



Kinship effect on subjective temporal distance of autobiographical memory

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ABSTRACT

Autobiographical memory bias in favor of kin was examined through individuals' subjective temporal estimations of past events. In two studies, participants recalled past pleasant and unpleasant experiences (Study 1) and competitive events in which there was a clear winner and loser (Study 2) and rated their temporal judgments of these experiences. Generically unpleasant events and events potentially resulting in interpersonal conflicts were recalled as occurring in the more distant past when involving kin than involving non-kin. This kin-serving episodic temporal judgment bias may be part of the human cognitive architecture partly responsible for altruistic behaviors toward kin.

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1. Introduction

Kin altruism as activated by conscious awareness or lexical identifications of genetic relatedness has been widely observed. Studies based on real-life observations (Betzig & Turke, 1986; Bowles & Posel, 2005; Hames, 1987), experiments involving hypothetical (Burnstein, Crandall, & Kitayama, 1994; O'Gorman, Wilson, & Miller, 2005; Stewart-Williams, 2007) or real situations (Madsen et al., 2007) have all shown that people are more altruistic when consciously dealing with relatives than when their interacting partners are non-relatives. When helping others, people feel more empathetic (O'Gorman et al., 2005) and subjectively closer (Neyer & Lang, 2003) toward kin than non-kin. Empathetic concern predicts helping behavior only toward kin but not non-kin when such egoistic concern as raising one's own affect state was controlled (Maner & Gailliot, 2007). Apart from altruistic behavior and emotion, information processing about kin vs. non-kin also exhibits a kin-serving bias. For example, people attribute success to relatives more than non-relatives when assessing cooperative experiences (Ackerman, Kenrick, & Schaller, 2007).

What drives kin altruism? Recent research based on inclusive fitness theory (Hamilton, 1964) points to a computational mechanism that, as part of our evolved cognitive architecture, regulates altruism and sexual aversion in response to different degrees of genetic relatedness (DeBruine, 2005; Lieberman, Tooby, & Cosmides, 2007; Tooby & Cosmides, 2005). Following this research direction, we propose an autobiographical memory bias that, in response to

kinship awareness, alters subjective feelings of temporal distance about past events to facilitate future altruism.

Memories of positive and negative past events help one to repeat successes and to avoid mistakes when most life events usually repeat themselves. One such recurring life event in the ancestral past is that genetically related individuals almost always co-reside with one another (Hrdy, 1999; Williams & Williams, 1957) so that people have fewer choices to discontinue interactions with kin than with non-kin (Fehr & Fischbacher, 2003). Mechanisms that reduce the chance for negative interpersonal experiences to be carried over into future interactions will be adaptive for maintaining harmonious relationships among close-knit social groups. A kin-serving bias in autobiographical memory (memory about personal experiences) will serve this adaptive function. Consistent with the general principle that memory of past events is reconstructed to achieve congruence with current life goals (Conway & Pleydell-Pearce, 2000; Ross & Wilson, 2003), there may be a specific kin-related memory bias so that negative experiences are felt temporally more distant to the present when they involve kin rather than non-kin. This reasoning is in part supported by recent data showing semantic memory (memory about facts and concept-based knowledge) as a possible target under the selection pressure for survival (Nairne, Pandeirada, & Thompson, 2008; Nairne, Thompson, & Pandeirada, 2007). We speculate that autobiographical memories favorable of kin may be felt temporarily closer to the present and memories disfavoring kin may temporarily be pushed farther back from the present.

A proximal explanation of our hypothesis derives from considering the characteristics of episodic memory (memory about happenings in particular places at particular times) in the context of the wide-ranging observations of kin altruism. One function of

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episodic memory is to guide appraisals of (Klein, Cosmides, Tooby, & Chance, 2002) and behaviors toward others (Pillemer, 2003). Episodes of personal past that enhance self-esteem are felt closer in time, whereas those that are inconsistent with current life goals are felt more remote, independent of the actual timing of the past events (Ross & Wilson, 2002). Autobiographical memory may also be reconstructed in various ways, including alterations of temporal feelings toward past events (Ross & Wilson, 2002, 2003) to achieve congruence with current life goals (Conway & Pleydell-Pearce, 2000). Because individuals are more altruistic toward kin than non-kin, their autobiographical memory may be altered accordingly to be consistent with their kin altruistic goals and behaviors.

In two studies, we asked participants to recall and rate their temporal feelings toward two past events, one involving a cousin and the other involving a friend. In Study 1, half of the participants recalled pleasant experiences and the other half recalled unpleasant experiences. A kin-related autobiographical memory bias should make negative past experiences feel temporally more distant from the present when they involve kin rather than non-kin. In contrast, positive past experiences may be felt temporally closer to the present when they involve kin rather than non-kin.

Hypothesis 1. Memories of generic negative social experience involving kin are recalled as temporally more distant than those involving non-kin, whereas memories of generic positive social experience involving kin are recalled as temporally closer than those involving non-kin.

