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The Association between Unequal Parental Treatment and the Sibling Relationship in Finland: The Difference between Full and Half-Siblings

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Abstract: Studies have shown that unequal parental treatment is associated with relationship quality between siblings. However, it is unclear how it affects the relationship between full and half-siblings. Using data from the Generational Transmissions in Finland project ($n = 1,537$ younger adults), we study whether those who have half-siblings perceive more unequal parental treatment than those who have full siblings only. In addition, we study how unequal parental treatment is associated with sibling relationship between full, maternal, and paternal half-siblings. First, we found that individuals who have maternal and/or paternal half-siblings are more likely to have encountered unequal maternal treatment than individuals who have full siblings only. Second, we found that unequal parental treatment impairs full as well as maternal and paternal half-sibling relations in adulthood. Third, unequal parental treatment mediates the effect of genetic relatedness on sibling relations in the case of maternal half-siblings, but not in the case of paternal half-siblings. After controlling for unequal parental treatment, the quality of maternal half-sibling relationships did not differ from that of full siblings, whereas the quality of paternal half-sibling relationships still did. Fourth, the qualitative comments ($n = 206$) from the same population reveal that unequal parental treatment presents itself several ways, such as differential financial, emotional, or practical support.

Keywords: differential parental treatment, genetic relatedness, siblings, kin detection

Introduction

Individuals tend to be emotionally closer and have more contact with their full siblings than half-siblings, at least in adulthood (e.g., Pollet, 2007; Pollet and Hoben, 2011; Tanskanen and Danielsbacka, 2014). This difference seems to be fairly robust, even when other potentially confounding variables associated with the sibling relationship are

controlled for (e.g., the number of siblings, age difference between siblings, geographical distance to sibling, gender of a respondent and sibling, birth order).

The ultimate explanation for differential full and half-sibling relations can be derived from Hamilton's (1964) inclusive fitness theory. According to the theory, an individual can enhance his or her inclusive fitness by supporting the reproductive success of closely related kin. Thus, the inclusive fitness theory predicts that, all else being equal, individuals should invest more resources (e.g., time, money, emotional support) in more closely related kin. Full siblings have a 50% chance of inheriting the same allele, whereas half-siblings share only a 25% chance. Thus, all else equal, full siblings may benefit more than half-siblings by helping each other, in terms of inclusive fitness.

However, to form differential emotions according to the probability of shared alleles, humans must be able to assess the relatedness of a sibling. All human relatedness is more or less uncertain and must be inferred, except a mother's relatedness to her child. In order to recognize kin members, humans must use cues indicative of relatedness, and these cues can be direct or indirect (e.g., Antfolk, 2014; Bressan and Kramer, 2015). Direct cues can be physical or psychological such as facial or personal resemblance, and they may be other-referent or self-referent (Krupp, DeBruine, and Jones, 2011). The former is based on information from already recognized kin (e.g., mother or father) against which an alleged relative (e.g., sibling) is compared, and the latter is based on information about oneself, against which an alleged relative is compared.

For the most part, humans have to rely on indirect environmental cues. Lieberman, Tooby, and Cosmides (2007) have tracked two such kin detection mechanisms in the case of human siblings: maternal perinatal association (e.g., seeing one's own mother nurse another child), a cue which can be used only by older siblings, and childhood co-residence duration. Naturally, maternal perinatal association requires mother recognition but co-residence duration before adulthood includes all family members who are co-residing, and thus it might be used to also detect other relatives apart from siblings. Co-residence during childhood acts as a proximate kin detection cue and as a precondition for incest aversion (Westermarck, 1891; see also Antfolk, Lieberman, and Santtila, 2012).

As the case of maternal perinatal association indicates, kin recognition of parents is a relevant prerequisite for sibling recognition. However, there is a lack of studies on how children actually detect their parents (but see DeBruine, 2005; Marcinkowska and Rantala, 2012). In particular, father recognition has been understudied, although most probably human children recognize their fathers as the adult male who co-resided and associated with their mother during childhood (Haig, 2011). Antfolk, Lindqvist, Albrecht, and Santtila (2014) found with a sample of Finnish undergraduate and graduate students that three childhood kinship cues associated with kin directed behavior to parents in adulthood: the reported amount of parental support, phenotypic similarity, and behavioral similarity.

Maternal and paternal half-siblings likely differ in terms of their exposure to various kinship cues, which, in turn, could cause differences in the quality of relationships in adulthood. Cues such as childhood co-residence and maternal perinatal association may be available for maternal half-siblings, but neither is usually available for paternal half-siblings. A father's contact with his offspring often attenuates if his sexual relationship with the mother ends, especially if the father has new offspring with a new partner (Haig, 2011; Jankowiak and Diderich, 2000). In addition, maternal and paternal half-siblings differ from each other because of asymmetries of patrilineal and matrilineal relatedness, and this may

affect the perceived difference in attachment among maternal and paternal half-siblings (Haig, 2009; 2011; Schlomer, del Giudice, and Ellis, 2011).

