Journal of Experimental Social Psychology 54 (2014) 102–114

Contents lists available at ScienceDirect

Journal of Experimental Social Psychology

journal homepage: www.elsevier.com/locate/jesp

Individualism-collectivism and interpersonal memory guidance of attention

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HIGHLIGHTS

- Visual attention can be guided by memory contents maintained by a co-actor.
- The contribution of individualism-collectivism to this effect is examined.
- The effect positively correlates with collectivism, but not individualism, scores.
- The effect is enhanced by collectivistic, but not individualistic, priming.
- Competitiveness, a measure of vertical individualism, does not contribute either.

ARTICLE INFO

Article history:
Received 17 April 2013
Revised 18 April 2014
Available online 4 May 2014

Keywords:
Interpersonal processes
Individualism-collectivism
Working memory
Attention
Priming

ABSTRACT

Recently it has been shown that the allocation of attention by a participant in a visual search task can be affected by memory items that have to be maintained by a co-actor, when similar tasks are jointly engaged by dyads (He, Lever, & Humphreys, 2011). In the present study we examined the contribution of individualism-collectivism to this 'interpersonal memory guidance' effect. Actors performed visual search while a preview image was either held by the critical participant, held by a co-actor or was irrelevant to either participant. Attention during search was attracted to stimuli that matched the contents of the co-actor's memory. This interpersonal effect correlated with the collectivism scores, and was enhanced by priming with a collectivistic scenario. The dimensions of individualism, however, did not contribute to performance. These data suggest that collectivism, but not individualism, modulates interpersonal influences on memory and attention in joint action.

Introduction

You are a big fan of whiskies and recently interested in some books about whiskies. You searched online and kept a note of several titles before heading for a bookstore. At the door of the bookstore you met a friend, who talked to you briefly about his recent passion for interior design and showed you some books he just bought. In the bookstore, while you were searching for the food-and-drink section suddenly your attention was captured by some books about interior design, even though you did not care about it at all. In this kind of scenarios information relevant to others is also influencing us even it is not helping us in any way. The question is: why and how does this happen? In the current research, we studied one interpersonal cognitive process, namely the interpersonal memory guidance effect of attention (i.e., the influence on one person's visual attention from the knowledge about another co-acting person's memory representation; He, Lever, & Humphreys, 2011), and investigated the relationship between this effect and the collectivistic and individualistic traits of the co-acting individuals.

Interpersonal cognitive processes

We very often engage with others in actions as human beings are social animals and constantly influenced by social contexts. In the most basic form, the mere presence of others influences individual performance. As a result, simple actions are facilitated whereas complex

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http://dx.doi.org/10.1016/j.jesp.2014.04.010
0022-1031/

actions are impaired (Aiello & Douthitt, 2001; Zajonc, 1965). Apart from the general effect from another individual's presence, aspects of one's performance can also be affected by tasks carried out by others. For instance, when one is observing another person performing a certain action, one has the tendency to perform this action (Prinz, 1997; Rizzolatti & Craighero, 2004). In more complex situations, two or more persons can be involved in the same set of tasks. In these interaction situations, social cognition is fundamentally different from that when only presence or observation is involved (De Jaegher, Di Paolo, & Gallagher, 2010; Schilbach et al., 2013). Possible scenarios include following another person's attention to objects and events (Eilan, Hoerl, McCormack, & Roessler, 2005; Mundy & Newell, 2007), mutually sharing attention to physical objects with a co-actor (Pfeiffer et al., 2012), encoding information to and recalling from memory together (Wegner, 1986), and adjusting actions to co-workers' actions to achieve a common goal (Knoblich & Sebanz, 2006; Richardson, Marsh, & Baron, 2007).

In investigations of the cognitive consequences of tasks being performed by two actors, Sebanz and colleagues (Sebanz, Knoblich, & Prinz, 2003, 2005) demonstrated that action planning is affected by a co-actor's action alternative even when the participants are asked to perform independent tasks. Previously, Simon (1969) found that when participants are making two-choice responses to visual stimuli with two hands, reaction times (RTs) are longer when the stimulus's spatial information is not compatible with the responding hand (e.g., responding to a stimulus on the left with the right hand) than when they are spatially compatible (e.g., responding to a stimulus on the right with the right hand), an effect called spatial compatibility effect. Sebanz et al. extended the finding by showing that this effect is observed when people perform alone a two-choice RT task, where both response alternatives are at their disposal (e.g., responding with right hand to red and with left hand to green), and when they perform a go/nogo task with another person, where only one response alternative is at their disposal (e.g., responding to red while another participant is responding to green). Performing a go/nogo version of the task alone (e.g., responding to red but not to green when there is no co-actor present), however, eliminates this effect. These data suggest that shared aspects of the task context (e.g., the spatial locations of stimuli and responses) are represented when participants engage in joint action.

