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Culture moderates children's responses to ostracism situations

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Abstract

Across a series of studies, we investigate cultural differences in children's responses to ostracism situations. Working with the children of farmers and herders, we focus on how painful children estimate ostracism to be. Study 1a showed that that 3- to 8-year-old children from a socially interdependent farming community estimated ostracism to be less painful than did children from an independent herding community. Study 1b showed that this cultural difference was specific to social pain and did not apply to physical pain. Study 2 replicated the results of Study 1a and showed that individual differences in parents' level of social interdependence mediated the relationship between cultural group and how painful children estimate ostracism to be. Study 3 replicated this effect again and showed that children's tendency to recommend seeking social support following ostracism mediated the relationship between cultural group and the perceived pain of being excluded. Finally, Study 4 investigated cultural differences in moral responses to ostracism and showed that children from the farming community punished an individual who ostracised someone else less harshly than did children from the independent herding community. Thus different economic cultures are associated with striking differences in social interdependence and responses to ostracism from early in development.

Culture moderates children's responses to ostracism situations

Humans need to belong. The drive to form and maintain social bonds is one of our most fundamental and pervasive motivations (Baumeister & Leary, 1995). As a result, we are extremely sensitive to the threat of exclusion from the group (Over & Carpenter, 2009) and ostracism is very painful (Eisenberger, Liebermann, & Williams, 2003; Williams, Cheung, & Choi, 2000). Even observing others being ostracised can induce feelings of pain and need threat (Wesselmann, Bagg, & Williams, 2009).

Nevertheless ostracism is an essential form of social control: it is used to encourage prosocial behavior among group members and is thus part of our daily lives (Maier-Riguad, Martinsson, & Staffiero, 2010; Williams, 2007). It has been documented across historical time and diverse cultural contexts (Gruter & Masters, 1986; Williams, 2001) and is reported with striking regularity when adults are asked to describe their social relationships (Williams, 2007). The ubiquity of social exclusion means that, not only must humans develop strategies to deal with their own exclusion, they must also develop means by which to interpret and morally evaluate the exclusion decisions of others (Wesselmann, Williams, & Hales, 2013; Will, Crone, Van den Bos, & Güroğlu, 2013).

The Cross-Cultural Perspective

It is often assumed that sensitivity to exclusion runs so deep in our evolutionary history, and forms such a fundamental part of our psychological make-up, that responses to it must be culturally universal (Gonsalkorale & Williams, 2007; Macdonald & Leary, 2005). However, cultural differences in responses to ostracism situations have not yet been extensively investigated. In this paper, we investigate whether differences in social interdependence shape responses to ostracism situations.

In socially interdependent cultures, group members form close social bonds with those around them, encouraging tight-knit social networks and mutual obligations. In less interdependent cultures, individuals form weaker social bonds and thus experience greater autonomy (Markus & Kitayama, 1991).

There are two competing hypotheses regarding how interdependence might be related to responses to ostracism situations. One hypothesis is that individuals from interdependent communities will be more negatively affected by the experience of ostracism because social bonds are so important to them (and thus the risks associated with losing these bonds are great). Another less immediately obvious hypothesis, however, is that individuals within interdependent communities will be less strongly affected by ostracism because their social bonds will serve as a protective buffer against the pain of being excluded by any particular set of individuals.

Support for the latter hypothesis, that high levels of interdependence are in fact protective against the pain of ostracism, has been presented by Pfundmair and colleagues (Pfundmair, Aydin, Du, Yeung, Frey, & Graupman, 2015; Pfundmair, Graupman, Frey, & Aydin, 2015) and by Gardner and colleagues (Gardner, Knowles, & Jefferis, 2016; Gardner, Pickett, & Knowles, 2005). Pfundmair, Aydin et al. (2015) found that participants from independent cultures (e.g., Germany) showed decreased levels of belonging, self-esteem, mood, meaningful existence, and control after experiencing an incident of social exclusion, but participants from interdependent cultures (e.g., China) were affected less or not at all by ostracism. This difference was replicated at the physiological level; participants from an independent culture (Germany) showed increased heart rate following social exclusion, whereas participants from a more interdependent culture (China) demonstrated no change in their heart rate following exclusion. Adding further support to this hypothesis,

Gardner et al. (2016) found that, within Western cultures, adults with strong relational bonds are less negatively affected by ostracism than those with weaker relational bonds, reporting less negative mood and showing less impairment in cognitive performance after an incident of social exclusion. These effects of social interdependence seem to operate through spontaneous activation of social information – chronically interdependent participants activate their interdependent self-construal in the face of rejection. In a similar vein, Ren and colleagues (2014) demonstrated that individuals with interdependent self-construals recover more quickly from the pain of ostracism. Thus, the evidence available to date suggests that social interdependence is likely to act as a protective factor against the pain of social exclusion. These findings are consistent with the pattern of data observed in other literature demonstrating that having strong social connections (e.g., in the form of secure attachment or frequent interaction with supportive individuals) has protective effects in the face of negative experiences (e.g., Eisenberger, Taylor, Gable, Hilmert, & Lieberman, 2007; Karremans, Heslenfeld, van Dillen, & van Lange, 2011).

No cross-cultural work has yet investigated how individuals respond when they witness others being ostracised. This is an important topic of study because it has potential implications for understanding cross-cultural differences in prosocial behavior, bystander intervention, and reputation. Our goal in the current work was thus to investigate whether there are cultural differences in how painful ostracism is perceived to be and whether these are associated with cultural differences in moral evaluations of ostracism events. Based on a growing body of work demonstrating a protective effect of social interdependence in the face of ostracism (e.g., Pfundmair, Aydin et al., 2015; Pfundmaier, Graupmann et al., 2015; Ren et al., 2014, see also Gardner et al., 2016), we predicted that individuals living in communities with high

levels of social interdependence would estimate ostracism to be less painful than individuals living in communities with lower levels of social interdependence. We then went on to test whether this has implications for how individuals react to those involved in the ostracism situation. As ostracism presumably has less negative consequences for those within interdependent communities, we further predicted that these individuals would sympathize less with the victims of ostracism and judge those who ostracise others less harshly than would individuals from a less interdependent community.

In order to investigate just how deep-rooted any cultural differences might be, we tested these hypotheses with young children. There is evidence to suggest that some cultural differences in cognition and behavior are evident early in development (e.g., Cohen & Haun, 2013; Keller, Kärtner, Borke, Yovsi, & Kleis, 2005; Keller, Yovsi, Borke, Kärtner, Jensen, & Papligoura 2004; Imada, Carlson, & Itakura, 2013; Rübeling, Keller, Yovsi, Lenk, Schwarzer, & Kühne, 2011). Rübeling et al. (2011), for example, tested whether differences in interdependence are apparent in preschool children. They found that children from an interdependent culture (Cameroonian Nso farmers) drew themselves smaller relative to others than did children from an independent culture (Germany). The level of interdependence within a culture is also related to social cognitive abilities, for example young children's ability to self-regulate (Keller et al., 2004) and to recognize themselves in a mirror (Keller et al., 2005).

The Developmental Perspective

We know from previous research that young children experience social exclusion. Research on the closely related concept of relational aggression (which involves excluding others from social interactions, but also incorporates other

behaviors such as slandering other children and trying to damage their reputations) has demonstrated that even preschool children sometimes experience relational aggression from their peers (Crick, Casas, & Mosher, 1997). Prolonged experience of relational aggression from peers has been shown to have long-term implications for children's well-being and social adjustment (Crick, 1996; Crick & Bigbee, 1998; Cullerton-Sek & Crick, 2005).

Experimental research has investigated how children respond to being ostracised more specifically. Research in this tradition has shown that children find exclusion from the group distressing. Abrams, Weick, Thomas, Colbe, and Franklin (2011) found that exclusion from an online ball game (Cyberball) was distressing for 8 to 14-year-olds and that it threatened their basic needs of belonging, control, self-esteem and meaningful existence. In related research, Nesdale and Lambert (2007) have shown that when 8 to 10-year-old children are excluded from a group, it produces negative affect.

Other research has shown that, at least from the age of five, children are sensitive to the vicarious experience of ostracism and respond to it with behaviors that serve to reinforce their own position within the group. Children who have been shown brief videos in which one shape appears to be excluded from a group of other shapes subsequently engage in more affiliative imitation than children who have been shown neutral videos or videos that includes information about affiliation (Over & Carpenter, 2009; Watson-Jones, Legare, Whitehouse, & Clegg, 2014). Furthermore, children who have been shown videos depicting ostracism draw more affiliative pictures than do children who have been shown neutral videos. More specifically, they draw themselves standing closer to a friend following this vicarious experience of exclusion (Song, Over, & Carpenter, 2015).

In addition to investigating how children respond to being ostracised, it is also important to address how they respond when they observe third parties being ostracised (Killen, Lee-Kim, McGlothlin, & Stangor, 2002; Killen & Rutland, 2011). Research on third party evaluations of ostracism has tended to focus on how children morally evaluate the exclusion decisions of others, investigating the situations in which they consider it acceptable to prevent someone from joining a group (Killen & Rutland, 2011; Rutland, Killen, & Abrams, 2010). Research in this tradition has shown that children take multiple variables into account when making these decisions including group membership and the maximum number of individuals who can belong to the group (e.g., Rutland et al., 2010).

