Does language interfere with mentalising? : The role of language processing during the false-belief task

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Background

The development of menalising ability has been studied extensively using false-belief (FB) tasks. A typical FB task uses a scenario where the protagonist comes to hold a FB about an object because an unexpected transfer of the object had occurred during the protagonist's absence. At the end of the scenario, a child perceiver is asked where the protagonist goes to find the object. If the perceivers can correctly mentalise the protagonist's FB, then their response should indicate the location where the protagonist initially placed the object. Studies using this scenario suggest that passing this test signifies the acquisition of an explicit form of theory-of-mind, which can be observed when a child is around 4 to 5 years of age. However more recent studies (Southgate, Senju, & Csibra, 2007; Surian & Geraci, 2011) claim that younger children are able to mentalise other people's FB. This finding is based on the method of tracking their direction of gaze in such way that their anticipatory-looking indicates an understanding of the protagonist's FB. However, dissociation between the performances in the explicit FB task, where linguistic processing is essential, and the implicit FB task, where only anticipatory-looking was tracked without any linguistic inputs, remains unresolved. The present study examined whether or not the additional narrations used in the FB scenario interfered with the implicit processing of the FB task, which was measured by anticipatory-looking behaviours.

Method

83 Japanese children between 3 and 4 years of age participated in this study. Two conditions were prepared for the FB task based on the work of Southgate et al. (2007). The nonverbal condition included a video clip depicting the protagonist holding a FB as a result of an unexpected transfer of a ball by the puppet (bear). The verbal condition had additional narration depicting the scene. The task had two phases: in the first phase the participants became familiar with the context by being shown the puppet (bear) putting the ball into one of the two boxes. The female protagonist watches the bear's actions, then she retrieves the ball by opening the box in which the bear put the ball. After the familiarization phase, the main test phase began. In the main FB event, the bear puppet put the ball into one of the two boxes while the female protagonist was watching. Then the telephone rang and the female protagonist turned away. While she was looking away, the bear moved the ball. The main FB task included one of the two versions of the FB events, which differed in the timing of the movements of the ball. An eye-tracker (Tobii X-60) tracked the participants' eye-movements to measure fixation durations and identify the location of the initial anticipatory-looking.

Results and Discussion

Analyses were conducted for two dependent variables: 1) initial fixation to either the correct or incorrect location: and 2) fixation duration for each of the correct/incorrect locations. The children's initial fixation was more significantly directed to the correct than incorrect location only in the nonverbal condition: $X2\ (1) = 4.33$, $p = .037$, suggesting that the implicit FB task was successful without language processing (figure 1). Fixation duration did not differ between locations in both conditions. However, there was a difference in anticipatory-looking in the nonverbal condition, which depended on the version of the video. The results suggest that processing linguistic information seems to interfere with anticipatory-looking behaviors. The effect of language processing on mentalising is discussed.

References

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