



Title	THE RELATION BETWEEN EMOTIONALITY AND EMPATHY-RELATED RESPONSES IN JAPANESE YOUNG CHILDREN
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Citation	乳幼児発達臨床センター年報, 20, 31-42
Issue Date	1998-03
Doc URL	<a href="http://hdl.handle.net/2115/25328">http://hdl.handle.net/2115/25328</a>
Type	bulletin (article)
File Information	20_P31-42.pdf



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## THE RELATION BETWEEN EMOTIONALITY AND EMPATHY-RELATED RESPONSES IN JAPANESE YOUNG CHILDREN

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### Abstract

The relation between emotionality assessed by laboratory observation in infancy and empathy-related responses at 3 years was examined. Each emotionality of Fear, Anger, and Pleasure were assessed at 2 years earlier. Empathy-related responses were assessed with three measures: facial and verbal reactions to distress situation (sympathy and personal distress); prosocial response to doll play; maternal reports of dispositional empathy. The results were as follows: (1) tendency to experience fear predicted later sympathetic behavior; (2) anger emotionality was positively related to personal distress; (3) positive emotionality predicted later sympathetic behavior. These results were discussed in terms of children's regulation of emotion and behavior.

**Key Words:** emotionality, empathy-related response, laboratory observation

### INTRODUCTION

In recent years there has been a renewal of interest in children's characteristics of emotion and its role in social behavior. Many attempts have been made to examine the contribution of emotionality to social behavior (Eisenberg, Fabes, Shepard, Murphy, Guthrie, Jones, Friedman, Poulin, & Maszk, 1997; Eisenberg, Fabes, Murphy, Maszk, Smith, & Karbon, 1995; Rothbart, Ahadi, & Hershey, 1994), behavior problem (Caspi, Henry, McGee, Moffitt, & Silva, 1995; Eisenberg, Fabes, Guthrie, Murphy, Maszk, Holmgren, & Suh, 1996), conscience (Kochanska, 1995; Kochanska, 1997) and social skill (Eisenberg, Fabes, Bernzweig, Karbon, Poulin, & Hanish, 1993).

Empathy is often defined as an emotional response resulting from the recognition of another's emotional state or condition (Eisenberg, Fabes, Murphy, Karbon, Smith, & Maszk, 1996). Eisenberg and Fabes (1990) have differentiated between two vicariously induced emotional reactions, based on Batson's theory (1987). One of the

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The authors wish to thank Professor H. Hill Goldsmith and Ms. Kathy Lemery of the University of Wisconsin, and Professor Grazyna Kochanska of the University of Iowa for help in this research. Correspondence concerning this article should be addressed to Nobuko Hoshi, Faculty of Education, Hokkaido University, Nishi 7, Kita 11, Kita Ku, Sapporo 060 Japan.

reactions is sympathy, defined as an other-oriented emotional reaction (such as concern), and the other is personal distress, defined as a self-oriented emotional reaction (such as discomfort). Those prone to sympathy has a tendency to assist the others who are in distress, whereas children prone to personal distress tend to avoid dealing with the distressing situation (Eisenberg & Fabes, 1990). Despite the conceptual and practical importance of empathy, little is known about the correlates of empathy, particularly of children (Eisenberg & Mussen, 1989). However, in the last decade, with the increasing recognition of the role of emotion in social functioning, it has been argued that individual differences in emotionality affects vicarious emotional responding (Eisenberg, Fabes, Karbon, Murphy, Wosinski, Polazzi, Carlo, & Juhnke, 1996; Eisenberg, Fabes, Murphy, *et. al.*, 1996; Rothbart, *et. al.*, 1994). The purpose of this study is to examine the relationship between emotionality and empathy-related responses.

In considering how emotionality can have influence upon empathy-related responses, the model suggested by Kochanska (1993) is helpful. She proposed that the way in which temperament affected the development of conscience could be divided into two types. We think this model can be applied to the relation of emotionality and other social development including empathy-related behavior. First, emotionality may influence empathy-related responses in a relatively straightforward manner (the main effects). In this respect, Eisenberg and Fabes (1992) advanced a heuristic model in which individual differences in both emotionality and regulatory capacities were associated with the quality of social functioning. In this model, the relative tendency to show either sympathy or personal distress is correlated with individual differences in the tendency to experience either positive or negative emotions. Next, emotionality may moderate the impact of socialization (the interaction effects). The construct of "organismic specificity" (Wachs & Gandour, 1983) is a good example of this type of effects. In this paper, we focus on the main effects of emotionality, and the interaction effects will not be dealt with here.