Another important, and related question is how children evaluate the individuals involved in ostracism situations, and whether they consider them worthy of sympathy or punishment. This question relates closely to the topic of reputation (Aloise-Young, 1993; Banerjee, 2002; Engelman, Over, Herrmann, & Tomasello, 2013) and has implications for our understanding of bystander intervention (Craig & Pepler, 1997; Plötner, Over, Carpenter, & Tomasello, 2015). Recent evidence suggests that the extent to which individuals punish ostracisers and compensate the victims of ostracism increases throughout adolescence and into adulthood (Will et al., 2013). However, no research has yet looked at younger children's sympathy for ostracised individuals and punishment of ostracisers. Thus another goal of the current work was to investigate moral responses to ostracism in young children.

The Current Research

In order to understand how cultural differences in interdependence influence the perceived pain of ostracism and sympathy and punishment for those involved in ostracism situations, we recruited participants from two understudied groups living in

the adjacent districts of the eastern Black Sea Region of Turkey: the children of farmers and the children of herders. Previous research has suggested that the economic basis of a culture exerts a powerful influence over the nature of social relationships within it. Thus, farming communities tend to be highly socially interdependent. They value conformity (Berry, 1967), compliance, conscientiousness, and conservatism in childhood socialization (Barry, Child, & Bacon, 1959). Herding communities are typically less socially interdependent. They value independent decision-making (Berry, 1967, 1979), individualism, assertiveness, and adventurousness in childhood socialization (Barry et al., 1959).

We tested our prediction with children aged between four and eight (with a mean age of six). We chose this age range as previous research has shown that children of this age are likely to have experienced social exclusion, either directly or vicariously, within peer situations (Crick et al., 1997) and that, within the lab, they are able to detect even subtle cues to social exclusion (Over & Carpenter, 2009; Watson-Jones et al., 2014). Given recent research showing the early emergence of moral understanding (e.g., Hamlin, Wynn, & Bloom, 2007; Tomasello & Vaish, 2013) and cultural differences in social cognition (Imada et al., 2013; Keller et al., 2004; 2005), we were expecting even the youngest children in the sample to show the predicted cultural differences. The communities we were working with have small populations and so we were obliged to test a relatively broad age range. This had the advantage that it is allowed us to explore whether there would be age-related changes in the strength of cultural differences in responses to ostracism situations.

The Field Site and Samples

The Black Sea Region of Turkey provides a valuable natural experiment as farmers and herders in this region share the same language, national identity,

ethnicity, and religion but differ in the key theoretical variable of social interdependence. Our samples from the two groups did differ in terms of parental income, and sometimes education level. We controlled for these differences statistically: in all reported studies, the findings remained unchanged when the analyses were repeated with education and income as covariates.

Farmers in this region produce tea in small to medium-sized fields owned by families. They harvest the tea three or four times a year in collaboration with members of immediate and extended families and neighbors. Given their reliance on land cultivation, they are tied to one location and rarely leave their villages for economic purposes. Furthermore, due to the heavy regulation of the tea industry by the state, farmers in this region are primarily producers and hardly ever engage in any business-related competitive or commercial activity (see also Uskul & Over, 2014). High levels of cooperation, lack of mobility, and low levels of commercialism experienced by these tea farmers contribute to high levels of social interdependence in this community (see Greenfield, Maynard, & Childs, 2003; Kağıtçıbaşı & Ataca, 2005; Loucky, 1976; Oishi, 2014; Uskul, Kitayama, & Nisbett, 2008, for supporting arguments).

Herders in this region breed animals to supply meat and dairy products. In some cases, the animals are moved from lowland to highland grazing for several months in the summer, returning to lowlands when temperatures start dropping. Producers sell their products to major factories or commercial enterprises, as well as to local people at weekly markets in neighbouring towns. This requires them to engage in commercial and competitive interactions with others (Uskul & Over, 2014). Different family members tend to be responsible for different types of duties (e.g., taking animals to grazing fields, milking the animals, producing diary products,

processing animal skin and hair). Thus, communities that engage in herding tend to share workload within the family rather than between families/neighbors. Higher levels of mobility and commercialism, and lower levels of cooperation experienced by herders contribute to lower levels of social interdependence in this community (also see Greenfield et al., 2003; Kağıtçıbaşı & Ataca, 2005; Loucky, 1976; Oishi, 2014; Uskul et al., 2008).

Farmers' children were recruited from the villages in Rize where residents are primarily engaged in labor-intensive practices of tea cultivation. Herders' children were recruited from villages in Artvin and Erzurum where individuals earn their living primarily from animal husbandry. The parents of children recruited from the farming communities identified farming as their main economic activity and source of income and parents of children recruited from the herding communities identified herding as their main economic activity and source of income.

To recruit participants, we first approached local villagers in their homes, in the street, in coffee houses, or while working in the tea fields or at grazing areas. We then asked them whether they had any children between the ages of 4 and 8 and, if not, whether they could direct us to anyone they knew who had children in this age range. Once we found parents with children in this age range, we described the study and obtained parents' oral consent before collecting data and asking them to respond to a list of questions about themselves and their child who participated in the study. Testing was mostly conducted in or close to participants' homes and by experimenters who were unaware of the hypotheses of the studies. In all studies, we used a number of experimenters (typically 2 or 3) all of whom collected data in both communities. Participants in all studies were given a small gift to thank for their participation.

Study 1a

Study 1a investigated whether children from the interdependent farming community would respond differently to an ostracism situation than children from the more independent herding community. To test this, we presented children from both cultural groups with a scenario in which an individual was ostracised from a group and asked them to estimate how sad they thought that individual would feel. Based on previous research showing that interdependence provides a protective buffer against the negative effects of social exclusion (Pfundmair, Aydin et al., 2015; Pfundmaier, Graupmann et al., 2015; Ren et al., 2014), we predicted that children from the interdependent farming community would estimate that the ostracised individual felt less sad than would children from the more independent herding community. In order to check that children in the two groups understood the ostracism situation similarly, we also asked them who they thought was responsible for the ostracism situation.

Method

Participants

Participants were the children of farmers and herders ($N = 30$ from each cultural group with equal distribution of boys ($n = 15$) and girls ($n = 15$) in each cultural group, age: $M_{farmers} = 6$ years, 4 months, $M_{herders} = 6$ years, 3 months, range: 3 years, 11 months – 8 years, 9 months) from the eastern Black Sea region of Turkey[1].

Procedure

The experimenter presented children with a pictorial and verbal description of an ostracism situation in which one child was excluded from a group of other children. The picture showed a group of three children talking and a fourth child standing some distance away from the group and looking sad (interested readers can

write to the authors for copies for the drawings used in all reported studies). The experimenter described the scene by saying 'Here is a picture of some children. This child, Meral, is left all by herself. The other children, Nihan, Gül and Aslı don't want to play with her. Nihan, Gül and Aslı all play together but Meral is by herself'. In order to check children understood the situation, the experimenter then asked 'Which child is left all by herself?' 'Which children do not want to play with Meral?' (Note that the names and pictures used matched the sex of the participant in all studies). If children were unable to identify the correct individuals, the experimenter walked them through the situation again.

Following this, the experimenter presented children with a second picture of the ostracised child, this time standing by him or herself and wearing a neutral facial expression. The experimenter said 'This is Meral, the child that Nihan, Gül and Aslı don't want to play with. Meral walks away from the children who do not want to play with her and goes to the park. At the park, there are trees and flowers. How do you think she is feeling?' (Note that the experimenter mentioned the park, trees and flowers in order to ensure that children's responses to the question were not at ceiling). At this point, she placed a likert scale in front of children. This likert scale contained five line drawings of faces ranging from a very sad expression to a very happy expression. The experimenter said 'You can show me using this scale. Does she feel very sad, a little bit sad, OK, happy or very happy?' pointing to each facial expression in turn. A score of 1 indicated a response of 'very sad', a score of 3 indicated a response of 'just OK', and a score of 5 indicated a response of 'very happy'. In order to check whether children in the two groups interpreted the ostracism event in a similar way, the experimenter then removed the picture of Meral standing by herself and replaced it with the drawing depicting the ostracism situation.

Following this, she asked two closely related questions relating to children's understanding of the situation 'Why do you think she was left out?' (pointing to the ostracised child) and then 'Why do you think they don't want to play with her?' (pointing to the ostracising group).

Finally, to alleviate any negative feelings caused by the description of the ostracism situation, the experimenter showed children a 'happy ending' drawing in which the ostracised child was pictured surrounded by other children and told them that the previously ostracised child had met new friends.