In contemporary Western welfare states (and likely ancestral hunter-gatherer groups), children usually stay with their mothers if parents separate, which means that maternal half-siblings likely co-resided longer than paternal half-siblings (OECD, 2014). Here, we study the sibling relationship in Finland, where approximately 80% of children remain with their mother in the case of parental separation (Statistics Finland, 2012). However, in a previous study that utilized the same data, a difference in contact frequencies between adult full siblings and maternal half-siblings was found to exist even though they most likely lived together in childhood (Tanskanen and Danielsbacka, 2014). This result indicates that there is an additional cue or a factor that differentiates full versus maternal half-sibling relations besides maternal perinatal association and childhood co-residence.

One factor that might deteriorate sibling relationship is parental divorce, which most likely has occurred if a person has younger half-siblings. The rates of divorce and remarriage have increased in contemporary Europe in the last decades (Coleman, 2014) and blended families have become increasingly common (Chapple, 2009). Previous studies show that siblings from divorced families tend to have more conflict with each other in adulthood, which, in turn, is explained by greater parental conflict in divorce families (Poortman and Voorpostel, 2008). Sibling conflict has been found to be highest in single-mother families (Deater-Deckard, Dunn, and Lussier, 2002).

Sibling conflict is often a result of a sibling competition. Siblings have a high tendency to compete with each other over the attention, time, and resources of their parents (Salmon and Hehman, 2014). Trivers' (1974) parent-offspring conflict theory, which is an expansion of Hamilton's (1964) general theory, may explain the reasons for the competition between siblings. From the offspring's perspective it is always beneficial to get as much parental resources as possible, because the offspring is more genetically related to himself or herself than to his or her sibling (with the exception of monozygotic twins; see Segal and Marelich, 2011; Segal, Seghers, Marelich, Mechanic, and Castillo, 2007). From the parental perspective, by contrast, it may sometimes be more evolutionarily beneficial to invest in other offspring. The existence of siblings means the existence of rivalries over access to parental resources (Salmon and Malcolm, 2011; Tanskanen, Danielsbacka, and Rotkirch, in press).

One outcome of sibling competition is that children are fairly good at detecting differential parental treatment in relation to their siblings. Parental treatment can be assumed to reflect parental investments, and thus, unequal parental treatment means unequal parental investment. In our evolutionary past as well as in pre-modern times, resources were probably much scarcer than in modern welfare states, and competition between siblings might have been more intense and had more importance for survival than today.

Nevertheless, contemporary studies show that children begin to be sensitive to differences in parental treatment by the age of 3 (Dunn and Munn, 1985). From that time, they start to actively observe the relationships between their siblings and their parents and to notice whether there are differences in the parental treatment they receive. According to Trivers' (1974) parent-offspring conflict theory, it should be profitable, from the parent's perspective, to invest resources in all biological children, not only one of them. However, if the mother or father has children with multiple partners, she or he may treat the children

differently due to different family structures. For instance, studies have shown that mother-offspring conflict intensifies more if a younger maternal half-sibling arrives than if a younger full sibling arrives (Schlomer, Ellis, and Garber, 2010), which may indicate that mothers allocate their investment differently between half-siblings. Thus, the perceived differential parental treatment, which small children are so keen to observe, may also act as one function that differentiates full, maternal, and paternal half-sibling relations.

Furthermore, differential parental treatment is found to be associated with the quality of the sibling relationship in childhood, adolescence, and adulthood (e.g., Boll, Ferring, and Filipp, 2003; Brody, Stoneman, and McCoy, 1992; Brody, Stoneman, McCoy, and Forehand, 1992; McHale, Crouter, McGuire, and Updegraff, 1995) as well as with children's behavioral problems (e.g., Coldwell, Pike and Dunn, 2008; Reiss et al., 1995). Perceived unfairness in parental treatment of a same-sex sibling observed by the younger party may even be associated with increased delinquency in adolescence (Scholte, Engels, de Kemp, Harakeh, and Overbeek, 2007). In this article, we study whether the unequal parental treatment differs between sibling sets including adult full siblings only and sibling sets including at least one maternal or paternal half-sibling. In addition, we explore the association between perceived unequal parental treatment and the relationship quality between full siblings, maternal half-siblings, and paternal-half siblings. Moreover, we seek to distinguish whether the perceived unequal parental treatment may mediate the effect of genetic sibling relationship.

The present study

The purpose of this study is twofold. First, based on previous results of differential relationships between full and half-siblings, we seek to determine:

Q1) Do sibling sets including maternal and/or paternal half-siblings encounter more unequal treatment from their parents than sibling sets including full siblings only?

Our second aim for this study is based on previous findings on the association between the lineage and the degree of genetic relatedness and the quality of the sibling relationship. We also lean on kin detection theory and derive two questions:

Q2) Is there an association between the category of sibling (full sibling, maternal half-sibling, paternal half-sibling) and the quality of the sibling relationship?

Q3) Does the perceived unequal parental treatment mediate the relationship quality between maternal half-siblings or paternal half-siblings compared to full siblings?

