Acta Psychologica 182 (2018) 75–81

Contents lists available at ScienceDirect

Acta Psychologica

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

The influence of intention and outcome on evaluations of social interaction

Xiaoying Wu[a], Rui Hua[b], Zhangxiang Yang[b], Jun Yin[b,*]

[a] Department of Psychology and Behavioral Sciences, Zhejiang University, Hangzhou, China
[b] Department of Psychology, Ningbo University, Ningbo, China

ARTICLE INFO

Keywords:
Social interaction
Intent
Outcome
Helpful action
Harmful action

ABSTRACT

Reading and making sense of social interactions between individuals is an important part of our daily social lives. Given that actions tend to be interpreted in terms of intent within the observed outcome, we investigated how intent and outcome interactively influence evaluations of social interactions. Through visual animations, intent was operationalized as an agent's (i.e., actor's) act intentionally or unintentionally having an influence on another agent (i.e., affectee). In Experiment 1, the act was helpful and the consequences brought small or great benefits to the affectee. In Experiment 2, the act was harmful and brought small or great losses to the affectee. We found that for both helpful and harmful contexts, social interaction evaluations were influenced by an interaction between the intent and outcome of the act. Specifically, great help/harm (i.e., the great-benefits or great-losses condition) was rated as a stronger social interaction than small help/harm, and the difference was larger in the intentional condition than in the unintentional condition. Furthermore, regardless of the interaction valence, the effect of the intent was larger than the effect of the outcome when evaluating social interaction. This result suggests that observers consider the intent and outcome jointly when evaluating a given social interaction, and the intent has a privileged role in this process. These findings are consistent with the idea that the intent is often deemed to be the cause driving the effect of outcome, and they help us to understand how social interactions are constructed within the action understanding system.

1. Introduction

Humans implement actions in highly complicated ways. More than behaving solitarily with objects, two or more persons often act on each other (i.e., one person will do X to another, who will then respond with Y; Hinde, 1976; Knoblich & Sebanz, 2008). Reading and making sense of social interactions from a third-person perspective is an essential part of our social lives, and it has a strong role in other types of social-cognitive processing, such as moral judgments and constructing reputations (Hamlin, Wynn, & Bloom, 2007; Ohtsuki, Iwasa, & Nowak, 2015). As observers, we utilize the information about each person's observable actions within a given context as evidence of the invisible link that constitutes their social interaction (Csibra, 2017; Ullman et al., 2009). However, what information is obtained from each individual's actions and how this information precisely influences evaluations of social interactions is still largely unknown.

The ability to recognize social interactions is already evident in the early stages of development (Choi & Luo, 2015; Tatone, Geraci, & Csibra, 2015), and it has consequences for both cognition and behavior, enhancing our fitness (Hamlin et al., 2007; Hamlin, Wynn, Bloom, & Mahajan, 2011). The perceived social interactions, especially coordinated interactions between two individual's actions, have been consistently found to influence the processes of perceiving individuals and understanding their behaviors involved in an interaction (Manera, Del Giudice, Bara, Verfaillie, & Becchio, 2011; Neri, Luu, & Levi, 2006; Yin et al., 2016). For instance, Neri et al. (2006) found that observers' visual discrimination of a human agent was influenced by the actions of a second agent, when those actions (which involved physical contact) could be interpreted as a meaningful social interaction (i.e., fighting or dancing). Manera et al. (2011) confirmed this finding, showing that communicative interaction, even without contact, can increase the likelihood of perceiving a second agent. Furthermore, research has shown that information about an observed socially coordinated interaction influences, and even enhances, the predictive accuracy of expected actions (Yin et al., 2016). Specifically, observers generated much more accurate predictions for temporarily invisible actions that were part of interpersonal social interactions than for those that were not. Concerning these phenomena, it was suggested that information about individuals within an interaction is constructed as a unified representation, which constrains the hypothesis space when making inferences about involved individuals; thus, it leads to the enhanced detection and prediction of various elements of that social interaction (Yin

* Corresponding author at: Department of Psychology, Ningbo University, No. 616 Fenghua Road, Ningbo 315211, China.
E-mail address: yinjun1@nbu.edu.cn (J. Yin).

https://doi.org/10.1016/j.actpsy.2017.11.010
Received 12 July 2017; Received in revised form 27 September 2017; Accepted 6 November 2017

et al., 2016). However, these studies focused on how a social interaction modulates other processes, rather than how social interactions are processed. Therefore, what factors influence the evaluation of a social interaction, in terms of the processing of the social interaction per se, remains unclear.

Within everyday life, actions are typically explained within the framework of the underlying intention of that action as well as its outcome. As such, knowledge of both the intent and outcome is crucial for interpreting the significance of the action (Ames & Fiske, 2013, 2015; Malle, 2004). Because the observable constituents of an individual's actions are what form social interactions, the underlying intent and the outcome of these acts are, of course, important candidates for what factors influence the evaluations of interactions.