Results and Discussion

An independent sample t-test showed that farmers' children ($M = 3.37$, $SD = 1.43$) estimated that the ostracised child felt significantly less sad than did herders' children ($M = 2.33$, $SD = .88$), $t(58) = 3.37$, $p = .001$, $d = .88$ (note that here, and in the other reported studies, higher scores indicate less sadness, see Figure 1). Furthermore, when we examined whether these evaluations were significantly different from the neutral point of the scale (a score of 3), the ratings of farmers' children did not differ significantly from neutral $t(29) = 1.41$, $p = .17$, $d = .37$, but the herders' children judged the ostracised child to be feeling significantly sadder than neutral $t(29) = -4.13$, $p < .001$, $d = 1.08$.

In order to test whether these effects varied as a function of children's age and gender, we conducted a regression analysis with cultural group, children's age, gender and the relevant two-way interactions as predictors of participants' estimation of how sad the ostracised child was feeling. None of the variables emerged as significant predictors ($\beta_{age} = -.17$, $t(54)) = -1.40$, $p = .17$, $\beta_{sex} = -.20$, $t(54) = -1.65$, $p = .10$, $\beta_{cultureXsex} = .001$, $t(54) = .005$, $p = .99$, $\beta_{cultureXage} = .007$, $t(54) = .06$, $p = .95$) except cultural group replicating the above t-test result, $\beta = .41$, $t(54) = 3.44$, $p = .001$, $R^2 =$

.23, $F(5, 54) = 3.24$, $p = .012$.

Children living in the more socially interdependent community thus judged ostracism to be less painful than did children living in the more independent herding community and this pattern did not change as a function of age or gender. Children's interpretation of the event did not differ between the two cultural groups which rules out the possibility that the observed group differences are due to differences in how they interpreted the ostracism situation (see the Supplementary Materials). These results complement previous findings with adults by Pfundmair and colleagues (Pfundmair, Aydin et al., 2015; Pfundmaier, Graupmann et al., 2015) and Gardner et al. (2005, 2016) and extend them by demonstrating that cultural differences in responses to ostracism emerge early in development and occur in situations where individuals witness others' being ostracised.

Study 1b

An outstanding question relates to whether the results of Study 1a can be explained by a more general difference in responding between the two groups. It is possible, for example, that farmers' children may estimate others' mood to be less negative regardless of the cause of that negative mood. In order to investigate whether this was the case, we conducted another study in which participants were presented with a situation where the target individual was sad but for a non-social reason: they had fallen over and hurt their arm (thus experiencing physical rather than social pain). If the effects of interdependence are specific to social pain, then children from the two cultural groups ought not to differ in their estimates of how this individual feels.

Method

Participants

Participants were the children of farmers and herders (N_farmers = 25 (13 girls),

N_herders = 26 (12 girls), age: M_farmers = 5 years, 10 months, M_herders = 5 years, 9 months,

range: 3 years, 7 months – 7 years, 6 months)[2].

Procedure

Participants were presented with a pictorial and verbal description of a child

who, rather than being excluded from a group, fell over and hurt her or his arm. The

experimenter described the picture by saying 'This is Meral. She fell down and hurt

her arm' while pointing to the arm of the child in the picture. Following this, the

experimenter presented children with a second picture depicting the same child

wearing a neutral facial expression (identical to that used in Study 1a) and said 'Meral

walks away from the place where she fell down and hurt her arm and goes to the park.

At the park, there are trees and flowers. How do you think she is feeling?' The

experimenter then presented children with the same 5-point scale as used in Study 1a

and asked them to judge how they thought that child in the picture was feeling.

Results and Discussion

Results showed that that herders' children (M = 2.38, SD = .98) estimated that

the child who hurt her arm felt sad at a similar level as did farmers' children (M =

2.56, SD = 1.83), $t(49)$ = .43, p = .67, d = .12 (Figure 1). Farmers' children do not,

therefore, estimate that individuals will feel less negative regardless of the situation.

A regression analysis conducted with cultural group, child's age and gender and the

relevant interaction terms to predict participants' evaluation of how sad the child felt

did not reveal a significant model, R^2 = .13, $F(5, 45)$ = 1.31, p = .28, indicating that

the observed pattern remained similar for all children in both cultural groups

regardless of their age or gender. These results suggest that the group differences

observed in Study 1a in response to social pain do not extend to physical pain and rule

out the possibility that herders' children have a generalized tendency to estimate the impact of all pain situations to be greater than do farmers' children.

Study 2

Study 2 was designed to address three outstanding issues from Study 1a. First, Study 1a is, to our knowledge, the first demonstration that there are cultural differences in young children's estimates of the pain of ostracism. In consequence, in this study, we sought to replicate the finding that farmers' children estimate ostracism to be less painful than do herders' children. We thus presented a larger sample of children with the same ostracism situation as used in Study 1a, and asked them to estimate how the ostracised individual was feeling.

 Second, Study 1a did not give any indication of how children's social environments might shape their responses to ostracism situations. In this study, we sought to investigate the importance of cultural transmission between parents and children. We reasoned that, if children learn how to relate to others partly from their parents, as previous research has suggested (Keller et al., 2006), then parents' level of social interdependence ought to predict their children's responses to social exclusion situations. We thus investigated the association between parents' self-descriptions (assessed by the Twenty Statements Test; Kuhn & McPartland, 1954) and their children's estimates of how the ostracised individual was feeling. We predicted that the more relationally parents defined themselves, the less painful their children would estimate ostracism to be.

Third, assessing parents' level of interdependence through the Twenty Statements Test also enabled us confirm that the two cultural groups actually differ in their levels of interdependence. In Study 1a, we assumed on the basis of previous

research that farmers and herders differed along this dimension (Uskul et al., 2008,

see also Barry, Child, & Bacon, 1959; Berry, 1967; Edgerton, 1965; Witkin & Berry,

1975) but we did not test it directly. We predicted that, when asked to describe

themselves, parents from the farming communities would produce more

interdependent self-descriptions than would parents from the herding communities.

Method

Participants

In this study, participants were children of farmers ($N = 54$, 26 girls) and

herders ($N = 49$, 26 girls) of comparable ages ($M_{farmers} = 5$ years and 9 months, $M_{herders}$

= 5 years and 8 months, range: 3 years and 8 months to 8 years and 0 months) *and*

their parents (either father or mother depending on availability) (farmers: $N = 54$, 27

mothers, $M_{age} = 35.30$, $SD = 7.33$; herders: $N = 49$, 28 mothers, $M_{age} = 33.53$, $SD =$

6.90)[3].

Procedure

In the first phase, the child's mother or father was invited to complete the

Twenty Statements Task (TST; Kuhn & McPartland, 1954). In the second phase,

using the same materials and procedure as in Study 1a, the experimenter presented

children with an ostracism situation and asked them to indicate how the ostracised

child was feeling following the ostracism event. Once again, the experimenter

finished the study by showing children the happy ending picture to alleviate any

negative feelings.

Coding

We coded participants' self-descriptions in the TST for independence and

interdependence following the guidelines used by other researchers (e.g., Gardner et

al., 2016). Interdependent self-descriptions were further coded as referring to either

relational or collective interdependence. Any self-description that referred to a trait, ability, preference or any other internal characteristic (e.g., I am an impatient person; I like sweet food; I don't enjoy talking) was coded as independent. Any self-description that referred to a role in a relationship (e.g., mother, daughter-in-law; married) or a relational characteristic (e.g., I am a worrier when it comes to my daughter; I am overprotective towards my child) was coded as relational interdependence. Finally, any self-description that referred to a group membership (e.g., Turkish, Muslim, football team fan, farmer) was coded as collective interdependence. A randomly selected 30% of these self-descriptions was coded by a second coder who was unaware of participants' cultural group membership. Coders agreed on 95% of the self-descriptions (kappa = .90). Disagreements were resolved by discussion. Children's responses to the ostracism situation were measured in the same way as in Study 1a.

Results and Discussion

Parents' Responses on the Twenty Statements Test

Overall herders ($M = 9.86$, $SD = 2.49$) generated a slightly higher number of self-descriptions than did farmers ($M = 8.83$, $SD = 2.95$) in the TST, $t(101) = 1.89$, $p = .06$, $d = .38$. An ANOVA with participant gender and cultural group as between subjects variables and the percentage of different types of parental self-descriptions as a within subjects variable demonstrated that participants generated self-descriptions mostly in the independence category ($M = 60.12$, $SD = 16.79$), followed by the relational interdependence category ($M = 33.83$, $SD = 16.32$) and the collective interdependence category ($M = 6.06$, $SD = 10.08$), $F(2,198) = 258.93$, $p < .001$, $\eta_p^2 = .72$ (all post-hoc comparisons were significant at $p < .001$, d's ranged between 1.59 and 3.90). A significant cultural group X type of self-description interaction, $F(2,$

198) = 8.23, p < .001, η_p^2 = .077, showed that farmers (M = 39.02, SD = 15.81)

generated a significantly greater proportion of relational self-descriptions than did

herders (M = 28.11, SD = 15.04), $F(1, 99)$ = 13.71, p < .001, d = .71. In contrast,

herders generated a significantly greater proportion of independent (M = 63.84, SD =

15.90) and collective (M = 8.05, SD = 10.57) self-descriptions than did farmers (M =

56.74, SD = 17.00; M = 4.24, SD = 9.35, respectively), $F_{independent}(1, 99)$ = 4.05, p =

.047, d = 0.43; $F_{collective}(1, 99)$ = 6.33, p = .013, d = .38. This analysis confirms that, as

expected, farmers defined themselves in more relational terms than did herders.