Finally, we explore the following question with qualitative data:

Q4) How does unequal parental treatment manifest itself?

Materials and Methods

In this study, we used data from the Generational Transmissions in Finland (Gentrans) project. The aim of Gentrans is to gather data on kin and other social

relationships within Finnish families. The present study uses the survey of younger adults aged between 19 and 50 years ($M = 36.3$, $SD = 5.6$). The data was collected in 2012 by Statistics Finland via mail (for details, see Tanskanen, Danielsbacka, and Rotkirch, 2014).

In the Gentrans survey, respondents were asked whether they and their sibling have the same mother and father, same mother only, or same father only. If the respondents had the same mother and father as the sibling, the relationship was coded as a full sibling relationship. In the cases where there was only the same mother or only the same father, the relationship was coded as a maternal or paternal half-sibling relationship, respectively. We included only those observations in which the respondent indicated at least one full or half-sibling. To better assess whether the respondents report unequal parental or unequal step-parental treatment, we excluded those respondents ($n = 26$) who indicated either of their parents as a non-biological parent. Thus, data are only analyzed using respondents who responded to the question concerning the equality of treatment from their biological parents. Those respondents who have half-siblings might also have a step-parent, but the majority of these respondents did not report equal or unequal treatment from a step-parent but from a non-custodial biological parent. These selections resulted in a total of 1,537 observations. In the survey, specific information was gathered separately for up to four of the respondent's oldest siblings.

For the first analysis (Q1), an indicator was created that separates those respondents who have full siblings only (1), and those who have at least one half-sibling (2). Our first dependent variable measures parents' unequal treatment. In the Gentrans survey, respondents were asked to report whether their mother, their father, neither of them, or both of them have treated all siblings (including the respondent) equally. To study unequal parental treatment, we used multinomial logistic regression analysis. The group "Both parents treated equally" was used as a base group in the analysis. At the first stage of the analysis, we controlled for several potential confounding variables that were available for the respondent and his or her parents and were predicted to associate with unequal parental treatment based on previous research (e.g., Boll et. al., 2003; Salmon and Hehman, 2014; Schlomer, del Giudice, and Ellis, 2011). These were the respondent's age, birth order, gender, number of siblings, education, health, financial situation, whether the respondent has children, the financial situation of the respondent's parents, the respondent's contact with their parents, and whether the respondent has received practical help from their parents.

However, a full model including all aforementioned variables reduced the number of observations by 12.6% of the sample, and due to that we have omitted from the final model all variables that did not significantly correlate with the dependent variable. This resulted in a final model containing the following variables: the respondent's gender and health, whether the respondent has children, the respondent's contact with their parents, and whether the respondent has received practical help from their parents. The exclusion of variables did not affect the main results concerning the association between the main independent variable (sibling set composition) and perceived unequal parental treatment. With the exception of respondent's health, and respondent's contact with parents, all independent variables were categorical. We have transformed these into dummy variables (see Table 1 for descriptive statistics).

Table 1. Descriptive statistics (*n* and %/mean)

| Survey Item | <i>n</i> | %/mean |
|--|----------|--------|
| Sibling set includes | | |
| Full siblings only | 1,313 | 85.4 |
| At least one half sibling | 224 | 14.6 |
| Sibling relationship | | |
| Full sibling | 2,451 | 86.4 |
| Maternal half sibling | 214 | 7.6 |
| Paternal half sibling | 171 | 6.0 |
| Respondent's gender | | |
| Female | 985 | 64.1 |
| Male | 552 | 35.9 |
| Respondent's health | | |
| Very good | 428 | 27.9 |
| Good | 899 | 58.5 |
| Fair | 192 | 12.5 |
| Poor | 18 | 1.2 |
| Does the respondent have children | | |
| No | 560 | 36.4 |
| Yes | 977 | 63.6 |
| Sibling's age | 2,806 | 35.9 |
| Age difference between respondent and sibling | 2,806 | 6.1 |
| Gender constellation between siblings | | |
| Female and female | 917 | 32.1 |
| Female and male | 1,442 | 50.4 |
| Male and male | 501 | 17.5 |
| Geographical distance between respondent and sibling | 2,800 | 174.8 |
| Conflicts between siblings | | |
| Never | 949 | 33.5 |
| Rarely | 1,402 | 49.4 |
| Now and then | 404 | 14.2 |
| Often | 82 | 2.9 |
| Contacts with parents | 1,537 | 2.9 |
| Received practical help from parents | | |
| No | 388 | 25.2 |
| Yes | 1,149 | 74.8 |
| Perceived unequal parental treatment | | |
| Both treated equally | 1,075 | 73.3 |
| Mother treated equally, father not | 92 | 6.3 |
| Father treated equally, mother not | 114 | 7.8 |
| Both treated unequally | 186 | 12.7 |

Note: Long format data: sibling relationship, sibling's year of birth, gender constellation between siblings, age difference between respondent and sibling, conflicts between siblings.

