



**ИНСТИТУТ ПСИХОЛОГИИ  
РОССИЙСКОЙ АКАДЕМИИ НАУК**

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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](http://cogconf.ru)), а также на сайте Межрегиональной общественной организации «Ассоциация когнитивных исследований» (МАКИ, [www.cogsci.ru](http://www.cogsci.ru)).

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## CULTURAL SPECIFICITY OF LEARNING FOR ACHIEVEMENT OF GAIN AND AVOIDANCE OF LOSS<sup>1</sup>

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Psychophysiological research addresses bodily processes that correspond to psychological categories. That these categories are not universal is essential for social and cultural neuroscience (e.g. Alexandrov and Alexandrova 2007, Han et al. 2013, Saalasti et al. 2018), as well as for studies within systems psychophysiology (Alexandrov 2015, Shvyrkov 1986). The former has revealed that learning within cultures shapes individual perception, attention, emotional feelings, and other cognitive processes (or “functions”), as well as their brain underpinnings (e.g. Immordino-Yang and Yang 2017).

The latter, systems psychophysiology, defines function as achievement of a result, provided by a system of mutually cooperative elements (Anokhin 1974). Behavior is therefore considered as a manifestation of individual structure of the systems, formed during learning (Shvyrkov 1986). In other words, the nature of organism-environment interaction assembles what is called “functions”. Major part (if not all) of human interactions is social; results of individuals’ behavior are of importance to other members of a community. Therefore individual action is simultaneously a group action (Alexandrov and Alexandrova 2007). Consequently, it is natural for the human “functions” to be consistent with social categories.

One of the basic aspects in psychophysiological analysis of organism-environment interaction is emotion (Alexandrov and Sams 2005, Nummenmaa et al. 2012) exposed via motivational dimension – that of approach and avoidance (e.g. Carver 2006). The united concept of consciousness and emotion (Alexandrov 1999, Alexandrov and Sams 2005) holds that approach and withdrawal behaviors are subserved by units that belong to two domains of individual experience, characterized by positive and negative emotions, correspondingly. The “negative” domain is more complex, differentiated, contains more elements, and is characterized with more cognitive load, than the “positive” domain (e.g., Alexandrov et al. 2007, Roskes et al. 2013). Accordingly, achievement and avoidance goals are asymmetric (Alexandrov et al. 2007,

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Zhang et al. 2016), and they predict different performance improvements (Alexandrov et al. 2007, Sozinov et al. 2012, Yeo et al. 2008).

Learning transfer has been proposed to be socially and culturally determined (e.g. Pea 1987), because the “elements” perceived as common are not defined by the tasks, but extracted according to acquired categories. In line with the asymmetric domains hypothesis, we have earlier shown that the effect of prior experiences on new task performance differs between gain and loss contexts (Sozinov et al. 2012). The specificity of behaviors aimed at achievement or avoidance is also greatly influenced by social goals (Levontin and Bardi 2018). Therefore, we expect this effect to be mediated by cultural traits, including the style of thinking, which is linked to the achievement-avoidance motivation (Hamamura et al. 2009, Yamazaki 2005). Accordingly, the approach-withdrawal difference of performance speed appeared to be dissimilar in Russians compared to Finns (Sozinov et al. 2015).

Since the approach context enhances global attention focus, whereas the avoidance enhances the local one (see Calcott and Berkman 2015), we further propose that the gain and loss contexts would account for greater far and near transfer effects, correspondingly. Again, culture-specific motivation for learning is expected to mediate this difference.

Our present experimental evidence is in accord with this proposition. We used our A-ware program (Sozinov et al. 2018) to assess learning in two tasks that have various common features allowing for near and far transfer. The tasks were to find out the way to win using number of points as an indicator of correctness. The context of gain or loss was assigned randomly as a between-group factor. We manipulated it with the type of feedback, presented to the participants after each trial: either positive number of points that reflects gain compared to zero, or a negative number that reflects loss compared to maximum points.

In order to examine cultural specificity of learning in the context of gain or loss, we compared performance indices between groups of Chinese and Russian participants, known to differ in allocentrism-idiocentrism (Lynch et al. 2009). Although Chinese and Russian samples lack direct comparison with motivational and learning style measures and cannot be unambiguously described as “Eastern” or “Western” (<https://www.hofstede-insights.com/product/compare-countries/>), they presumably differ in traits that reveal approach and avoidance motivation (Chinese culture imposing more avoidance of failure, than Russian culture, due to lower individualism, see Elliot et al. 2001).

We compared time of completion a challenging task that required disclosing a new rule of the game. The Chinese participants had a tendency to complete this task faster in the loss context, than in the gain context (Mann-

Whitney  $U=11,0$ ;  $p=0,059$ ), whereas Russians revealed the opposite difference ( $U=3,0$ ;  $p=0,019$ ). This difference presumably reflects cultural specificity of approach-avoidance motivation, at least partly derived from cultural differences in definition of the self (Hamamura et al. 2009). Learning in the contexts of gain and loss may also differ in terms of self identification (Brewer 1991). If learning in experimental setup is perceived as a part of interaction with the experimenter, then the context of gain might appear as more inclusive (e.g., as assessment by an in-group), whereas the context of loss – as more distinctive (e.g., assessment by an out-group).

The pursuit of the unitary entities that underlie many interrelated variables like the degrees of brain area activation, emotionality or traits like individualism, self-construal, power distance, and potentially unlimited number of other dimensions, is an issue of psychophysiology and neuroscience. The explanatory basis for perceptual, mnemonic, motivational, and other aspects of human behavior in cognitive neuroscience is the formation and modification of cognitive structures (e.g. Tse et al. 2007). In more general terms, every individual is a collection of bodily-based experiences. Both social neuroscience and systems psychophysiology provide important contribution to the analysis of these structures by acknowledging that neuronal activity, that relates to events, regards individual history (Alexandrov et al. 2015).

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