It is interesting to consider why herders defined themselves in more collective

terms than did farmers (however note that the percentage of collective self-

descriptions was low in both groups). This is in line with our previous observations

that herders in this region are commercialists and hence more likely to engage in

interactions with different groups compared to farmers who are mainly producers for

economic reasons (for more details see Uskul & Over, 2014). We reason that these

differences in social interactions, shaped by economic demands that the two groups

face, likely shape their self-descriptions. Moreover, this observation follows the entity

model in independent cultures (herders in this case), namely that in-group

membership is likely to be based on group categories in independent cultural contexts,

and the network model in interdependent cultures (farmers in this case), namely that

in-group membership is likely to be based on personal relationships in interdependent

cultural contexts (Yuki, 2003).

Finally, a significant participant sex X type of self-description X cultural

group interaction, $F(2, 198)$ = 4.39, p = .014, η_p^2 = .042, revealed that both men and

women in the two groups generated the three types of self-descriptions in the general

pattern described above (all ps < .001), except that men in the farming community

generated comparable number of independent and relational self-descriptions, $p = .22$, $d = -.27$.

Children's Responses to the Ostracism Situation

An independent sample t-test replicated the finding observed in Study 1a, with farmers' children estimating that the ostracised child felt significantly less sad ($M = 2.61$, $SD = 1.46$) than did herders' children ($M = 1.67$, $SD = .72$), $t(101) = 4.07$, $p = .001$, $d = .82$ (see Figure 1). Furthermore, when we examined whether these evaluations were significantly different from the neutral point of the scale (again, a score of 3), the ratings of herders' children judged the ostracised child to be feeling significantly sadder than neutral, $t(48) = -12.93$, $p < .001$, $d = 1.23$, whereas farmers' children differed only marginally significantly from neutral, $t(53) = 1.96$, $p = .06$, $d = .38$.

In order to test whether these effects varied as a function of children's age and gender, we conducted a regression analysis with cultural group, and children's age and gender and the relevant two-way interactions as predictors of the children's estimation of how sad the child in the story felt. Once again, none of the variables emerged as a significant predictor ($\beta_{age} = .08$, $t(97) = .87$, $p = .39$, $\beta_{sex} = -.14$, $t(97) = -1.47$, $p = .14$, $\beta_{cultureXsex} = -.06$, $t(97) = -.60$, $p = .55$, $\beta_{cultureXage} = .062$, $t(97) = .66$, $p = .51$) except cultural group replicating the above t-test result, $\beta = .37$, $t(97) = 3.98$, $p < .001$, $R^2 = .18$, $F(5, 97) = 4.21$, $p = .002$.

The Mediating Role of Parents' Self-Descriptions in Cultural Differences in Children's Responses to the Ostracism Situation

Finally, to examine whether parents' level of social interdependence as inferred from their self-descriptions in the TST can account for the observed group differences in children's responses to ostracism situations, we performed a mediation

analysis following the procedure outlined in Hayes (2013, model 4; see Figure 2). Cultural group served as predictor variable (1: farmers, -1: herders) and the estimate of how the ostracized child would feel in the ostracism situation served as outcome variable. As mediator variable, we used the proportion of relational self-descriptions generated by parents only, as the proportion of collective self-descriptions generated by parents, as this did not emerge as a significant predictor of children's estimates of how the ostracized child would feel, $\beta = -.04$, $t(101) = -.37$, $p = .71$. All continuous variables were standardized prior to analysis in order to obtain standardized coefficients (see Friedrich, 1982). We generated 95% bias-corrected bootstrap confidence intervals using 10000 bootstrap samples.

A regression analysis controlling for the percentage of relational self-descriptions generated by parents showed that cultural group has an indirect effect on children's estimate of how sad the ostracized child would feel via parents' level of social interdependence defined by the percentage of relational self-descriptions generated by them, $B = -.15$, $SE = .09$, $CI_{95\%} = -.39$ to $-.008$. This findings indicates that parents' level of relational interdependence was a significant mediator of the association between cultural group and children's estimate of how the target child was feeling following ostracism and helps highlight the importance of cultural transmission between parents and children in shaping children's responses to ostracism situation.

Study 3

In Study 3, we investigate the mechanism by which cultural differences in interdependence lead to differences in children's estimates of the pain of ostracism. If interdependence provides a protective buffer against the negative effects of ostracism,

as has been suggested by previous research (Gardner et al., 2016; Pfundmair, Aydin et al., 2015; Ren et al., 2014), then the relationship between cultural group and the estimated pain of ostracism should be mediated by the tendency to anticipate the ostracized individual seeking social support. Thus, in this study, we presented children with the same ostracism situation that we used in Studies 1a and 2, and asked them what they thought the ostracized child would do to make him/herself feel better. We predicted that children from the interdependent farming community should be significantly more likely to think that the ostracized child would seek social support by playing with their friends, rather than by engaging in a non-social strategy such as playing with a toy. Furthermore, we predicted that the tendency to do so would mediate the relationship between cultural group and the estimated pain of ostracism.

In this study, we also measured children's own conception of their interdependence to further test our assumption that members of the farming communities are more interdependent than are members of the herding communities. In order to do this, we used a task originally developed by Kitayama and colleagues (2009) and adapted by Keller and colleagues (e.g., Rübeling et al., 2011). In this task, we asked children to draw a picture of themselves and their friend. Following the general lead of Song et al. (2015), we predicted that children from the interdependent farming community would draw themselves and their friend standing significantly closer together, reflecting the relational closeness within interdependent communities. Following Kitayama et al. (2009) and Rübeling et al. (2001), we further predicted that children from the interdependent farming community would draw themselves relatively small compared to their friend. We asked children to draw themselves and their friend (and not, for example, their family members) because the ostracism situation depicted in our task showed ostracism between peers. We reasoned that

having interdependent ties with similar others (friends) would be particularly likely to act as a buffer against the pain associated with this situation.

Finally, we wanted to check that any differences in children's responses could not be explained by differences in how frequently ostracism occurred within the two cultural groups. The young age of our participants meant that we could not ask them directly for an estimate of how frequently the type of situation depicted in our stimuli occurred. Instead, we showed the drawing of the ostracism situation to children's parents and asked them how often situations like the one depicted occurred among children of their acquaintance.

Participants

Sixty farmers' children (29 girls) and 60 herders' children (30 girls) with comparable ages ($M_{farmers}$ = 6 years and 6 months, $M_{herders}$ = 6 years and 3 months, range: 4 years 10 months to 8 years 7 months) *and* their parents (either father or mother depending on availability) (farmers: $N = 60$, 50 mothers, $M_{age} = 36.10$, $SD = 12.41$; herders: $N = 60$, 36 mothers, $M_{age} = 36.45$, $SD = 9.47$) participated in this study.[4]

Materials

The materials required for the description of the ostracism situation and the task in which children estimated how sad the ostracised individual was feeling were identical to the ones used in our previous studies. For the drawing task, children were given an A5 piece of paper and a lead pencil.

Procedure

Children. Children were first asked to complete the drawing task. The experimenter presented the child with an A5 piece of paper in landscape orientation and invited the child to draw by saying 'It's time to draw. Draw a picture of you and

your friend'. If the child did not begin to draw or drew something irrelevant, the experimenter repeated their request. Once the child had finished his or her drawing, the experimenter asked the child to confirm which of the individuals depicted was them and marked it with a small cross for coding purposes.

Next, the experimenter placed the depiction of the ostracism situation in front of the child and described it to him or her in the same way as in the previous studies. After checking the child understood the situation, the experimenter removed this picture and placed the picture of the ostracized individual looking sad in front of the child. The experimenter then explained to the child that 'The children who exclude Meral all leave. Meral feels sad because she is left by herself.' In order to capture the richness of children's responses, the experimenter then asked an open-ended question: 'What do you think Meral will do to try and make herself feel better?' allowing children to respond as they wished. If the child did not respond, the experimenter prompted him or her by repeating the question. Regardless of how children responded to this question, the experimenter went on to ask the question in a forced choice manner. This was done in order to maximize the chance that the young participants would give a meaningful response and thus increase the power for our analyses. The experimenter asked 'You know what? Meral has two choices. What do you think Meral will do to try and make herself feel better – will she find some friends to play with or will she play with her favourite toy?' Once again, it the child did not answer, the experimenter repeated the question. Following this, the experimenter removed the picture of Meral looking sad and told children 'So after Meral was left out, she played with her favourite toy/played with her friends' [repeating whichever answer children gave]. The experimenter then asked children as in the previous studies 'How do you think she feels now? You can show me using this scale. Does she feel very sad? A

little bit sad? Ok? Happy? Or very happy? [pointing at each mark on the scale in turn].   As before, if the child did not respond, the experimenter asked him or her again. Finally, the experimenter removed the scale and placed the depiction of the ostracism situation in front of children again and said 'Now look at this picture again. Do you think Meral (pointing at the ostracized child) and the children on the right (pointing to the group of children) know each other or not? If the child did not respond, the experimenter asked a second time. This was done to check that the children from the two cultural groups interpreted the relationship between the individuals involved in ostracism situation in similar ways. As in the previous studies, the procedure always ended with the 'happy ending' scenario.