In the second and third analyses (Q2 and Q3), the dependent variable measures the perceived emotional closeness towards a specific sibling. In the survey, the respondents were asked how close they feel to each of their four oldest siblings. For the analysis, we reversed the variable to ascending order (from 1 = *very distant* to 5 = *very close*). To study emotional closeness between siblings, we used stepwise multilevel linear regression analysis. The main independent variable separates full siblings, maternal half-siblings, and paternal half-siblings into different categories. At the first stage, we included all potential confounding variables that were available in the data and were predicted to be associated with the relationship quality between siblings based on previous research (for a review, see McHale, Updegraff, and Whiteman, 2012; Pollet, 2007). These variables were the age difference between the respondent and the sibling, gender constellation between the respondent and the sibling, sibling's age, geographical distance between the respondent and the sibling, conflicts between siblings, perceived unequal parental treatment, number of siblings, whether the sibling has a child, respondent's birth order, respondent's education, and financial situation of the respondent's parents.

However, the full model including all aforementioned variables reduced the number of observations by 19.3% of the sample (a 20.8% reduction in the number of groups) and due to that we have omitted from the final model all variables that did not significantly correlate with the dependent variable. This resulted in a final model containing the following variables: age difference between siblings, sibling's age, gender constellation between siblings, geographical distance between the respondent and the sibling, conflicts between siblings, and perceived unequal parental treatment. The variables were entered into the stepwise model within three stages to clarify the effect of perceived unequal parental treatment. The first model controlled only for sibling relationship (full, maternal half, paternal half), the second controls for all other control variables except the unequal parental treatment, and the third controls for all control variables including perceived unequal parental treatment. With the exception of the age difference between the respondent and the sibling, sibling's age, the geographical distance between the respondent and the sibling, and conflict between siblings, all independent variables are categorical. We have transformed them into dummy variables (see Table 1 for descriptive statistics). To formally test whether the unequal parental treatment mediates the relationship quality between maternal half siblings compared to full siblings (Q3) a Sobel z-test for mediation was conducted.

To further study unequal parental treatment (Q4), we then analyzed the qualitative text data which is related to the quantitative survey. In the survey, those respondents who answered that they and their siblings have encountered unequal parental treatment were then asked to report in their own words how this unequal parental treatment presented itself. In total 195 (48%) of those respondents who did report that unequal parental treatment existed wrote up their answer to this question. Women ($n = 163$) answered more actively than men ($n = 32$). We coded these texts and analyzed them with qualitative content analysis (Silverman, 2005). First, we systematically read our text data. Second, we identified, counted and categorized themes (i.e., how unequal parental treatment presents itself). Third, we sought typical examples that might help readers to become familiar with the ways that unequal parental treatment appears. The qualitative content analysis does not provide representative information on the subject, but rather provides preliminary results that may show what aspects of unequal parental treatment could be important.

Results

Parents' unequal treatment and siblings' genetic relatedness (Q1)

The results presented in Figure 1 (and in Table 3, the overall model: $-2LL = 2333.1$; Nagelkerke $R^2 = 0.152$, $n = 1,467$) show that the respondents who have only full siblings are less likely to have encountered unequal parental treatment than respondents who have half-siblings. However, the difference is statistically significant only if the mother treated siblings unequally compared to the situation where both parents treated the siblings equally. The predicted probability of reporting unequal maternal treatment among those who have only full siblings is 5.5%, whereas the predicted probability of reporting unequal maternal treatment among those who have at least one half-sibling is 21.5% ($p < .001$), after a wide range of potentially confounding variables have been controlled for. Correlations between independent variables (see Table 2) show no evidence for multicollinearity.

Figure 1. Predicted probability of perceiving unequal treatment from either one or both parents and 95% CI

