



This is a self-archived – parallel-published version of an original article. This version may differ from the original in pagination and typographic details. When using please cite the original.

AUTHOR Tanskanen Antti O., Danielsbacka Mirkka

TITLE Aunts and Uncles

BOOK Oxford Handbook of Evolutionary Psychology and Parenting

YEAR 2021

DOI [10.1093/oxfordhb/9780190674687.013.22](https://doi.org/10.1093/oxfordhb/9780190674687.013.22)

VERSION Final draft

CITATION Tanskanen, A.O. & Danielsbacka, M. (2021). Aunts and Uncles. In Shackelford, T.K. & Weekes-Shackelford, V. (Eds.) *The Oxford Handbook on Evolutionary Psychology of Parenting*. Oxford University Press.

Tanskanen, A.O. & Danielsbacka, M. (2021). Aunts and Uncles. In Shackelford, T.K. & Weekes-Shackelford, V. (Eds.) *The Oxford Handbook on Evolutionary Psychology of Parenting*. Oxford University Press.

## 20 Aunts and Uncles

Antti O. Tanskanen and Mirkka Danielsbacka

This chapter studies the behavior of one specific group of extended family members, namely aunts and uncles. Aunts and uncles typically belong to the same generation as the children's parents, but obviously the relations between aunts and uncles and their nieces and nephews are very different compared to parent–child relations. This is due to the fact that aunts and uncles are seldom the main caregivers of their nieces and nephews, and in contemporary Western societies, they rarely live in the same household as them. That said, however, noncoresiding aunts and uncles can serve as important alloparents for children and are often highly committed to the lives of their nieces and nephews, providing, for instance, social support, friendship, mentoring, and role models. The chapter then outlines key evolutionary theories of intergenerational family relations explaining the behavior of aunts and uncles. It also considers the investment of aunts and uncles in contemporary affluent societies.

extended family, aunts, uncles, alloparents, intergenerational family relations, evolutionary theories

For decades, the investment that extended family members make in their descendants has been of great interest among evolutionary scientists. Broadly speaking, evolutionary studies on the extended family can be divided into two branches: evolutionary ecology and evolutionary psychology, which share the same theoretical framework (Tanskanen & Danielsbacka, 2019). Evolutionary ecology or human behavioral ecology is typically interested in the potential outcomes of the investment made by the extended family (i.e., whether the kin investment is associated with fertility or child survival). Evolutionary psychology, in turn, tends to be interested in the psychological dispositions underlying human behavior and, with regard to the extended family, the factors shaping kin investment. Here, both the asymmetries in kin investment as well as the outcomes of such investment are considered. The term kin investment is used herein as a general term for all material and nonmaterial support that extended family members provide for descendants either directly or indirectly via the parents of small children. These investments may include, for instance, contact frequency, child care, financial transfers, emotional support, and practical help.

This chapter considers the behavior of one specific group of extended family members, namely aunts and uncles. Aunts and uncles typically belong to the same generation as the children's parents, but obviously the relations between aunts and uncles and their nieces and nephews are very different compared to parent–child relations. This is due to the fact that aunts and uncles are seldom the main caregivers of their nieces and nephews, and in contemporary Western societies they rarely live in the same household as them. That said,

however, noncoresiding aunts and uncles can serve as important alloparents for children and are often highly committed to the lives of their nieces and nephews, providing, for instance, social support, friendship, mentoring, and role models. Thus, aunts and uncles belong to a group of individuals that can be termed “very important nonparental persons” (VIPs) for children (Chang et al., 2010). Despite this, aunts and uncles have received relatively little attention among family scientists, leading one family sociologist to dub them “the forgotten kin” (Milardo, 2010).