Parents. In addition to completing a demographic questionnaire, children's parents were asked a question about how frequently ostracism situations, such as those depicted in the picture we had shown their children, occurred for children in their community. The experimenter showed parents the depiction of the ostracism situation (with either boys or girls depending on the gender of their child) and asked them 'Based on your observations how frequently do you think children encounter situations like this one?' Parents were asked to respond on a five-point likert scale (ranging from 1 – not at all common/never happens to 5 extremely common/happens all the time).

Counterbalancing

The order in which the two forced choice options were given was counterbalanced such that half of children in each cultural group were given the option of playing with a favourite toy first and half of children were given the option of playing with friends first. The order in which the two response options were

presented did not interact with any of the findings presented below, hence we do not discuss this variable further.

Coding

Children's responses to the question about how sad the ostracized child was feeling were coded live by the experimenter. Children's responses to the open-ended question about what they thought the ostracized child would do to try to make her/himself feel better were transcribed by the experimenter and later coded into two general categories – social and non-social. The non-social category included responses such as 'she should play with her toys', 'she should watch a movie', 'he should go home and sleep', or 'draw a picture'. The social category includes responses such as 'find different friends to play' and 'play with his other friends'. A minority of participants ($N_{farmers} = 7$, $N_{herders} = 10$) responded in ways that did not fall clearly into either category. Responses of this nature referred to seeking support from their immediate family such as their parents or siblings rather than from peers and examples in which children failed to give a clear answer (e.g., saying s/he should play) or gave no answer at all (e.g., saying they didn't know). A second coder who was unaware of the study hypotheses and children's cultural group membership coded these open-ended responses. There was perfect overlap between the codings of both of the coders (kappa = 1).

Children's responses to the forced choice question were coded live by the experimenter. Part of our motivation for collecting both open-ended and forced choice responses on what participants thought the ostracized child would do was to ensure that we were not missing a large number of possible responses in our forced choice options. As the coding of the open-ended responses show, the majority of responses (86%) were codable into the same categories as our forced choice options.

Children's drawings were coded by two raters who were unaware of the study hypotheses of the study and participants' cultural group membership. Following Song et al. (2015), the distance between children's depiction of themselves and their friend was coded in millimetres along the horizontal axis. If children drew themselves with more than one friend, we coded the mean distance between themselves and the other individuals in millimetres. For the relative size of the self and the friend, the rater drew rectangular boxes around the figures such that the four sides of these boxes touched the furthest extent of the drawings in each direction. The area of these boxes was then calculated and the area of the drawing of the friend (or the average size of the friends if there was more than one) was subtracted from the area of the drawing of the self. The correlations between the two coders' scores ranged between r (67) = .86 and r (90) = .996 for the three measures we analyzed below (self size, relative self-size, and distance between self and friends).

Results and Discussion

Children's Own Conception of Interdependence

We excluded drawings by two children who were mistakenly given a different size of paper (A4) to draw on than were the rest of children (who received A5 size paper). The analyses below do not include drawings by all children because some failed to draw a figure depicting either themselves ($n_{farmers}$ = 5, $n_{farmers}$ = 9) or a friend ($n_{farmers}$ = 18, $n_{farmers}$ = 11) or both themselves and a friend ($n_{farmers}$ = 7, $n_{farmers}$ = 6). The number of farmers' and herders' children whose drawings were excluded due to absence of a self figure or an other figure was comparable (X^2(1, N = 118) = .57, p = .45, φ = -.07; X^2(1, N = 118) = 1.96, p = .16, φ = .13, respectively).

Our analysis of the distance between the children's depiction of themselves

and their friend(s) revealed that, as predicted, farmers' children ($M = 23.87$, $SD =$ 16.99) drew themselves significantly closer to their friends than did herders' children ($M = 40.00$, $SD = 34.09$), $t(53) = -2.34$, $p = .02$, $d = .60$. Farmers' children ($M =$ 1940.80, $SD = 2041.81$) also tended to draw themselves smaller than did herders' children ($M = 2834.21$, $SD = 2930.39$), but this difference was not statistically significant, $t(88) = -1.69$, $p = .09$, $d = -.35$. The size of the self relative to the mean size of friends did not differ between the two groups, $t(66) = .89$, $p = .38$, $d = -.20$. None of the indices of interdependence assessed using this drawing task was associated significantly with children's responses to the ostracism situation or how the ostracized child would do to make her/himself feel better.

Children's Estimates of How the Ostracized Individual Would React

In their open-ended responses, somewhat more farmers' ($N = 24$) than herders' ($N = 13$) children reported that the ostracized child would engage in a social activity (e.g., playing with other children) to make him/herself feel better, and fewer farmers' ($N = 29$) than herders' ($N = 37$) children reported that s/he would engage in a non-social activity (e.g., playing with a toy), $X^2(2, N = 120) = 4.77$, $p = .092$, $\varphi =$ .199. This pattern was repeated in responses to the forced choice question; significantly more farmers ($N = 35$) than herders' ($N = 23$) children reported that the ostracized child would find other friends to play with, and fewer farmers' ($N = 25$) than herders' ($N = 37$) children reported that s/he would play with his/her favorite toy, $X^2(1, N = 120) = 4.81$, $p = .028$, $\varphi = .20$.

Children's Responses to the Ostracism Situation

An independent samples t-test replicated the finding observed in Studies 1a and 2, with farmers' children estimating that the ostracized child felt significantly less sad ($M = 4.40$, $SD = .98$) than did herders' children ($M = 3.50$, $SD = .89$), $t(118) =$

5.27, $p < .001$, $d = .96$.

In order to test whether this effect varied as a function of children's age and gender, we conducted a regression analysis with cultural group, and children's age and gender and the relevant interaction terms as predictors of the children's estimation of how the child in the ostracism situation felt. None of the variables emerged as a significant predictor ($\beta_{age} = .15$, $t(110)) = 1.75$, $p = .082$, $\beta_{sex} = .01$, $t(110) = .085$, $p = .93$, $\beta_{cultureXsex} = .06$, $t(110) = -.06$, $p = .95$, $\beta_{cultureXage} = .11$, $t(110) = 1.35$, $p = .18$, $\beta_{cultureXsexXage} = -.008$, $t(110) = -.10$, $p = .92$) except cultural group replicating the above t-test result, $\beta = .43$, $t(110) = 5.08$, $p < .001$, $R^2 = .23$, $F(7, 110) = 4.68$, $p < .001$.

Finally, when asked whether the ostracized child and the group of ostracizing children depicted in the ostracism situation know each other or not, the majority of children in both groups reported that they knew each other ($n_{farmers} = 53$, $n_{herders} = 51$), $X^2(1, N = 120) = .29$, $p = .59$, $\varphi = .049$, demonstrating that both farmers' and herders' children construed the group membership of the children involved in the ostracism situation in similar ways. This helps us rule out the possibility that the observed group differences may be due to farmers and herders' children's different conceptions of ingroup/outgroup membership of the parties involved in the ostracism situation.

Mediation Analysis

We tested whether farmers' children's greater tendency to report, in response to the forced choice question, that the ostracized child would rely on social support would account for group differences in the estimates of how the ostracized child was feeling (see Figure 3). To that aim, we performed a mediation analysis in MPlus, which allows for categorical variables to be used as mediators unlike in Hayes' models (2013), with cultural group as predictor variable (farmers: 1, herders: -1), the

estimate of how the ostracized child was feeling as outcome variable, and the estimated coping strategy for the ostracized child as a mediator (1: play with others, -1: play with favourite toy). A regression analysis controlling for the estimated coping strategy showed that cultural group has an indirect effect on children's estimate of how the ostracized child was feeling following the ostracism event via the estimated coping strategy, $B = -.11$, $SE = .08$, $CI_{95\%} = .009$ to $.155$.

Parents' Estimate of Frequency of Ostracism

Finally, when asked how frequently they thought children encounter ostracism situations as the one depicted in the study we ran with their children, parents in both farming ($M = 2.57$, $SD = .91$) and herding ($M = 2.48$, $SD = 1.07$) communities responded in comparable ways, $t(118) = .46$, $p = .65$, $d = -.09$, revealing no difference in how common ostracism is perceived to be in these groups. It is thus unlikely that the observed cultural differences can be explained by differences in how familiar children are with ostracism situations.

Study 4

In Study 4, we examined whether the observed differences in the perceived pain of ostracism were reflected in differences in how children morally evaluate ostracism situations. We reasoned that as farmers' and herders' children differ in how painful they perceive ostracism to be, they might also show differences in how they respond to the victims and perpetrators of ostracism.