Eisenberg seems to be one of the first researchers who give much attention to the role of children's own characteristics in their tendency towards empathy. She and her colleagues have explored this problem in a series of studies and have obtained the following results: (1) Adult's reports of children's sympathy, and children's self-reported sympathy were associated with adult's reports of their children's positive emotionality; (2) adult's reports of children's sympathy, and children's self-reported sympathy were associated with adult's reports of children's low negative emotionality; (3) peer nominations for dispositional prosocial behavior were negatively related to adult's reports of their children's negative emotionality; (4) boy's self report of sympathy was related to lower heart rate and lower skin conductance (i.e., more prone to negative emotionality) (Eisenberg, Fabes, Karbon, *et. al.*, 1996; Eisenberg, Fabes, Murphy, *et. al.*, 1996). The association between empathy-related responses and positive emotionality is consistent in adult subjects (Eisenberg, Fabes, Murphy, Karbon, Maszk, Smith, O'Boyle, & Suh, 1994), in children by other researcher (Denham, 1986). Yet, with regard to negative emotionality, it was found to have positive relation to adults' sympathy (Eisenberg, *et. al.*, 1994) but negative relation in children (Eisenberg, Fabes, Karbon, *et. al.*, 1996; Eisenberg, Fabes, Murphy, *et. al.*, 1996). Lack of information

with regard to the contribution of children's emotion to their empathy-related responses calls for further study.

Among the many issues that await investigation, the first point to be discussed in this paper is whether uniformity in emotionality exists across different emotions. Earlier theorists assumed the existence of a uniformity across different emotions (e.g., Thomas & Chess, 1980). However, recent research questioned this uniformity (e.g., Goldsmith & Campos, 1990; Hoshi, Kusanagi, & Chen, 1997). For example, we examined the relations among tendencies in the expressions of fear, anger, and pleasure in fifty infants and the result suggested that different emotions had different expressional tendencies (Hoshi, *et al.*, 1997). Especially, we want to emphasize the differences between the tendencies of anger and fear. These two emotions are typical negative emotions and many researchers have treated them within the same category and so did Eisenberg and her colleagues (e.g., Eisenberg, Fabes, Murphy, *et al.*, 1996). This position was shared by Rothbart, Ahadi, & Hershey (1994) who examined the relation of temperament and social behavior in childhood and concluded that it was necessary to abandon a global temperament model and to analyze the components of negative emotionality (such as anger and fear) and their possible role in social behavior separately. We argue that when we deal with the effects of emotionality, it is necessary to distinguish these two negative emotional tendencies.

A second point to be considered concerns the methods used in measuring emotionality. Three methods are currently been used in the measurement of emotionality: questionnaire, laboratory observation and home observation. In terms of the number of studies the most popular form of emotionality assessment is the parental report questionnaire. In Eisenberg's research, almost all measures of emotionality were from adult reports (either parents or teachers). However, in a series of reviews of studies using questionnaire, this method has been repeatedly criticized for theoretical and psychometric inadequacies (e.g., Rothbart & Mauro, 1990). No investigation using observational-measurement has been carried out concerning the relation between the emotionality and dispositional empathy, with the only exception of Rothbart *et al.* (1994). The present study is a first attempt in using observational assessment for investigating this issue.

Furthermore, the issue of whether later empathy-related reactions can be predicted by emotionality will be dealt with in this paper. Emotionality is considered one of the most important dimensions of temperament (e.g., Goldsmith & Campos, 1982). It has been proposed in many studies that emotionality has a high developmental stability over the first years of life. Nevertheless, little is known about the predictability of later vicarious emotional responding from earlier emotionality. In particular, surprisingly few studies have addressed the issue of the contribution of early emotionality to later social development. This study proposes to do just this.