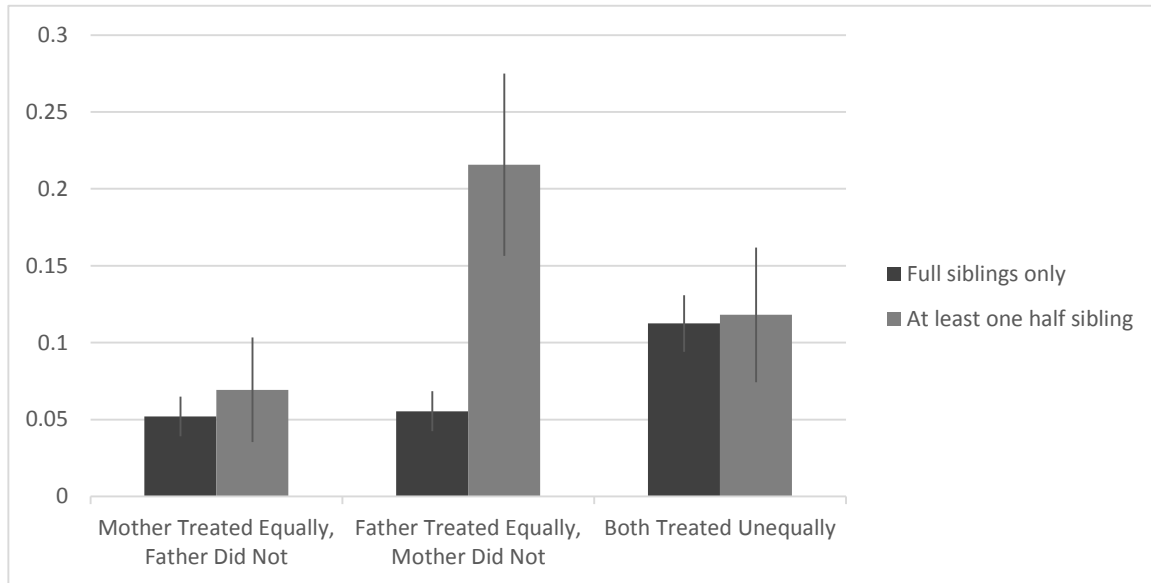


Table 2. Correlations between independent variables in multinomial regression analysis ($n = 1,537$)

| Variable | 1 | 2 | 3 | 4 | 5 |
|---|--------|--------|--------|--------|-------|
| 1. Sibling set constellation | - | | | | |
| 2. Respondent's gender | 0.01 | - | | | |
| 3. Respondent's health | 0.05* | 0.06* | - | | |
| 4. Does the respondent have child(ren) | -0.01 | -0.07* | 0.01 | - | |
| 5. Contacts with parents | -0.15* | -0.09* | 0.02 | 0.05 | - |
| 6. Received practical help from parents | -0.11* | -0.03 | -0.001 | -0.07* | 0.33* |

Note: * $p < .05$

Unequal parenting and sibling relationships

In addition to sibling set constellation, other variables were also associated with the perception of unequal parental treatment (see Table 3). Men were less likely to encounter unequal treatment from mothers, fathers, and both parents than women. Frequent contact with parents and receiving practical help from parents were also associated with a smaller likelihood of reporting unequal parental treatment by either parent or both of them. Receiving practical help from parents was significantly associated with unequal parental treatment only when both parents treated siblings unequally. Respondents' health and whether they had children were associated with reporting unequal parental treatment from mothers, fathers, and both of them, although having children was significantly associated only with the likelihood of reporting unequal paternal treatment.

Table 3. Predicting unequal parental treatment. Multinomial logistic regression analysis (relative risk ratios), base group: equal treatment from both parents

| Survey Item | Mother Treated Equally, Father Did Not | Father Treated Equally, Mother Did Not | Both Treated Unequally |
|---|--|--|------------------------|
| Sibling set includes | | | |
| Full siblings only (ref.) | 1 | 1 | 1 |
| At least one half-sibling | 1.74 | 5.09*** | 1.37 |
| Respondent's gender | | | |
| Female (ref.) | 1 | 1 | 1 |
| Male | 0.57* | 0.56* | 0.35*** |
| Respondent's health | | | |
| | 1.57** | 1.52** | 1.43** |
| Does the respondent have children | | | |
| No (ref.) | 1 | 1 | 1 |
| Yes | 2.31** | 1.11 | 1.27 |
| Contacts with parents | | | |
| | 0.53*** | 0.75* | 0.60*** |
| Received practical help from parents | | | |
| No (ref.) | 1 | 1 | 1 |
| Yes | 0.84 | 0.80 | 0.58** |

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Sibling relationship, genetic relatedness, and parents' unequal treatment (Q2 and Q3)

Next, we turn to the relationship quality between siblings. The random effects from stepwise multilevel linear regression models are presented in Table 5 (see Table 4 for correlations between independent variables). In the first model, only sibling relatedness was included and it correlated strongly with sibling relationship quality measured by emotional closeness. Respondents had more distant relationships with their maternal as well as their paternal half-siblings than with their full siblings (see Table 5, Model 1).

The second model includes (in addition to the relatedness variable) the age difference between the respondent and the sibling, the sibling's age, the gender constellation between the respondent and the sibling, the geographic distance between the respondent and the sibling, and conflicts with sibling. The difference between maternal and paternal half-siblings' versus full siblings' emotional closeness remains significant. The greater the age difference between the respondent and the sibling, the more distant they are

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emotionally, and the older the sibling is the more distant he or she is with the respondent. Also, female-female sibling pairs are emotionally closer than female-male pairs or male-male pairs. As the geographical distance grows, emotional closeness decreases, and the more conflict between siblings, the more distant they are emotionally.