In order to do investigate this with our young sample, we followed the example of previous developmental research and measured how children distribute resources between the different individuals involved in an ostracism situation (Vaish, Carpenter, & Tomasello, 2009; Will et al., 2013). Previous research suggests that

children distribute relatively more resources to individuals they sympathize with (Vaish et al., 2009) and relatively fewer resources to individuals they seek to punish (Vaish, Carpenter, & Tomasello, 2010).

We reasoned that if ostracism is seen as causing less harm within the farming community, then it should be perceived as a less serious violation, and children within the farming community ought to sympathise less with the victims of ostracism. Similarly, children within the farming community ought to perceive ostracizing others as a less serious violation and so be less inclined to withhold resources from the perpetrators of ostracism.

We thus presented children with the description of the ostracism situation from Study 1a and then gave them two test trials. In one trial, we asked them to distribute 5 stickers between the previously ostracised child and a neutral child. In the other trial, we asked them to distribute 5 stickers between one of the ostracizing group and a second neutral child. We predicted that, if children sympathize with the ostracised child, then they ought to give more resources to them than to the neutral child. If children disapprove of the actions of the ostraciser and seek to punish them, then they ought to give relatively more resources to the neutral child than to the ostraciser. Critically, we also predicted a culture by trial type interaction such that farmers' children would show less sympathy for the ostracised child and weaker punishment of the ostraciser than would herders' children. In order to check that children's distributions were based on the ostracism, rather than another aspect of the situation, we also asked them to justify their distributions and coded whether they made reference to the ostracism situation or not.

In addition to these measures, in order to check that children in the two cultural groups understood the situation in a similar way, we also asked them who

was responsible for the event in the same way as in Study 1a.

Method

Participants

Twenty-eight farmers' children (14 girls) and 30 herders' children (15 girls) participated in this study (age: $M_{farmers}$ = 6 years, 1 month, $M_{herders}$ = 6 years, 2 months, range: 3 years, 8 months – 8 years, 5 months)[5]. Two additional farmers' children were excluded from analyses for failing to distribute any of the stickers.

Procedure

In the initial phase of the study, the experimenter presented children with the pictorial depiction and verbal description of the ostracism situation, just as in Studies 1a and 2, and then checked they understood which character was which. Following this, the experimenter introduced drawings for the first test trial. In these pictures, both individuals wore neutral facial expressions. The experimenter introduced the picture of the neutral child by saying 'This is Selma. She is on her way to the park. She has never met any of the other children'. The experimenter introduced the picture of the ostracised child by saying 'This is Meral. She is the child Nihan, Gül and Aslı didn't want to play with, remember?' The experimenter then placed the pictures of Meral and Selma on the floor or table (as available) approximately 1 foot apart from each other in front of two open boxes. Following this, the experimenter said 'You know what? You can give these children some stickers. Each child has a box'. The experimenter then gave children five stickers and said 'You can give them out however you like'. If children did not distribute any of the stickers, the experimenter prompted him or her to do so by saying 'You can give out the stickers now. You can give them out however you like'. Once children had finished giving out the stickers, the experimenter asked them to justify their choice by saying 'Why have you given

more stickers to this child?' If children gave an ambiguous justifications such as 'because I like her more', the experimenter asked them to explain more thoroughly by saying 'Why do you like her more?'. If children still gave an ambiguous response, the experimenter moved onto the next trial.

Once children had given a justification (or made it clear that they would not do so), the experimenter took the distributed stickers out of the boxes, noted the number of stickers in each box and put them to one side. The experimenter then began the second trial with a new set of five stickers. The experimenter introduced a drawing of the second neutral child by saying 'This is Zeynep. She is on her way to play on the swings. She doesn't know any of the other children'. The experimenter introduced the drawing of ostraciser by saying 'This is Nihan. She is one of the children who didn't want to play with Meral remember? She is friends with Gül and Aslı' (note that both of the individuals depicted in these drawings also wore neutral facial expressions). From this point on, the procedure for the second trial followed that of the first trial exactly. Following the two test trials, children were asked who they thought was responsible for the ostracism situation in the same way as in Study 1a.

Once the study was complete, the experimenter presented the happy ending scenario, thanked children for their participation and gave them a small gift. In addition, children were allowed to keep all 10 stickers from the test trials.

Counterbalancing

The order in which the two test trials were presented was counterbalanced across children: for half of children the ostracised-neutral trial was presented before the ostraciser-neutral trial and, for the other half of children, this order was reversed. In addition to this, for half of children the target individuals (the ostracised and

ostraciser) were introduced before the neutral individuals on the test trials and, for the

other half of children, the neutral individuals were introduced before the target

individuals. Finally, for half of children, the target individual appeared on the left for

both test trials and the neutral trial appeared on the right. For the other half of

children, this order was reversed.

Coding

Children's sticker distributions were coded live by the experimenter.

Differences scores were subsequently created for each trial by subtracting the number

of stickers the participant gave to the neutral child from the number of stickers the

participant gave to the target child (ostracised or ostraciser). These scores were thus

positive when children gave more to the target child and negative when children gave

more to the neutral child.

Children's justifications for their sticker distributions were transcribed by the

experimenter, translated into English, and then coded into three categories. The first

category represented justifications that mentioned ostracism (e.g., 'because she was

ostracised, they did not play with her', 'because she did not play with Meral'). The

second category represented justifications that involved a positive evaluation of one

of the individuals, for example saying 'I like him more'. The final category

incorporated all of the responses that were clearly unrelated to ostracism. This

category included references to the physical appearance of the individuals, for

example 'because her outfit is nice' as well as 'don't know' responses.

Thirty percent of children's justifications were second-coded from the

translated transcriptions by a rater who was unaware of the hypotheses of the study

and children's cultural background. Inter-rater agreement on when participants

mentioned ostracism was 90% for justifications in the ostracised neutral trial (kappa =

.69) and 95% for justifications in the ostraciser neutral trial (kappa = .86).

Disagreements were resolved by discussion.

Results

Sticker Distribution

Preliminary analyses revealed that there was no influence of the various

counterbalancing conditions. As a result, we collapsed across these conditions for the

main analyses. A mixed ANOVA using trial type as a within-subjects factor and

cultural group as a between-subjects factor with difference scores between the number

of stickers distributed to the target child and the neutral child as the dependent

variable revealed no main effect of culture, $F(1, 56) < 1$, but a significant main effect

of trial type. Across both cultural groups, participants gave significantly more stickers

to the target child in the ostracised-neutral trial ($M = 1.29$, $SD = 2.46$) than in the

ostraciser-neutral trial ($M = -1.47$, $SD = 1.97$), $F(1, 56) = 36.79$, $p < .001$, $\eta_p^2 = .40$,

indicating a general tendency to sympathize with the ostracised child and punish the

ostraciser (see Figure 4). Critically, as predicted, there was a significant interaction

between culture and trial type $F(1, 56) = 7.38$, $p < .01$, $\eta_p^2 = .12$. In line with our

predictions, farmers' children punished the ostraciser less harshly ($M = -.68$, $SD =$

2.02), distributing significantly more stickers to them relative to the neutral child than

did herders' children ($M = -2.20$, $SD = 1.63$), $F (1, 56) = 10.04$, $p = .002$, $d = .82$.

Although there was a trend for farmers' children ($M = .82$, $SD = 2.25$) to sympathize

less with the ostracised child than did herders' children ($M = 1.73$, $SD = 2.60$), this

difference did not reach significance, $F (1, 56) = 2.03$, $p = .16$, $d = -.37$.

We also compared the responses within each cultural group to chance. One-

sample t-tests demonstrated that, on one hand, the children of farmers donated only

marginally more to the ostracised individual compared with the neutral individual

than expected by chance ($t(27) = 1.94$, $p = .06$, $d = .52$) and marginally fewer to the ostraciser than expected by chance ($t(27) = -1.78$, $p = .09$, $d = -.48$). The children of herders, on the other hand, donated significantly more stickers to the ostracised individual compared with the neutral individual than expected by chance ($t(29) = 3.65$, $p = .001$, $d = .94$) and significantly fewer resources to the ostraciser than expected by chance ($t(29) = -7.41$, $p < .001$, $d = -1.91$).

As in the previous studies, we tested whether these findings varied as a function of children's age and gender. We conducted a separate regression analysis for each trial with cultural group, children's age and gender and the relevant interaction terms as predictor variables. In none of the analyses did children's age, sex or any of the interaction variables emerge as significant predictors (ostraciser-neutral trial: $R^2 = .17$, $F(5, 52) = 2.08$, $p = .08$, $\beta_{age} = -.03$, $t(52) = .20$, $p = .84$, $\beta_{gender} = .03$, $t(52) = .22$, $p = .83$, $\beta_{culture} = .39$, $t(52) = 3.08$, $p = .003$, $\beta_{ageXculture} = .06$, $t(52) = .47$, $p = .64$, $\beta_{sexXculture} = .10$, $t(52) = .79$, $p = .43$; ostracised-neutral trial: $R^2 = .17$, $F(5,52) = .06$, $p = .66$, $\beta_{age} = .06$, $t(52) = .41$, $p = .69$, $\beta_{gender} = .08$, $t(52) = .55$, $p = .58$, $\beta_{culture} = -.19$, $t(52) = 1.39$, $p = .17$, $\beta_{ageXculture} = .04$, $t(52) = .29$, $p = .77$, $\beta_{sexXculture} = .12$, $t(52) = .88$, $p = .39$), suggesting that the younger and older children and boys and girls performed similarly in the two cultural groups.