The last point to be raised concerns the method of empathy assessment. The most commonly used method for assessing empathy in children has been picture/story procedures. Eisenberg and Miller (1987) reexamined the literature and argued that it was not an appropriate method for assessing empathy. In recent years, the following methods have been introduced: measures of facial expressions or verbal reactions to

viewing a person in distress; physiological measures (such as heart rate, skin conductance, and vagal tone); and children's reaction to a set of story stems using doll play. While the methods vary among researchers, the question of how best to assess children's empathy is still an open one.

To sum up, in this paper we examine the relation between each emotionality of fear, anger and pleasure which were assessed by laboratory observations in infancy, and the children's empathy-related responses at 3 years. For empathy-related reactions, we used three measures: (1) facial and verbal reactions to distressed person and films; (2) children's prosocial response to the story stems using dolls (enacted doll procedure); and (3) maternal reports of children's dispositional empathy.

## METHOD

### Overview

The data come from a longitudinal project on emotional development. Children and mothers were assessed on two laboratory sessions, lasting 2 hours each. Children and mothers were observed in the laboratory over several episodes. The entire session was videotaped from behind a one-way mirror. Behavioral data were coded from the videotapes.

### Sample

Time 1. Fifty pairs of mothers and their children (23 boys and 27 girls) visited our laboratory. The children's age ranged from 19 to 20 months and their average age was 19.2 months and their average birth weight was 3129g. All children were free of serious birth complications and congenital anomalies.

Time 2. About two years after the first observation, 30 children (16 boys and 14 girls) attended the second laboratory observation sessions. The children's age ranged from 41 to 45 months and their average age was 42.7 months. Among them, 17 children (10 boys and 7 girls) had participated in the time 1 assessment. About 6 months later, 25 mothers (13 boys and 12 girls) completed a conscience questionnaire and their children's age ranged from 49 to 52 months and their average age was 50.4 months. Among the 25 children, 14 (8 boys and 6 girls) had participated in time 1 assessment.

### Measures of emotionality (Time 1)

#### *Laboratory Temperament Assessment Battery (LAB-TAB)*

For laboratory assessment, we used LAB-TAB. The locomotor version of LAB-TAB was designed by Goldsmith and Rothbart (1992) to make available a standardized instrument for laboratory assessment of temperament for 12- and 18-month-old without unusual or expensive equipment. The temperamental dimensions covered by LAB-TAB include Activity Level, Fearfulness, Anger Proneness, Interest/Persistence, and Joy/Pleasure.

The LAB-TAB is consisted of 20 episodes constructed in 5 dimensions, 4 per dimension. We used a subset of the episodes to measure three emotionalities and Activity Level. We selected the following episodes: Cognitive Assimilation Game

(train), Modified Peek-a-boo Game, and Reaction to Sound and Light Display (Simon) episodes for Joy/Pleasure; Stranger Approach and Remote Controlled Toy episodes for Fear; Gentle Arm Restraint by Parent and Attractive Toy placed behind Barrier episodes for Anger; and Free Play episode for Activity Level. The details of each episode procedure are described in the original LAB-TAB manual and will not be repeated here.

In accordance with the original author's instructions, we employed several practices to minimize carryover effects from one episode to another (Goldsmith & Rothbart, 1991). We began with a nonstressful episode drawn from the Pleasure domains, and we avoided consecutive, potentially stressful episodes in the same room. We interspersed Fear and Anger episodes, and positioned a free play episode midway through the laboratory session. When the child became distressed, the next episode was not resumed until after the child had become sufficiently soothed.

*Coding.* Rating was made from the replay of videotapes by two raters. Five children were excluded from the analysis, as they became too distressed in more than four episodes. Following the guidelines for scoring the LAB-TAB, the longer episodes were typically divided into shorter intervals called epochs. Within each epoch or trial, a number of infant responses, such as smiling, reaching, or crying, were scored. Sometimes the presence or the absence of a response is simply noted; however, more often parameters of the response, such as latency, duration, and intensity, were recorded. The scoring was straightforward and we avoided subjective judgments as much as possible. Analysis for Activity Level of the LAB-TAB has not been performed yet, and will not be reported here. Reaction to Sound and Light Display (Simon) episode was not utilized in the analysis, because about half of the children either did not express pleasure, or displayed ambiguous expression. This episode was judged as inappropriate for eliciting Joy/Pleasure from Japanese children.