Table 4. Correlations between independent variables in multilevel linear regression analysis ($n = 2,616$)

| Variable | 1 | 2 | 3 | 4 | 5 | 6 |
|---|--------|--------|--------|-------|--------|-------|
| 1. Sibling relationship | - | | | | | |
| 2. Age difference between respondent and sibling | 0.39* | - | | | | |
| 3. Gender constellation between siblings | -0.01 | 0.01 | - | | | |
| 4. Sibling's age | -0.06* | -0.21* | 0.0004 | - | | |
| 5. Geographical distance between respondent and the sibling | 0.03 | -0.01 | -0.04* | -0.01 | - | |
| 6. Conflicts between siblings | -0.16* | -0.17* | -0.11* | 0.04* | -0.03 | - |
| 7. Perceived unequal parental treatment | 0.16* | 0.05* | -0.10* | 0.02 | -0.05* | 0.13* |

Note: * $p < .05$

Table 5. Factors associated with emotional closeness between full, maternal, and paternal half siblings. Stepwise multilevel linear regression model (β coefficients)

| Survey Item | Model 1 | Model 2 | Model 3 |
|--|----------|----------|-----------|
| Sibling relationship | | | |
| Full sibling (ref.) | | | |
| Maternal half-sibling | -0.27*** | -0.17* | -0.13 |
| Paternal half-sibling | -1.14*** | -1.15*** | -1.10*** |
| Age difference between respondent and sibling | | -0.02*** | -0.02*** |
| Sibling's age | | -0.02*** | -0.02*** |
| Gender constellation between siblings | | | |
| Female and female (ref.) | | | |
| Female and male | | -0.49*** | -0.50*** |
| Male and male | | -0.40*** | -0.43*** |
| Geographical distance between respondent and sibling | | -0.0002* | -0.0002** |
| Conflicts between siblings | | -0.28*** | -0.25*** |
| Perceived unequal parental treatment | | | |
| No (ref.) | | | |
| Yes | | | -0.32*** |
| Goodness of fit | | | |
| -2 Log Likelihood | 7427.14 | 6854.95 | 6575.64 |
| AIC | 7437.14 | 6876.95 | 6599.64 |
| Adjusted R^2 | 0.0657 | 0.1437 | 0.1704 |
| n (obs.) | 2,799 | 2,710 | 2,623 |
| n (groups) | 1,556 | 1,524 | 1,456 |

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

In Model 3, we bring in the perceived unequal parental treatment variable. Those who have encountered unequal parental treatment feel that their siblings are more distant. However, in Model 3 the difference between maternal half-siblings and full siblings is insignificant ($p = .077$). This indicates that the perceived unequal parental treatment mediates the effect of genetic relationship in the case of maternal half-siblings. To test whether the mediation effect is significant, a Sobel z -test was conducted. According to the Sobel z -test the perceived unequal parental treatment was a mediator ($p < .001$).

The manifestations of unequal parental treatment (Q4)

Table 6 shows that unequal parental treatment may manifest itself in several ways. Analyzing the qualitative text data, we found five categories of unequal treatment: 1) material, 2) emotional, and 3) practical support, 4) distribution of tasks and restrictions, and 5) distribution of emotional and physical violence. It is worth mentioning that these categories are not always clearly defined, since some answers could be classified in more than one category. In such cases, we have classified them into the category that is most relevant. Thus, all themes are classified into one specific category and these categories are mutually exclusive. However, some respondents have mentioned more than one type of unequal parental treatment; in these cases, we have placed the respondent in more than one category. As Table 6 shows, the total number of instances of unequal parental treatment ($n = 206$) exceeds the number of respondents ($n = 195$). Many respondents described how unequal parental treatment presented itself in childhood and adolescence. Because all our respondents are adults, unequal parental treatment seems to remain in one's mind for a long time. Of course, there are also descriptions of how parents tend to treat siblings differently in adulthood. In addition, there are some cases where the respondents have not specified the forms of unequal parental treatment. These include instances such as, "my brother was favored in every possible way," and "since early childhood our parents have treated us siblings unequally." These are not classified into any category. Next we consider the five themes presented in Table 6 more precisely.

Table 6. List of unequal parental treatment reported ($n = 206$)

| Unequal Treatment Category | <i>n</i> |
|---------------------------------|----------|
| Material support | 75 |
| Emotional support | 64 |
| Practical support | 14 |
| Tasks and restrictions | 42 |
| Emotional and physical violence | 11 |

Material support. Table 6 shows that the majority of the references to unequal treatment concern material support ($n = 75$), which includes eight sub-themes concerning financial support, education, clothes and items, valuable gifts, leisure interests, inheritances, and privacy. Respondents mentioned both events in which they received more support than a sibling and those in which siblings arguably received more support. For instance, one individual wrote: "I know that my father gives more financial support to me than to my siblings" (Female, 1979, 12_042). In contrast, another respondent answered:

“My oldest sister has always gotten everything she wants and our parents have financially supported her and her family a lot” (Female, 1973, 12_103). Mostly, the unequal material support concerns relatively low-priced items and clothes or small amounts of money. However, in some cases respondents have reported that one sibling has received some valuable object, e.g., a car or a boat, whereas others have received nothing or only cheaper items:

The most concrete example happened one Christmas when my brother received a summer house as a gift from our parents and I received underpants and a pair of socks (Female, 1971, 12_115).