Justifications

In the *ostracised-neutral* trial, 19 farmers' children distributed the stickers in the predicted direction. Of these, 84.2% referenced ostracism in their justifications, 5.3% referenced how much they liked the different individuals and 10.5% gave other responses or did not give a justification at all. Twenty-three herders' children distributed their stickers in the predicted direction, all of whom justified their distribution with reference to ostracism. In the *ostraciser-neutral* trial, 21 farmers'

children distributed the stickers in the predicted direction. Of these, 81% referenced ostracism in their justifications and 19% justified their distributions in other ways. Twenty-eight herders' children distributed the stickers in the predicted direction, all of whom justified their distribution with reference to ostracism. It thus appears that children in both cultural groups were, in general, basing their decision on the ostracism situation rather than on some other factor. As in Study 1a, children's interpretation of the event did not differ between the two cultural groups (see the Supplementary Materials).

General Discussion

The current findings demonstrate that culture is associated with profound differences in responses to ostracism situations from early in development. Studies 1a, 2 and 3 demonstrated that children from an interdependent cultural group estimate ostracism to be less painful than do children from an independent cultural group. Study 2 further demonstrated that parental self-concept predicts children's responses to ostracism situations. The more relational parents were in their self-concept, the less painful children estimated ostracism to be. Furthermore, parental self-concept mediated cultural group differences in how painful children estimated ostracism to be. Study 3 demonstrated that the relationship between cultural group and children's estimates of the pain of ostracism was mediated by the extent to which children anticipated engagement in alternative social interactions by the ostracized child following ostracism. Children from the farming community were more likely to anticipate engagement in alternative social interactions following ostracism and their tendency to do so led them to estimate that the ostracized child felt less sad. Study 4 demonstrated that these two cultural groups also differed in their moral responses to

ostracism. Children from the interdependent farming culture judged ostracizing others to be less worthy of punishment than did children from the more independent herding culture. Thus, culture not only shapes how we perceive the pain of ostracism, but how we judge the ostracism decisions of others.

Taken together, the results of these three studies converge with research showing that different ecologies can give rise to different economies, and these different economies shape individuals' responses to social interactions, by, for example, fostering higher levels of social interdependence in farming communities compared to in herding communities (e.g., Edgerton, 1971; Kohn & Schooler, 1973; Konner, 2007; Triandis, 1994; Witkin & Berry, 1975). In doing so, they provide further evidence for higher levels of social interdependence experienced by members of farming communities compared to members of herding communities (e.g., Barry et al., 1959; Berry, 1967). Beyond this, they confirm emerging research demonstrating the important role played by social interdependence in responses to ostracism (Gardner et al., 2016; Pfundmair, Aydin et al., 2015; Pfundmaier, Graupmann et al., 2015; Ren et al., 2014) and extend this work to the perceptions of third party ostracism.

As we conducted this research with children, we are able to conclude that it is not directly engaging in particular economic activities that produces cultural differences. The children who participated in our studies did not themselves earn a living from either farming or herding. Children of this age in both cultural groups are encouraged to go to school, play, and participate in household activities. Rather, it is likely that engaging in different types of economic activity require parents to develop different habits skills, attitudes, and orientations and these different habits skills, attitudes, and orientations shape their children's social judgments.

Beyond contributing to the social and cultural psychological literatures, this work adds to our understanding of development. Previous research has shown that young children are sensitive to the threat of ostracism (Over & Carpenter, 2009; Watson-Jones et al., 2014) and that, as they get older, they are able to make moral decisions about social exclusion (Killen & Rutland, 2011; Wills et al., 2013). We build on this research by showing that, from an early age, children recognize that being ostracised makes other people feel sad. Furthermore, young children also evaluate the individuals involved in ostracism situations, sympathizing with those who are ostracised and punishing those who ostracise others. We provide a valuable paradigm through which future research can continue to investigate the reputational implications of being ostracised and ostracizing others in this younger age group. Finally, this work adds to the developmental literature by providing evidence for a link between parental social interdependence and children's evaluation of ostracism situations, thus highlighting the importance of cultural transmission between parents and their children in shaping responses to ostracism and pointing the way towards important questions for future research.

Interestingly we did not observe age differences in children's responses in any of our studies. This suggests that cultural differences are already apparent even in four-year-old children and highlights the importance of early socialization experiences in fostering these differences (Keller et al., 2005). However, it is entirely possible that other paradigms would find age-related changes in how children respond to ostracism and how culture shapes these responses. Investigating the developmental origin of cross-cultural differences thus remains an important question for future research.

A key strength of a cross-cultural approach is that it allows us to compare how

individuals whose lives are shaped by different socio-ecological environments (see Oishi, 2014, for a review) respond to ostracism experiences. One potential weakness is that, because we compared pre-existing cultural groups, we are not in a position to infer a causal relationship between social interdependence and responses to ostracism. However, the groups we studied in the current research have much more in common than do most cross-cultural comparisons. By working with cultural groups that were matched on important variables such as ethnicity, language and religion, we were able to reduce the number of potentially confounding variables. No natural experiment provides a perfect comparison of course; the cultural groups we worked with differed in terms of parental education and in terms of income. However, when we statistically controlled for these factors, our results remained unchanged.

Another potential limitation is that we focused on only one cultural factor, social interdependence. However, cultures vary along multiple dimensions (e.g., Hofstede, 1980; Gelfand et al., 2011) and responses to ostracism are likely to be influenced by multiple social factors including the nature of peer relations within the group (e.g., Abrams & Killen, 2014; Killen & Stangor, 2001), parenting practices (e.g., Keller et al., 2006) and the amount of interaction with close others and strangers (Uskul & Over, 2014). It will be important for future research to investigate how these other aspects of culture influence children's responses to ostracism and how multiple factors interact within development. One particularly pressing topic for future research is the process by which parental interdependence influences children's responses to ostracism situations. Future research should investigate how these social behaviours and practices are transmitted between individuals.

As we were interested in cultural differences in the estimated pain of ostracism, and in sympathy and punishment in the absence of confounding social

information, the ostracism situation we presented to children in these studies was very simple. Children did not find out any background information about the individuals involved. It would be interesting for future research to investigate the influence of potentially important moderating factors such as the group membership of the individuals involved, and the nature of the relationship between the ostracised individual and the ostracisers (for example, whether they strangers or close friends, see Uskul & Over, 2014). It would also be interesting to investigate whether the responses of farmers' and herders' children would vary depending on whether ostracism came from the entire community or from a subgroup of individuals within that community. It is possible that farmers might actually respond more strongly to ostracism from the entire group than do herders.

Overall, this research highlights the importance of taking a cross-cultural and developmental approach to the study of responses to others' ostracism experiences. Previous research has often assumed that responses to ostracism are innately specified and thus culturally universal. Only by studying responses to ostracism in development, and the nature of variation between cultural groups, can we hope to gain an accurate understanding of the origins of this complex social behavior.

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Footnotes

[1] Participants' parents in both cultural groups were comparable in terms of marital status, $\chi^2(2, N = 60) = 2.07$, $p = .36$, but differed on level of education and income, with farmers having marginally higher level of education, $t(58) = 1.86$, $p = .068$, $d = .48$, and significantly higher income, $t(52) = 3.87$, $p < .001$ $d = 1.00$.

[2] Participants' parents in both cultural groups were comparable in terms of marital status, $\chi^2(1, N = 51) = 2.00$, $p = .16$, and education, $t(49) = 1.68$, $p = .099$, $d = .47$, but differed on income, with farmers having higher income, $t(38) = 3.45$, $p = .001$, $d = 1.22$, than did herders.

[3] Adult participants in both cultural groups were comparable in terms of marital status, with all parents reporting to be married (except one), but differed on level of education and income, with farmers, compared to herders, having significantly higher level of education, $t(101) = 2.57$, $p = .012$, $d = .51$, and significantly higher income, $t(75) = 5.44$, $p < .001$, $d = 1.89$.

[4] Participants' parents in both cultural groups were comparable in terms of marital status, $\chi^2(2, N = 120) = 5.05$, $p = .08$, but differed on level of education and income, with farmers having significantly higher level of education, $t(118) = 3.72$, $p < .001$, $d = .68$, and significantly higher income, $t(115) = 5.26$, $p < .001$, $d = .97$.