In terms of coding fear expression, when crying was observed, it was difficult to assess the expression using only the criteria for coding fear in the Affex (Izard, Dougherty, & Hembree, 1983). If the subject's cry was interpreted as being due to fear, we assessed the expression using both coding system of distress and fear in the Affex, and adopted higher score of the two. As many children expressed intense distress at the epoch of being picked up and held in the Stranger Approach episode, we analyzed epochs before this for the peak of this measure. The parameter in which more than 80% of children had the same score was excluded from final analysis. As a result, the following parameters were excluded: (1) duration and latency of facial expression; (2) duration and latency of bodily expression of fear (Stranger Approach episode); and (3) latency of bodily expression of anger (Attractive Toy placed behind Barrier episode). To calculate interrater reliability, two well-trained raters independently scored 10% of all the episodes, selected randomly. The percentages of agreement between the two raters were higher than 89% for all measures.

*Data aggregation.* All parameters were standardized before statistical analysis. We created a composite score for each episode by averaging standardized scores. Next, we synthesized the higher order composite of each emotion by averaging composite scores of episodes related to each emotion. We used this composite score for each

emotion as the measures of emotionality.

### Measures of empathy-related responses (Time 2)

#### *Laboratory observations*

*Procedure.* The experimenter 'accidentally' caught her finger in a door. She expresses her pain to the subject with exaggeration. After several seconds, She said "I'm all right, now. Don't worry. " And then the subject was shown two film clips with distress content. The first showed a baby crying. The second, being a portion of a popular cartoon for children ("Doraemon"), told the story of Doraemon who was worrying about his sister who was going to have a operation.

*Coding.* Two children were excluded from the analysis, because of the technical failure.

*Facial reactions.* Concerning the episode of the experimenter's pain, each presence of the subject's facial expression of concern (a marker of sympathy) and disgust (a marker of personal distress) was coded from the moment of the experimenter's expression of pain was seen to the time when she conveyed reassurance to the subject. Concerning the film clips, each presence of the subject's facial expression of concern and of disgust for 1 minute during the time when the character (baby or Doraemon) was in distress was coded. The coding of facial expressions was based on Affex (Izard, *et. al.*, 1983). The subject received score 1 when a facial display was observed, otherwise the score was 0.

*Verbal reactions.* The presence of the subject's verbal concern to the experimenter or the character in the films (for example, "Are you all right?", "Is he/she all right?") was coded. The subject received score 1 when one of these utterances were made, otherwise the score was 0.

#### *Enacted doll procedure*

*Procedure.* Using doll play, the experimenter began a story stem. The story was suspended and the subject was encouraged to complete the story. The three story stems for eliciting empathetic or prosocial responses used in this study were as follows. (1) Bicycle (Buchsbaum & Emde, 1990): a peer was in distress after having fallen off a bicycle and got hurt. (2) Crying Baby: a baby was crying in the crib while the mother was absent. (3) Dropping A Candy: a peer was in distress because of having dropped a candy.

*Coding.* Three children were excluded from the analysis, because of the technical failure. The presence of responses such as behaviors or utterances as intended to show helping (applying a Band-Aid), sharing (giving a candy), or soothing (holding a baby) was coded. The subject received score 1 for each story when one of these responses was observed, otherwise the score was 0.

#### *Maternal reports*

Mother was asked to filled out a questionnaire, My Child, a likert-type conscience measure (Kochanska, DeVet, Goldman, Murray, & Putnam, 1994). We calculated the scale score for empathic, prosocial response to distress of the other using 13 items.

## RESULTS

The primary goal of our analyses was to make robust score of empathy-related responses from aggregation across multiple observational contexts, several analogous paradigms. In preliminary analyses, we examined the relations between indices of empathy-related reaction within the episode. Following this we examined the relations of these same indices across episodes. Next we aggregated variables which were related positively to form a composite score. Finally, in the last set of analyses, correlational and regression analyses were conducted in order to assess the degree to which children's empathy-related responses was predicted from their emotionality.

### 1. *Relations among Empathy Measures*

#### a) *Facial expressions and verbal reactions to person in distress*

The subjects were divided into two groups by the presence or the absence of facial expression of concern or disgust or related verbal reaction. Relations between facial expression and verbal reactions in the same episode was examined. Facial expression of concern to the experimenter's pain was associated with verbal reaction in the same episode (Fisher's exact test (2-tail)  $p=0.04$ ). Relations between facial expressions of concern and verbal reactions to the two film clips were not significant. Relations between facial expression of disgust and verbal reaction were not significant in all three episodes.