In evolutionary studies, aunts and uncles are sometimes contrasted with grandparents because the former share approximately the same proportion of genes with their nieces and nephews as grandparents share with their grandchildren, namely 25%. What this means is that, from an inclusive fitness perspective (Hamilton, 1964), the reasons that aunts and uncles have for investing time and other resources in their nieces and nephews could be quite similar to the reasons grandparents have for investing in their grandchildren. However, there are several reasons why the role of aunts and uncles may differ substantially from that of grandparents. For example, aunts and uncles belong to a different family generation than grandparents, meaning that these two groups of extended family members are typically going through different life stages. When nieces and nephews are young, aunts and uncles often have their own children or are able to have children in the future, whereas grandparents do not usually have young children and will not have any further offspring. In contrast to grandmothers and grandfathers from the same lineage, in present-day Western societies aunts and uncles are unlikely to live in the same households as one another, meaning that the investment made by aunts and uncles is more independent than that made by grandparents. Thus, studies examining the behavior of aunts and uncles can provide more robust answers to several evolutionary hypotheses compared to studies focusing on the behavior of grandparents.

The structure of this chapter is as follows. We first provide a brief overview of key evolutionary theories of intergenerational family relations explaining the behavior of aunts and uncles. After that, we introduce studies exploring the role of aunts and uncles in traditional and historical populations. Subsequently, the investment of aunts and uncles in contemporary affluent societies is considered. Lastly, the limitations of prior studies are discussed and themes for future research are provided.

### Theories Concerning the Biased Investment of Aunts and Uncles

Based on evolutionary theory, individuals are expected to channel their investment of time and resources in kin in line with their reproductive interests. From a reproductive perspective, three important factors that should divide the investment that aunts and uncles make toward their nieces and nephews are genetic relatedness, sex, and lineage. In the next section, evolutionary theories predicting biased kin investments are briefly discussed.

Inclusive fitness theory (Hamilton, 1964), also known as kin selection theory and Hamilton’s rule, is used to explain the behavior of many species in addition to humans, including eusocial insects, birds, and primates. Inclusive fitness theory can be represented by the formula  $B \times r > C$ , where  $B$  signifies benefit to the recipient,  $r$  is the degree of relatedness

between the recipient and contributor, and  $C$  is the cost to the contributor. In terms of one's inclusive fitness, it is beneficial to help close relatives even if the costs are high because the relatedness is also high, but helping more distant relatives with high costs is less beneficial. According to Hamilton's rule, an individual can enhance his or her inclusive fitness by supporting his or her close relatives' reproductive success (indirect fitness) at the expense of his or her own direct fitness. In addition, due to the reproductive value of the receiver, investments are predicted to go toward younger rather than older generations (Hughes, 1988). During the last half century, the predictions of inclusive fitness theory have been widely investigated within several disciplines, and the theory has helped in enhancing understanding of a wide range of phenomena among humans and nonhuman animals (Abbot et al., 2011).

According to the theory, the closer the kin relationship (or the more individuals have reason to believe that they are genetically related to one another), the more individuals will provide altruistic help. When it comes to aunts and uncles, the average proportion of shared genes between them and their nieces and nephews is 25%. Average relatedness to nieces and nephews who are monozygotic twins is even higher, and in fact is the same as relatedness to one's own children, namely 50%, whereas the average proportion of shared genes with nieces and nephews from half siblings is 12.5%.

Many of the emotions embedded in family ties are linked to shared genes, and the presence of nieces and nephews tends to increase the shared reproductive interests between siblings (Hughes, 1988). However, if people have both their own children and siblings' children, they are still more closely bonded to their own children than their nieces and nephews (Hamilton, 1964). As resources are always limited, people with their own children may not be able to invest in their nieces and nephews as much as childless individuals (Pollet et al., 2006). Moreover, siblings are often close in age, and in low-resource environments in particular, simultaneous reproduction may lead to resource competition between them, meaning that in some circumstances the presence of aunts and uncles may have detrimental effects on their nieces and nephews (Sear & Mace, 2008).