Even though Finland is a Nordic welfare state wherein free education from elementary school to the university level is guaranteed to all citizens and the state provides universal study grants to all university and college students, there are still references in our data to parental unequal treatment related to education. In many cases, the discriminative support concerning educational issues was not directly financial. It did not involve parental contribution of more money or other financial help to one sibling’s education over the other. Respondents mention that often parents might have encouraged one sibling in his or her studies while other siblings have not been encouraged. For instance, one respondent described the situation as follows:

For some reason I was my parents’ pet. They trusted me more, for example, in school issues, than they trusted my other siblings and, thus, I was able to develop for myself better self-esteem and a higher degree of self-respect (Male, 1978, 12_139).

Of course, the aforementioned type of unequal parental treatment is similar to the category of emotional support, but we have classified it as financial support, since it might have included an indirect financial stake. Those who have received greater study support are also more likely to have received more financial support, for example to cover living costs, than their siblings who have not been encouraged to study as much.

Emotional support. In our data, parents’ unequal emotional support reveals itself in nine different ways: contact frequencies or spending time together, valuing, attracting parents’ interest, emotional backing, closeness or attachment, encouragement, favoring a sibling’s mate, solicitude, and trust. Differences in contact frequencies with parents arose within several comments. The reasons presented varied. For instance, one respondent described: “My mother has no contact at all with my sister because of her (i.e., my sister’s) sexual orientation” (Female, 1987, 12_151). Another respondent explained:

My mum and dad divorced when I was 3 years old. I have seen my dad maybe 10 times after that, and mum’s two children from the new marriage, one of them is already dead, were much more important to her than me. I am not bitter, things worked out just fine like this (Male, 1969, 12_171).

Respondents also mentioned that their parents have, in general, valued one sibling over the others: “My sister always received more appreciation than me concerning

everything she did” (Female, 1974, 12_066) and “[M]y brother was always right and our parents’ opinion was that everybody should follow his example” (Female, 1976, 12_007). In addition, respondents reported that one sibling may attract all the interest of the parents. Although some respondents pointed out that this is the case in adulthood, many more instances occurred in childhood: “My brother enjoyed being the center of attention and acted up all the time, I just went ‘with the tide’” (Male, 1980, 12_009). This might have led sibling relations to suffer not only in childhood but also during adulthood. Thus, unequal emotional support provided by parents may have long-term influences on their children in general and on sibling relations in particular.

Practical support. There are only two kinds of remarks concerning unequal parental treatment in the case of practical support. These sub-themes are discriminative grandparenting and unequal practical help. In four of five instances of practical support, there was no specification of the kind of practical help parents had given. Only one mentioned that parents had given help when one sibling has arranged parties, whereas no help to other siblings was provided in similar situations. There were nine respondents who reported that parents have provided a different amount of solicitude to grandchildren. For instance:

My mother looks after my sibling’s children more than my children, my mother cooks more often for my sibling’s family, invites them to dinner, buys clothes for my sibling’s youngest child – but mother does not do similar things for my family (Female, 1974, 12_113).

The biggest thing that niggles me is that my father looks after my sister’s son but he does not look after my children (Female, 1973, 12_086).

Tasks and restrictions. In our data, there were 42 mentions of unequally distributed tasks and restrictions. Most of these involved discipline. One respondent argued that: “Discipline was much harder in my sister’s case than in my case” (Male, 1975, 12_014). Unequal parental discipline manifests itself here in several ways. For instance, some pointed out that there were different upbringing methods between siblings in early childhood. Others, however, argued that different disciplinary approaches existed particularly in adolescence: “When we were younger my brother was permitted to stay out at night but my mother always tried to restrain my going out” (Female, 1978, 12_012).

Our data includes instances that explain how parents have pampered one sibling at the expense of other siblings. One respondent argues that pampering has happened especially in childhood but no longer in adulthood: “As a child, I was my father’s pet. In adulthood he has treated all siblings equally” (Female, 1974, 12_097). Sometimes individuals point out that pampering is one form of unequal parental behavior that has started when the pampered child was a small baby or a toddler but has continued into adulthood: “My parents pampered my brother and he is still being served” (Female, 1974, 12_024). In addition to the aforementioned examples, a couple of the respondents mentioned that unequal parental treatment has presented itself in the way that parents’ have supported the self-management of one sibling more than the others by placing different kinds of demands on siblings and different demands of responsibility.

Emotional and physical violence. In our text data, the smallest category is unequal parental emotional and physical violence. In the data, emotional violence manifested itself as name-calling, criticism, arguing, and yelling. Here are two examples: “My father has criticized my appearance and personality. I do not believe that he has criticized my brother’s appearance” (Female, 1983, 12_033) and “My mother always criticizes everything I do and supports my sister” (Female, 1973, 12_063). There were three mentions of physical violence in the text data. One mention concerned sexual harassment and the other two concerned smacking.

Discussion

In this study, we analyzed whether the degree of genetic relatedness between siblings plays a role in younger adults’ perception of unequal parental treatment among siblings and whether unequal parental treatment is associated with the quality of the relationship between full and half-siblings. In addition, we explored the ways in which unequal parental treatment presents itself.