[5] Participants' parents in both cultural groups were comparable in terms of marital status, $\chi^2(2, N = 58) = 4.96$, $p = .084$, but differed on level of education and income, with farmers, compared to herders, having higher level of education, $t(56) = 2.14$, $p = .04$, $d = .56$, and higher income, $t(40) = 2.10$, $p = .042$, $d = .65$.
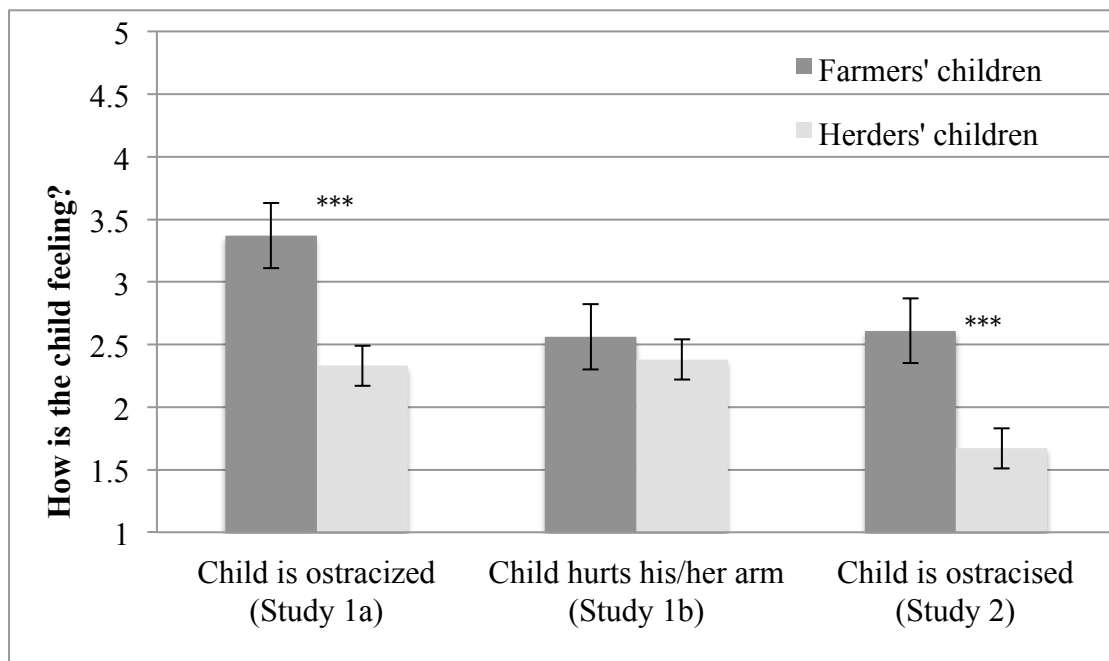
Figure Captions

Figure 1. Children's judgment of how the individual was feeling after being ostracised (Study 1a & Study 2) and after hurting her or his arm (Study 1b).

Figure 2. Study 2: Mediation analysis to examine the mediating role of parental relational interdependence in the relationship between cultural group and children's estimate of how the ostrasized child was feeling.

Figure 3. Study 3: Mediation analysis to examine the mediating role of anticipated coping strategy in the relationship between cultural group and children's estimate of how the ostrasized child was feeling.

Figure 4. The difference in stickers distributed as a function of cultural group and trial in Study 4.
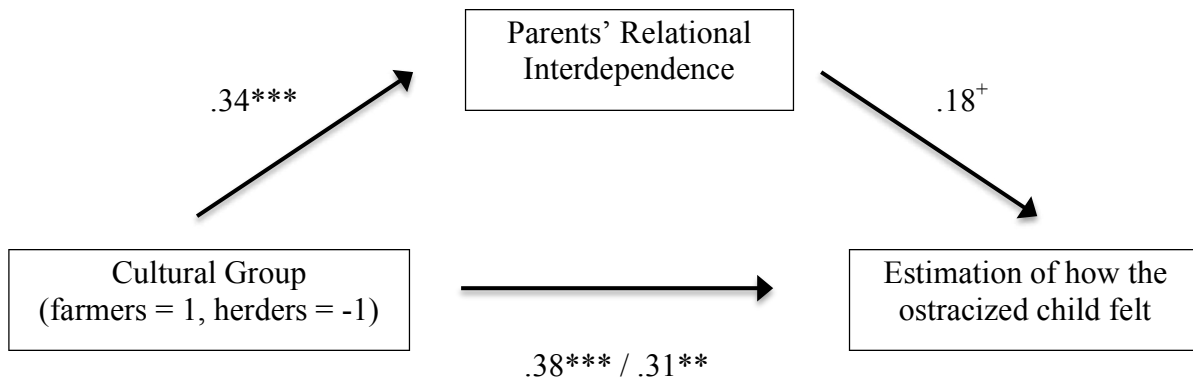
Figure 1.

Note: Error bars represent the standard error. (1 = *very sad* to 5 = *very happy*)
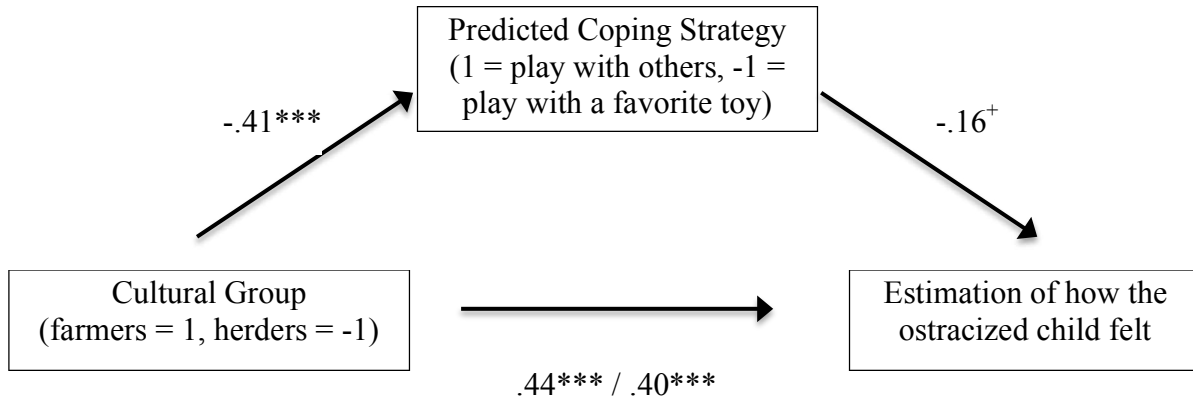
*** *p* < .001

Figure 2.

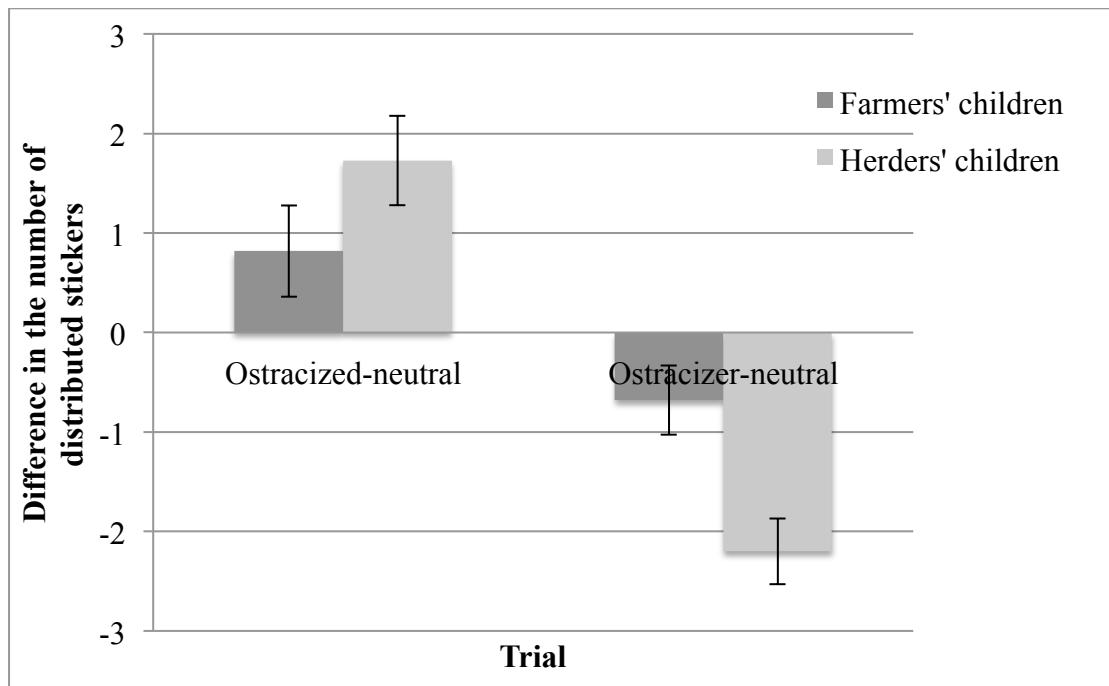Note: Numbers represent standardized regression coefficients. *** $p < $

.001, ** $p < .001.$ $^+p = .06$

Figure 3.

Note: Numbers represent standardized regression coefficients. *** $p <$

.001, $^{+}p = .058$

Figure 4.

Note: Error bars represent the standard error.