Evolutionary scholars have noted that in humans, as in several other species, paternity uncertainty may influence the investment that individuals channel toward their kin (Geary, 2007; Platak & Shackelford, 2006). Paternity uncertainty (also termed relationship uncertainty) means that human fathers can never be certain that their child is genetically related to them. In contrast, mothers, who by virtue of the fact that they give birth to their offspring, are certain of their genetic relatedness to the child. Evolutionary researchers argue that paternity uncertainty is an adaptive problem for human males and thus there could be psychological adaptations that regulate investment in offspring according to paternity uncertainty. In line with this argument, studies have shown that men tend to invest more resources in children with facial and odor resemblance to them; that is, men invest more in children to whom they are more likely to be genetically related (Alvergne et al., 2009; Anderson et al., 1999; Burch & Gallup, 2000; Daly & Wilson, 1982). Evolutionary scientists have also postulated that paternity uncertainty shapes the investment behavior of extended kin, including aunts and uncles.

In the case of aunts and uncles, paternity uncertainty means that maternal aunts and uncles can be certain that their sisters' children are genetically related to them, while their paternal counterparts cannot claim the same certainty about their brothers' children. Based on predictions derived from paternity uncertainty, other things being equal, it is assumed that maternal aunts and uncles invest more in their nieces and nephews than do paternal aunts and uncles (Euler & Michalski, 2008). When kin investment is considered from an evolutionary perspective, it is important to note that asymmetrical investment in kin is often made without conscious decisions (Euler, 2011). The unconscious nature of a biased kin investment is important to note because in many if not most cases, individuals do not "choose" a particular niece or nephew to favor, for instance. Despite this, asymmetrical investment in nieces and nephews is documented in several prior studies (e.g., Gaulin et al., 1997; Pashos & McBurney, 2008).

Two alternative explanations for the biased investment of aunts and uncles are the sex effect and the matrilineal effect, which partly overlap with and partly challenge the hypothesis based on paternity uncertainty (Rotkirch, 2018). Due to several factors, including pregnancy, lactation, paternity uncertainty, and sociocultural traditions, humans typically follow sex-specific reproductive strategies. According to these strategies, women have a greater obligatory investment in their children than men have, also leading individuals to invest more in their female rather than male kin (Euler, 2011). This matrilineal effect predicts that people should invest more in their sisters' children (maternal nieces and nephews) than their brothers' children (paternal nieces and nephews). In addition, based on the sex effect, women are expected to invest more time and resources in their kin than men in all cases because of the greater caregiving tendencies of women (Pashos, 2017). Thus, according to the sex effect, aunts should invest more in their nieces and nephews than uncles.

### Empirical Findings on Biased Investments by Aunts and Uncles

In this section, we review studies on asymmetrical investments by aunts and uncles. First, the role of genetic relatedness in shaping the kin investment behavior is considered. Subsequently, we investigate how sex and lineage are associated with kin investment. Lastly, attention is paid to different socioecological factors potentially influencing the investment that aunts and uncles channel toward their nieces and nephews.

#### Genetic Relatedness

Individuals share on average 25% of their genes with their nieces and nephews via full siblings, and 12.5% of their genes with nieces and nephews via half siblings. Thus, based on inclusive fitness theory (Hamilton, 1964), one may predict that individuals will invest more time and resources in their full siblings' than their half siblings' children (Pollet & Hoben, 2011). In concordance with the theory, previous studies have indicated that the relationship between full siblings is closer than the relationship between half siblings (e.g., Pollet, 2007; Tanskanen & Danielsbacka, 2014). This has been shown to be the case even in a Mormon population, where traditional values are strongly against favoring full siblings over half siblings (Jankowiak & Diderich, 2000). However, previous studies investigating whether

individuals invest more time and resources in nieces and nephews via full or half siblings are scarce.