In Study 2, we examined temporal estimations of past experiences in winning or losing in a competition. Existing research has shown that positive, pleasant and successful experiences are stored temporally closer to the present (Dickson & Bates, 2005; Ross & Wilson, 2002). However, the positive experience of winning over kin is not expected to render the same effect of temporal closeness because competition may distance and alienate the two competing parties and is thus incongruent with kin altruistic behaviors. The same can be said about losing to kin. In both situations, an autobiographical memory bias in the direction of distancing or pushing back the competitive experience would aid continued affiliation with and altruism toward kin. Thus, memories of past events about winning over or losing to kin should be recalled as temporally more distant than those about winning over or losing to non-kin.

Hypothesis 2. Memories of past events about winning over kin are recalled as temporally more distant than those about winning over non-kin, and memories of past events about losing to kin are recalled as temporally more distant than those regarding a loss to non-kin.

2. Study 1

2.1. Participants and procedures

Forty undergraduates (24 females, average age = 21.16, $SD = 2.72$) participated in the study. They were randomly assigned to one of two experimental conditions: recalling pleasant or unpleasant events. For each condition, participants were asked to recall two events that occurred during their high school years, one involving a cousin and the other involving a friend. This temporal boundary was set to reduce variation in event dates, which would make it difficult to compare subjective temporal feelings toward the events. The order of the two events was random. Taking the pleasant condition as an example, participants were asked to think back to their high school days and recall a pleasant event happening between the participant and a cousin (or a friend) at

that time. Participants were asked to write down the event in a few sentences and to rate “how far away does the event feel to you?” (subjective temporal distance, STD) on a 10-point-scale (from 1 = *feels far away* to 10 = *feels like yesterday*). Thus, a higher number represents closer subjective temporal distance. At the end of the experiment, participants were asked to write down, as accurately as possible, the year and month in which the recalled event happened. This variable was estimated temporal distance (ETD) and was later coded into the number of months between the present time and when the event happened. To control for emotional valence of these recalled events, a separate group of 10 undergraduate students served as judges to evaluate the emotional intensity of the recalled events on a 7-point scale ranging from 1 = *not at all intense* to 7 = *extremely intense*. For each event, the mean rating over the 10 judges served as an estimate of the emotional valence of the event and is hitherto referred to as event emotionality.

2.2. Results and discussion

Events recalled by participants were generically pleasant or unpleasant. These reported pleasant events could be grouped into several categories, including playing and entertaining together (45%), sharing good times (17.5%), chatting (12.5%), receiving gifts (10%), and other (15%). Unpleasant events included being hurt or blamed (27.5%), quarreling (20%), scolding (12.5%), tension in the relationship (15%), upsetting situations (12.5%) and others (12.5%).

In a 2 (event: pleasant vs. unpleasant) \times 2 (person: cousin vs. friend) randomized block design, event was a between-subject condition and person was a within-subject condition. The ANOVA results for ETD showed no main effects or interaction effect. For pleasant events, $M = 43.05$ months ($SD = 35.19$) under the cousin condition and $M = 38.50$ months ($SD = 19.83$) under the friend condition. For unpleasant events, $M = 41.45$ months ($SD = 25.71$) under the cousin condition and $M = 41.50$ months ($SD = 19.23$) under the friend condition. The correlation between ETD and STD was not significant under either condition ($r = -0.07$, $p > 0.05$, under cousin condition; $r = -0.15$, $p > 0.05$, under friend condition).

The 2×2 mixed ANOVA on STD showed a significant event \times person interaction ($F(1, 38) = 4.73$, $p < 0.05$, $\eta^2 = 0.11$). The results are reported in Fig. 1. Unpleasant events involving cousins were felt as more distant than those involving friends, whereas there was no difference in STD between pleasant events involving cousins and friends. There were also significant main effects for event ($F(1, 38) = 4.31$, $p < 0.05$, $\eta^2 = 0.10$) and for person ($F(1, 38) = 6.26$, $p < 0.05$, $\eta^2 = 0.14$), showing that participants felt

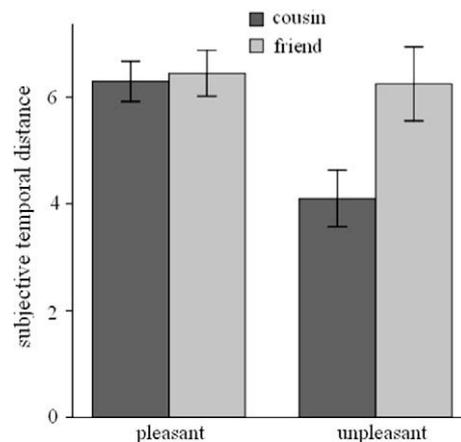


Fig. 1. Means of subjective temporal distance from pleasant vs. unpleasant and cousin vs. friend conditions.

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