Several studies suggest that acting together also modulates attention in action. Inhibition of return (IOR) is an effect showing slowed responses for previously attended locations, and represents a bias discouraging attention from going back to previously attended locations (Klein, 2000). Welsh and colleagues (Welsh et al., 2005, 2007) studied this IOR effect between persons by asking two participants (sitting opposite each other) to complete a series of rapid reaching movements to target stimuli. They found that IOR occurs not only within, but also across people: movements to a target that appeared at the same location as a previously presented target were slower than responses to a target that appeared at a new location, when one participant responded to the first and the other to the second stimulus. In this case participants were affected by the context of where stimuli fell on their partner's response trial, when the participants engaged in the same task but across different trials. There can also be negative priming across two people each taking turn to act (Frischen, Loach, & Tipper, 2009). For example, when one of two participants has to ignore a distractor located close to his/her hand, the other participant can show delays in responding to stimuli presented at this location on the subsequent trial. These findings suggest that interacting with a co-actor's action can trigger similar processes of inhibitory attention as performing the action oneself.

Joint performance also relies on shared experiences between the co-acting persons. For example, in Richardson et al.'s study (2012), people showed a gazing preference and memory advantage for negative images in comparison to positive images only when they believed that other people were performing the same task with the same stimulus set. A similar joint action enhancement was found for effects of mood on attitude formation. Participants' attitude towards the stimuli was more influenced by the mood when a co-actor was sharing the same experience compared with the condition when the experience was not shared by a co-actor, and was most affected when the task sharing was among people using similar avatars (Shteynberg, Hirsh, Galinsky, & Knight, 2013). Another study echoed these findings by showing that people are more successful in pursuing a goal if this goal is shared with others, especially when these others are similar to themselves (Shteynberg & Galinsky, 2011). The importance of experience sharing, interestingly, is not restricted to similarity of the tasks, but also extends to the simultaneity of task execution, which also benefits the joint task performance (Shteynberg & Apfelbaum, 2013).

Interpersonal memory guidance

It has been documented that when a participant performs a search task alone, attention is drawn to stimuli that match information held in the participant's working memory (WM; Chelazzi, Miller, Duncan, & Desimone, 1993). For instance, when participants are searching for a target in the search display while holding a picture in the WM, RTs are shorter if the target is by the side of the memorised picture (the picture provides valid information about the target's location) than if the target is far away from that picture (the spatial information is invalid) (Soto, Heinke, Humphreys, & Blanco, 2005). In addition to RTs, this WM guidance process also affects the first eye movements made in search, modulates the perceptual discriminability of the target, and can even operate in an involuntary fashion, when stimuli in WM are irrelevant to the task (Downing, 2000; Soto, Wriglesworth, Bahrami-Balani, & Humphreys, 2010; Soto et al., 2005).

Recently, we studied this coupling between WM and attention in a joint action setup, and showed that shared task representations can affect attention through each actor coding in memory information relevant to only one of the participants (He et al., 2011). Participants were tested in pairs performing a speeded visual search task, in which RTs were recorded, while one participant held an image in WM. The research replicated the standard (intrapersonal) WM-based attentional guidance effect on RTs, showing shorter RTs to targets next to the images the participant had to memorise than to targets falling at locations different from the memorised images. More interestingly, it was found that this effect takes place interpersonally as well — that is, when a participant was aware that the co-actor was memorising a certain image, the participant responded faster to targets flanking this image compared with conditions in which targets were flanking another irrelevant image. This suggests that participants form a co-representation of WM items relevant to their co-actor and use this representation to guide their own attention.

Other evidence indicates that joint action effects are modulated by social factors. For instance, effects of co-representation in joint action tasks are observed when participants are interacting with a person, but not with a non-human agent (Tsai & Brass, 2007). Furthermore, the joint action effect is present for single participants who believe they are interacting with others (Atmaca, Sebanz, & Knoblich, 2011; Tsai, Kuo, Hung, & Tzeng, 2008). Looking into the effect of group membership on social interactions, Shteynberg and colleagues went further to show that social learning, goal pursuit, infusion between mood and attitude, and prominence judgement of stimuli are all enhanced when joint action is performed by similar, compared with dissimilar, actors (Shteynberg, 2010; Shteynberg & Apfelbaum, 2013; Shteynberg & Galinsky, 2011; Shteynberg et al., 2014). Also addressing the group membership issue, our previous studies showed a more complicated pattern. He et al. (2011) tested three groups of participants: Caucasian strangers, Caucasian friends, and Chinese living in Britain. The participants from the latter two groups were considered social ingroup members based on mutual friendship (Caucasian friends) or common cultural and language background (Chinese living in Britain). Neither