#### b) *Facial expression or verbal reaction among three episodes and prosocial response among three sessions of doll play*

The subjects were divided into two groups by the presence or the absence of facial expression of concern or disgust or related verbal reaction. Facial expression of concern to experimenter's pain and to the two film clips were highly interrelated with each other (pain \* baby film: Fisher's exact test (2-tail)  $p<0.00$ ; pain \* Doraemon film: Fisher's exact test (2-tail)  $p<0.00$ ; baby film \* Doraemon film: Fisher's exact test (2-tail)  $p<0.00$ ). Facial expression of disgust to the two film clips were associated (Fisher's exact test (2-tail)  $p=0.05$ ). Similarly, verbal reaction to the two film clips were associated, but not significantly (Fisher's exact test (2-tail)  $p=0.10$ ).

In the same way, the subjects were divided into two groups by the presence or the absence of prosocial response in three sessions of doll play. Prosocial response among three stories were not related with each other.

#### c) *Data aggregation.*

Scores for each facial expression in the three episodes were summed up to form two composite scores: concern composite and disgust composite. Likewise, scores of verbal response in the three episodes were summed up to form verbal composite. Doll composite was calculated in the same way. Concern composite, verbal composite, doll composite and scale score of empathy from maternal reports were positively related to each other to some degree (for details, see, Kusanagi, Hoshi, & Takahashi, this volume). These four scores were averaged to form sympathy composite after standardization. Disgust composite was not related to other composite score.



## 2. Correlations between Emotionality and Empathy Measures

Table 1 shows the correlations between the emotionality and the empathy measures. The tendency to experience anger was related to later facial expression of disgust in distress situation. Fear emotionality was negatively associated with children's prosocial reactions to story stems using doll play. Positive emotionality was related to later sympathy composite, and fear emotionality was negatively related to later sympathy. Facial expression of concern, verbal reactions and maternal report appeared to be unrelated to emotionality.

Table 1 Correlation between emotionality and empathy-related responses<sup>a</sup>

empathy-related behavior	emotionality		
	fear	anger	pleasure
concern <sup>b</sup>	-.38	-.00	.09
disgust <sup>b</sup>	-.17	.46 <sup>+</sup>	-.26
verbal response <sup>b</sup>	.17	-.01	.28
doll <sup>b</sup>	-.60*	-.25	.34
maternal report <sup>c</sup>	-.35	.41	.01
sympathy composite <sup>c</sup>	-.63*	.24	.52*

Note: <sup>a</sup> Spearman correlation coefficients <sup>b</sup> n = 17 <sup>c</sup> n = 14 <sup>+</sup> p < .10 \* p < .06

## 3. Prediction of Later Empathy-related responses

In the stepwise regressions (forward selection) with sympathy composite as the dependent variable (Table 2), fear emotionality was entered at step 1; pleasure emotionality was entered at step 2; and anger emotionality was entered at step 3. The effects of fear and pleasure emotionality were significant. Fearless subject were more sympathetic later. Infant who typically experience pleasure more intensely and was prone to experience pleasure tended to show sympathetic behavior more later.

Table 2 Prediction of sympathy composite from emotionality

step	emotionality	R <sup>2</sup> (partial)	R <sup>2</sup> (model)	$\beta$	F
1	fear	.29	.29	-.59	4.98*
2	pleasure	.22	.52	.41	5.10*
3	anger	.02	.54	.13	.53

Note: \* p < .05

## DISCUSSION

Our results can be summarized as follows: (a) the contribution of emotionality to empathy-related responses differ between the two negative emotionality, fear and anger; (b) emotionality which was assessed by observational method was associated with vicarious emotional responding; and (c) later sympathy could be predicted by emotionality of fear and pleasure which assessed in infancy. These results clearly show that children's emotionality affects their empathy-related responses.