We found that respondents whose sibling sets include half-siblings have encountered more unequal maternal treatment than respondents who have full siblings only. As we excluded those respondents who indicated their mother or father to be a step-parent, the results indicate that respondents’ biological mothers had treated the siblings unequally. Thus, it might be that perceived unequal maternal treatment among sibling sets including half-siblings is due to the intensified mother-offspring conflict in cases where a younger maternal half-sibling has arrived (Schlomer et al., 2010). This may convert to differential allocation of maternal resources, which in turn appears for the offspring as unequal maternal treatment.

We also found that the degree of siblings’ genetic relatedness as well as perceived unequal parental treatment both correlated with the relationship quality between siblings as measured by emotional closeness. Co-residence and maternal perinatal association are known to be kin detection mechanisms in humans (Lieberman, Tooby, and Cosmides, 2007) and, thus, it can be expected that the relationship between those half-siblings who have probably lived together in childhood (maternal half-siblings) would not diverge from the relationship between full siblings. Contrary to this theoretical assumption, we found that maternal half-sibling relations as well as paternal half-sibling relations diverge clearly from full sibling relations, which were the closest. However, as the stepwise multilevel models show, and the Sobel z -test verifies, the perceived unequal parental treatment mediates the difference in relationship quality between maternal half-siblings compared to full siblings. Thus, in light of these results, we may consider if the well-known difference in sibling relationships between full and maternal half-siblings (e.g., Pollet, 2007; Tanskanen and Danielsbacka, 2014) is in part due to biological parents’ unequal treatment of those siblings.

Our qualitative analysis reveals that although unequal parental treatment may present itself in various ways, in many cases it is associated with the unequal distribution of parental resources. We found five ways that unequal parental treatment presented itself, and three of these were indisputably related to financial, practical, or emotional resources. This is in line with the assumption that siblings compete with each other for parental resources (Trivers, 1974). However, we also found that, in some cases, unequal parental treatment

takes such negative forms as name calling or physical violence. In addition, our qualitative analysis reveals that unequal parental treatment experienced in childhood appears to remain with a person.

Our study contains some limitations. We assumed that childhood co-residence and equal parental treatment serve as a way to detect more closely related siblings from other non-related or more distantly related peers, and therefore the availability of these cues may also affect the quality of a sibling relationship. However, there may also be some other kin detection mechanisms for which we were not able to control (see e.g., Antfolk et al., 2014). For example, one may be the facial or personality resemblance which can be assumed to be greater in the case of full than half-siblings.

Other limitations include the lack of exact information about which parent the respondents were referring to in blended families. It is well-known that stepparents may treat their own and stepchildren differently (e.g., Anderson, 2005; Gurven, Allen-Arave, Hill, and Hurtado, 2001; Gurven, Hill, Kaplan, Hurtado, and Lyles, 2000; Ivey, 2000; Tiffret, Jorev, and Nasanovitz, 2010). Respondents from divorced families might have thought about either their own non-residing biological parent or their step-parent who has lived in the same household with them during childhood while answering the question about unequal parental treatment. However, we believe we were able to control this uncertainty by excluding those respondents ($n = 26$) who defined either one of their parents a step-parent, and thus we may fairly reliably assume that the parent respondents are referring to is their biological parent.

In the survey, the formulation of the unequal treatment question was unclear because it did not take into account which sibling (i.e., the respondent or one of his or her full or half-siblings) has suffered from unequal parental treatment. This may be the reason why some control variables (e.g., birth order) were not correlated with dependent variables in either of the analyses, even though they should have been given previous studies (see e.g., Rohde et al., 2003; Salmon, 1999, 2003; Salmon and Daly, 1998). Finally, there is also the question of how well a research sample from one Western country is generalizable to any other population (e.g., Henrich, Heine, and Norenzayan, 2010). In this study, we have used a representative sample of younger adults in Finland. However, while studying unequal parental treatment, representative data from several different countries are needed.

Our study shows also that there is need for further studies. Larger data samples will be needed to explore whether unequal maternal or paternal treatment differs in different sibling set compositions, for instance, between those who have full siblings only, maternal half-siblings only, paternal half-siblings only, maternal and paternal half-siblings only, or full siblings and at least one half-sibling. Future studies should also investigate whether unequal parental treatment manifests itself differently in the case of full siblings than in the case of maternal or paternal half-siblings. In addition, we will need larger data samples to explore exactly how the presentation of unequal maternal and paternal treatment differs and whether the presentation of unequal parental treatment diverges according to siblings' gender. The unequal parental treatment and its effect on full versus maternal or paternal half-sibling relations should also be studied within small children because, as we saw in our qualitative analysis, the unequal parental treatment encountered in childhood remains in mind until adulthood.

Since we do know from previous studies that unequal parental treatment impairs sibling relations as well as children's development (e.g., Coldwell Pike, and Dunn, 2008;

Shanahan, McHale, Crouter, and Osgood, 2008), the results reported in this study provide important implications for parents. The equal treatment of all children needs more attention in new family constellations because it is clearly more common for those who have half-siblings to have encountered unequal parental treatment.

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