We recorded visual EP to control the quality of the eye covering and EEG during the instrumental behavior performance over the motor, retrosplenial and visual cortices.

In **Experimant 2** human participants (n=16) learnt a spatial task which was presented as a game. During this game participants could learn to collect and accumulate points navigating with their fingers around a playing field. The playing field was composed of certain size squared black keys. Every key press was accompanied with a sound. Navigating around the playing field according to the sound feedback, subjects found a sequence of moves which brought them points. Thus, to accumulate points they had to repeat this sequence of moves. Similar to Experiment 1, participants comprised two groups: Group 1 learnt the task wearing a blindfold and Group 2 learnt the task with open eyes.

These experiments showed that in neither rats nor humans the absence of visual contact with the environment affected the time required to learn the tasks. After training, both humans and rats with open eyes performed the task faster compared to those with closed eyes. The dynamics of the task performance with closed and open eyes in the three experimental stages depended on the learning conditions (see Fig 1). As it could be predicted, the speed of the task performance displayed by rats and human participants from Group 2 decreased when they had their eyes closed during the second stage and then increased again when they had open eyes during the third stage (Fig.1 B, D). Participants from Group 1 showed the opposite dynamics, they performed the task slower with closed eyes during the first experimental stage, faster with open eyes during the second stage and slower again during the third stage (Fig.1 C). Unlike humans, the only difference in the task performance found in rats from Group 1 was between the first and second experimental stages (Fig.1A); their performance could be described as more stable.

Interestingly, human participants from both groups increased the speed of the task performance during the third stage of the experiment compared to the first stage (Fig.1 C, D), and this phenomenon

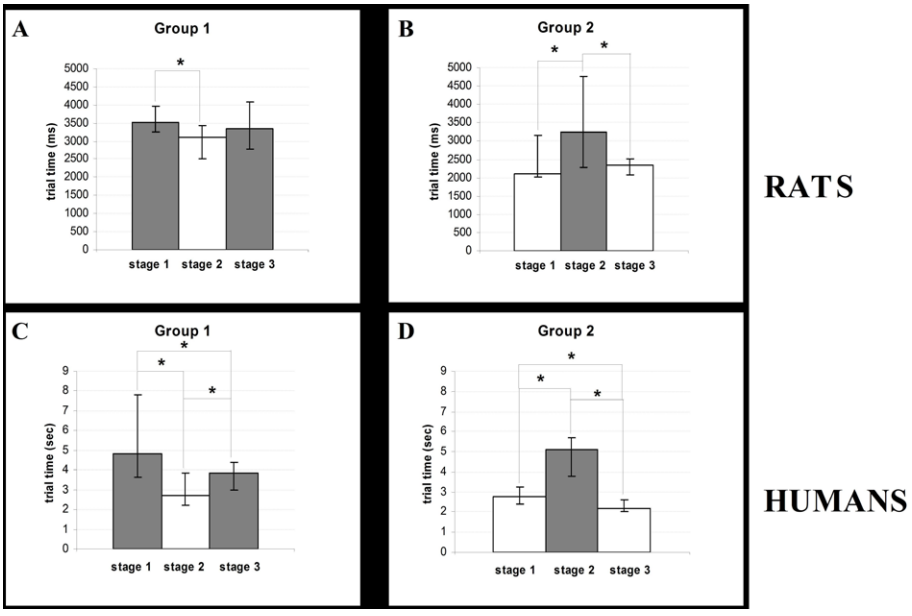

Fig.1. *Task performance in three experimental stages by rats (A, B) and humans (C, D). Group 1 initially leant the task with closed eyes and Group 2 learnt the task with open eyes. Dark bars indicate experimental stage, or condition, with closed eyes, light bars – open eyes. The sequence of the experimental stages for Group 1 was closed-open-closed eyes, and the sequence for Group 2 was open-closed-open. Wilcoxon match pairs test was used, p<0,05.*

was not observed in rats (Fig.1 A, B). This dynamics might be explained as a simple result of learning, but also it could reflect the effects of specific experience of the task performance in different conditions formed during the second experimental stage and general ecological importance of visual experience for humans. To test this possibility it is necessary to increase the samples and study control groups. These two requirements are currently in the process of answering.

Thus, it has been shown that individuals could learn a new task successfully regardless of whether they had visual contact with the environment or not, and this was the case for both rats and humans, whose visual abilities and ecological importance of vision are different. However, the dynamics of the task performance with closed and open eyes was different in individuals trained without vision compared to those who were free to use it; and this dynamics was specific for rats and for humans. These results could indicate that even if optic parameters of the environment are not so crucial to learn a task successfully, they can still be an important part of formation and realization of inward individual experience; and as visual abilities and their significance are higher in humans, their individual experience may be more affected by the absence of visual contact with the environment. The further analysis of learning and behaviour (such as trajectories of moves) as well as studying brain activity in these tasks may assist in a deeper understanding of the role of visual contact with the environment in formation and realization of individual experience.

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NARRATIVE PRODUCTION IN LITHUANIAN PRESCHOOLERS AND SCHOOL-AGE CHILDREN

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During the last decades, school-ages' literacy and general language development seems to become one of the most problematic areas. In Lithuania, as well as in other countries (Gardner et al. 2006, Topaj and Gagarina 2009), speech therapists, psychologists and teachers observe an increasing number of children with language disorders (SLI, dyslexia, etc.) or delay who need a speech therapy and/ or a help of so called special pedagogues. Although we still need a comprehensive statistic data about Lithuanian language impairments, one can observe that impaired phonology, grammar and narrative skills tend to complicate a whole process of learning (not languages only, but also other subjects), lead to low academic results and cause a learning demotivation. Thus Lithuanian language and literacy development has to be investigated in order to a) indicate typical development of Lithuanian spoken and written language, and b) to identify children, whose language may probably be impaired.

This paper deals with narrative discourse which is considered one of the most informative methods and/or tools for general language screening and assessment. The study was carried out in the framework of a national scientific project *Lietuvių vaikų kalba: įtakos ir tendencijos*[1]. The analysis is based on an experimental data of 72 Lithuanian typically developing monolingual children (6–11 years age) from middle class families, attending state kindergartens/ schools in Kaunas (Lithuania).

During the investigation, the children were tested individually; they were asked to tell a story according the *Cat Story* (Hickmann 1982) and the *Fox Story* (Gülzov and Gagarina 2007) picture sequences. The stories were recorded, transcribed and annotated for an automatic analysis using CHILDES (*Child Language Data Exchange System*, MacWhinney 2010) tools. During the analysis, a microstructure (syntactic complexity, lexical diversity, and general productivity) and a macrostructure (narrative structure, quantity of information, and coherence of text) of the stories were investigated[2].

1 Project "Lietuvių vaikų kalba: įtakos ir tendencijos" [Lithuanian children language: influences and tendencies] was coordinated by Vytautas Magnus University (Kaunas) and supported by a grant No. LIT-1–18 from the Research Council of Lithuania.
2 The study was based on a methodology developed during author's PostDoc studies (supported by a grant No. SF-PD-2010–08–10–0199 from the Research Council of Lithuania. I would like to express my deep gratitude to Prof. Dr. I. Dabašinskienė and Dr. N. Gagarina for their helpful comments on the methodology and interpretation of the results.