The direction of relation between two negative emotionalities and empathy-related responses were the same. Children who were prone to negative emotionality

(fear or anger) behaved less prosocially. Even so, the effects of emotionality on empathy-related responses differ between two negative emotions. Namely, tendency to experience fear was negatively related to sympathy but not to personal distress. On the contrary, tendency to experience anger was related to personal distress, but not to sympathy. Hence it is necessary to distinguish these two negative emotional tendencies when we examine the contribution of emotionality to empathy-related responses.

The pattern of findings in this research generally supports Eisenberg and Fabes's (1992) model. First, tendency to experience fear predicted later sympathetic behavior. Second, anger emotionality was positively related to personal distress. Third, positive emotionality predicted later sympathetic behavior. It is important to take into consideration the children's regulation of their emotion or behavior when we interpret this results. In recent years, there has been considerable interest in children's regulation of emotion (e.g., Dodge, 1989). It has been proposed that the emotion regulation can have influence upon empathy (Eisenberg, Fabes, Karbon, *et. al.*, 1996; Eisenberg, Fabes, Murphy, *et. al.*, 1996; Rothbart, *et. al.*, 1994).

Fearful children are characterized as overcontrol. These children are more likely to inhibit their behavior in response to novel situation. Kagan and his colleagues have refereed to this tendency as behavioral inhibition (Kagan, Reznick, Clarke, Snidman, & Garcia-Coll, 1984). Fearful children are expected to show low level of sympathetic behavior due to their social withdrawal. The results are consistent with Deryberry and Reed's theory (1994). They argued that anxious children develop 'affective maps' of their experience, serving to guide behavior toward potential relief and away from threat. Such representations may affects the overcontrol of fearful children. Arguably, the situation effect must be considered carefully. Stanhope, Bell, and Parker-Cohen (1987) reported that sociability was related to prosocial behavior in the laboratory but not to reported helping at home. On the whole, Japanese children tend to express fear to unfamiliar person or to unfamiliar situation. It is conceivable that the unfamiliarity of the laboratory situation could have affected our subjects.

Children who tend to experience anger are characterized as undercontrol. These children are prone to over arousal in distress situation so that they seem to have a tendency to experience personal distress. This pattern of response is similar to those found by Denham (1986). She found that children who showed predominantly anger revealed deficits in prosocial domains.

As Eisenberg and Fabes (1992) pointed out, positive emotionality was considered as the outcomes of optimal level of emotion regulation. Positive emotionality predicted later sympathetic behavior. The same relation has been shown in most studies on this subject. Eisenberg and her colleagues have reported that adult's report of children's positive emotionality was associated with their sympathy (Eisenberg, Fabes, Murphy, *et. al.*, 1996). This association was reported with adult subjects (Eisenberg, *et. al.*, 1994). Similarly, Denham (1986) showed that children who exhibited relatively more happy emotion in free-play situation were also more likely to behave prosocially. Besides, it was suggested that children's positive affect in a specific situation was associated with their prosocial behavior (e.g., Lennon & Eisenberg, 1987). These results are consistent with the 'tension-release hypothesis' of infant smiling proposed by

Stroufe and Waters (1976) which proposes that smiling occurs as the excitation level rises above, then falls below, some threshold. They emphasized the fact that the same stimulus can lead to either negative or positive affect depending on the infant's evaluating the stimulus situation. In our understanding, smiling occurs when infant can control their arousal at optimal level and infant's failure in regulating their arousal level, the same level of stimulus might lead to negative affect. That is, those who tended to experience pleasure more can regulate their arousal level better. For this reason, children prone to experience positive emotion can be seen to be able to behave more sympathetic in distress situation.

We turn now to an account of the methodology. We used the following three measures for assessing empathy-related responses: Facial expressions or verbal reactions to other person in distress and to person in films; children's prosocial response to story stems of doll play; and maternal reports of children's dispositional empathy. These measures were related to each other but the intercorrelations were not always statistically significant. One of the reasons for this is that the films were not adequate stimulus to arouse young children's empathy, so that only a few subjects expressed verbal reactions to the film situations. Another reason is that the reported dispositional empathy by the mothers was about children's behavior at home (situation effect). Better method of assessment for empathy needs to be developed.

Finally, we must caution that our findings were based on a small sample. However, our findings in this study support the claim that individual differences in emotionality play a significant role in the development of empathy. We would like to go on to an even more detailed examination of the contribution of emotionality to social behavior in our future research.

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