Studying how the intent and outcome of an act influence social cognition began long ago, mainly in the context of moral judgment (Baez et al., 2017; Cushman, 2008, 2015; Cushman, Sheketoff, Wharton, & Carey, 2013; Lane & Anderson, 1976; Young, Cushman, Hauser, & Saxe, 2007). In the context of criminal convictions, both the law and our own intuition suggest that the intent and outcome of an act should be relied on when judging an actor's wrongness. Empirically, Young et al. (2007) used functional magnetic resonance imaging to document how information about an agent's beliefs and an action's outcome contributes to, and interactively influences, moral judgment. They displayed scenarios to participants in a 2 × 2 design: protagonists produced either a negative or a neutral outcome for a victim with either a negative or neutral intent driving their actions. For example, in the neutral intent with a negative outcome condition, Grace thought that a white powder was sugar, and so she gave it to a friend to eat; however, it was toxic and it led to that friend's death. When participants in the study were asked to judge the moral permissibility of the action, activation in the right temporoparietal junction (RTPJ)—a brain region associated with belief reasoning in moral judgment—was modulated by the interaction between the intent and outcome. They also found that the intent was more determinative of a moral judgment than the actual outcome, as attempted harm (i.e., negative intent with a neutral outcome) induced higher activation of the RTPJ than accidental harm (i.e., neutral intent with a negative outcome). The privileged role of intent in moral judgments was similarly confirmed in a comparison of typically developing individuals and individuals with high-functioning autism spectrum disorder (ASD), which is characterized by impaired mind reading. In both the ASD and typically developing individuals, attempted harm, which is primarily determined by the intent, was rated as less morally permissible than accidental harm. Furthermore, the difference in the moral permissibility between attempted harm and accidental harm was smaller in individuals with ASD than in typically developing individuals (Moran et al., 2011). The interactive influence of intent and outcome on moral judgment was also observed in judgments of the moral character of an actor who tells lies. Specifically, observers perceived individuals who lie with the intention of benefiting the addressee (i.e., prosocial lies) as more moral than individuals who tell the truth to the detriment of the addressee (Levine & Schweitzer, 2014). Altogether, these studies have consistently indicated that both the intent and outcome interactively contribute to moral judgments, with intent having a privileged effect.

This interactive influence is also implied in the developmental trajectory from outcome-based to intention-based moral judgments (Cushman et al., 2013; Hamlin, 2013; Nobes, Panagiotaki, & Bartholomew, 2016). A series of studies was started by Piaget (1997) who asked children to provide moral judgments about either a good-intentioned action with a bad outcome or a bad-intentioned action with a good outcome. He found that children below about 10 years of age judged the action's wrongness mainly based on the consequences, rather than the intent, whereas adults focused on the intent. Inspired by Piaget's idea, subsequent research has begun challenging the age at which individuals distinguish between intentions and outcomes in morally relevant events. These studies have developed numerous new methodologies for reducing the cognitive demands on participants. They have found that, as with adults, children aged 5–6 years old, and even 8-month-old infants (using a puppet-choice task), rely more on intention than on outcome in moral judgments (Hamlin, 2013; Nobes et al., 2016).

However, moral judgments are distinct from judgments of social interactions. In fact, moral judgments do not necessarily relate to judgments of social interactions; for example, burning a flag. Even in some cases, the detection of a social interaction, especially when someone is harming others, appears to precede for the moral judgment, whereas moral judgments rely more on specific rules and conventions for evaluating wrongness and relate to values (Malle, Guglielmo, & Monroe, 2014; Nichols, 2002). Social interaction evaluations involve determining whether an individual's interaction is prosocial (positive) or antisocial (negative; Jacob & Dupoux, 2008; Ullman et al., 2009) without referring to any conventional and moral norm. Furthermore, moral judgments generally focus on negative interactions (Gray, Schein, & Ward, 2014). Examining the processing of positive interactions is necessary as well, given that they tend to prevail in our daily lives (e.g., helping actions; Zaki & Mitchell, 2013). Therefore, the current study explored whether and how intent and outcome influence evaluations of both positive (Experiment 1) and negative social interactions (Experiment 2) in adults.

To avoid the possible ambiguity caused by verbal descriptions of social events, we adopted visual animations as stimuli in order to manipulate the intention and outcome of an act. However, in visual animations, it is difficult to construct conditions wherein the intent and outcome are directly opposite, as inferences of intent would heavily rely on the outcome of the act (Baker, Saxe, & Tenenbaum, 2009; Gergely & Csibra, 2003). Thus, intent was operationalized as an intentional act or unintentional act of either a helpful action (Experiment 1) or a harmful action (Experiment 2), and we manipulated the impact of the outcome on the affected agent as small or great. In summary, in Experiment 1, an actor's helpful action brought small (maybe none) or great benefits for the affected agent, while in Experiment 2, the actor's harmful action brought small (maybe none) or great losses.

Humans typically explain the action in terms of the underlying intention and the outcome it causes, and the intent is more determinative than the outcome in such explanations, because the intent is often deemed as to be the cause that drives the effect of the outcome (Dennett, 1989; Malle et al., 2014). Therefore, we predicted that observers would incorporate both the intention and outcome when evaluating social interactions. Specifically, compared with an unintentional action, an intentional action would cause observers to evaluate a social interaction as stronger (i.e., a more intensely positive or negative social interaction between two agents) because the intent is determinative for understanding actions. Furthermore, we hypothesized that the enhancing effect of intention would be even greater when the outcome justifies the intention (e.g., the helping/harming intent results in considerable benefits/losses to the others) than when it does not (e.g., the helping/harming intent results in small benefits/losses), as both the intent and outcome provide consistent evidence for inferring the social interaction in the former condition.

2. Experiment 1: helpful actions

In this experiment, we investigated how the intent and outcome influence social interaction evaluations for helping actions. Previous studies have suggested that the intent of an act is usually interpreted based on individuals' options when pursuing a goal (Clarke, 2003; Hernik & Southgate, 2012; Malle, 2004). For example, when an agent has option B but chooses option A to achieve his/her goal, the choice of option A is regarded as more intentional than when the agent does not have option B available. Hence, we changed the intent of the social interaction by manipulating whether it was necessary for the actor to move an obstacle to obtain his own apple, although the agent always