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Конференция посвящена обсуждению познавательных процессов, их биологической и социальной детерминированности, моделированию когнитивных функций в системах искусственного интеллекта, разработке философских и методологических аспектов когнитивной науки. Программа конференции включает серию специализированных воркшопов, посвященных таким актуальным темам, как возрастные особенности когнитивного развития, ментальные ресурсы разного уровня, движения глаз при чтении и мультимодальная коммуникация. Публикуемые материалы представляют собой тезисы пленарных лекций, устных и стендовых докладов, а также выступлений на воркшопах. В электронном виде эти материалы представлены на сайте конференции (cogconf.ru), а также на сайте Межрегиональной общественной организации «Ассоциация когнитивных исследований» (МАКИ, www.cogsci.ru).

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COMPLEMENTARITY OF HOLISTIC AND ANALYTICAL MENTALITIES AND TASK TYPE AS FACTORS OF COOPERATIVE PROBLEM SOLVING[1]

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Behavioral and psychophysiological studies show that the processes of problem-solving often differ in subjects with analytical (A) and holistic (H) thinking (Apanovich et al., 2016, Hedden et al., 2008, etc.). Moreover, such differences are observed in various forms of social interaction (Apanovich et al., 2018). The type of mentality (A/H) is considered as one of the key factors in cooperative decision-making (Fu et al., 2009; Woolley et al., 2010). We hypothesized (see Alexandrov, Alexandrova, 2010; Alexandrov, 2009, 2015) that subjects with different mentalities (A/H) could be complementary in achieving a common goal; and that manifestations of such complementarity may differ depending on the type of a task that needs solving, whether it is an analytical or holistic problem (Tishchenko et al., 2017).

The *aim* of our study was twofold: first, we intended to evaluate how complementarity of subjects' mentalities reflects in cooperative problem-solving; and, second, we aimed to analyze the mediating role of task type (holistic/analytical) in successful cooperation and problem solving in subjects with complementary mentalities.

Methods

The study included two experimental conditions. In "individual" condition,

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participants (N = 36, 18 women, mean age 20.8 years old) solved a set of selected tasks without social interaction. In "cooperative" condition, participants (N = 30, 23 women, mean age 19.2 years old) solved the same set of tasks in pairs. Participants within a pair (N = 15) were asked to work together and produce one joint decision for each of the problem.

Prior to experiments the participants completed the Analytic-Holistic Scale (AHS, see Apanovich et al., 2017) and Raven's Progressive Matrices, which was necessary for the formation of pairs with complementary (A+H) and non-complementary (A+A or H+H) mentalities, and with equivalent intelligence. The set of tasks included analytical (e.g., "Knights and Knaves", matching tasks and identification of essential features) and holistic (e.g., anagrams, moral dilemmas and finding associations) problems (see Tishchenko et al., 2017).

Results

We compared task performance between groups of complementary (N = 8) and non-complementary (N = 7) pairs of participants. The type of mentality (H or A) was identified on the basis of participants' AHS score: scores higher than the median value (Med = 111.5) were labelled as H and lower scores labeled as A. The results showed that complementary pairs (A+H) tended to come to decisions faster than non-complementary pairs (A+A and H+H).

In general, analytical tasks were solved faster in the individual condition than cooperative condition, while holistic tasks were solved faster in the cooperative condition than individual condition (Mann-Whitney test, $U = 48.0$, $Z = 3.87$, $p < 0.0001$). When solving anagrams and in analytical tasks, participants tended to make fewer mistakes in the cooperative condition than individual condition.

Discussion

Our previous studies demonstrated that subjects with holistic and analytical mentalities differ in how they solve various problems in cooperation with others and individually (Apanovich et al., 2018, 2016). In this work we demonstrated that analytical and holistic types of tasks are solved differently by pairs of individuals with complementary and non-complimentary types of mentality. These results correspond to the notions of the relationship between institutional matrices and types of mentality: holistic tasks are solved more successfully in cooperative condition, while analytical tasks are solved more successfully in individual condition (see Alexandrov, Kirdina, 2013).

Conclusion

Complementarity of mentalities and task type are important factors defining efficiency of cooperative problem-solving. We have shown that analytical

tasks are solved faster individually, while holistic tasks are solved faster in cooperation. A tendency toward a more efficient and successful problem solving was observed when holistic and analytical mentalities complemented each other. Overall, our results support the hypothesis about complementarity of types of mentalities for effective problem-solving. However, further analysis on an increased sample is required for a deeper understanding of the role of complementarity and task type in cooperation for successful problem-solving.

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