Associations between genetic relatedness and contact frequencies between aunts and uncles and their nieces and nephews were investigated using two-generational survey data from Finland (Tanskanen & Danielsbacka, 2014). Kin investment was indicated by contact frequency, which is assumed to be a good proxy for overall investment because several other types of investment (e.g., child care and emotional support) need some sort of contact. In this study, maternal aunts and uncles were separated from paternal ones because in Finland children in a large majority of cases stay with their mothers if parents get divorced, meaning that individuals who share the same mother usually spend their childhood together with their half siblings, while this is not the case with individuals who share the same father. In turn, childhood proximity is likely to influence kin relations in adulthood in that individuals should invest more in their nieces and nephews via maternal half siblings than paternal half siblings. In line with inclusive fitness theory (Hamilton, 1964), it was found that respondents reported more contact with their nieces and nephews via full rather than half siblings. Moreover, more contacts were reported with the children of maternal rather than paternal half siblings. Lastly, in line with the sex effect hypothesis, more contacts were reported with nieces and nephews via sisters than brothers. Two previous studies have used twin data to investigate the rate of emotional closeness reported by aunts and uncles toward their nieces and nephews (Segal & Marelich, 2011; Segal et al., 2007). Twin studies can provide unique information on how genetic relatedness shapes intergenerational relations because monozygotic (MZ) twins share 100% of their genes, meaning that they are “genetic parents” to their nieces and nephews who, correspondingly, are “genetic children” to their aunts and uncles. In contrast, dizygotic (DZ) twins are related to their nieces and nephews in a similar way to the children of any other full siblings, making them an important control group. Importantly, both MZ and DZ twins have usually been raised together and hence they have grown up in a shared environment. In their study, Segal and Marelich (2011) analyzed data including 248 MZ twins and 75 DZ twins. Their analyses were based on reports to a closeness questionnaire in which they asked aunts and uncles how close their relationship was with a specific niece or nephew via 12 items (e.g., do they like being with their niece or nephew, and how close do they feel to their niece or nephew). In line with inclusive fitness theory, the authors found that MZ twins expressed greater closeness toward their nieces and nephews compared to DZ twins. Later, an updated study by the same authors with a larger sample including 419 twins found similar results (Segal & Marelich, 2011).

### Sex and Lineage

Evolutionary researchers assume that aunts and uncles will invest in their kin in line with their reproductive interests. In addition to genetic relatedness, two important factors from a reproductive perspective that are expected to divide investment toward nieces and nephews are sex and lineage. As a result of paternity uncertainty, maternal aunts and uncles are posited to invest more in their kin than paternal aunts and uncles, and aunts more than uncles (Euler & Michalski, 2008). In recent decades, the biased investment of aunts and uncles has largely been studied with data collected from college students.

One of the first such investigations was a study analyzing a sample of 285 Pittsburgh college students (Gaulin et al., 1997) who were asked to report how much concern aunts and uncles had shown toward the respondents' welfare. In the study, only biological relations were included and aunts and uncles were carefully separated from each other by sex and lineage. The authors also considered that the phrase "concern about welfare" can bias the responses. For instance, if one has only paternal aunts or uncles, he or she may report higher rates of concern by paternal kin compared to those having both paternal and maternal aunts and uncles, because the first group has no reference category for the purpose of comparison (i.e., they do not have maternal aunts or uncles who can invest more than paternal ones). Thus, only respondents with both maternal and paternal relatives were included in the analyses. In line with a prediction based on paternity uncertainty, the Pittsburgh college students reported that maternal aunts and uncles showed more concern about their welfare compared to paternal aunts and uncles.

The researchers replicated their Pittsburgh study by conducting a similar survey for Orthodox Jewish college students (McBurney et al., 2002). In this population, infidelity in marriage is highly discouraged, leading to an assumption that paternity uncertainty should not play an important role among its members. When comparing the "concern of welfare" of aunts and uncles between Pittsburgh and Orthodox Jewish samples, it was found that the results were quite similar. Based on this lack of difference between the populations, the authors claimed that the biased investment by aunts and uncles could reflect the paternity uncertainty in human evolutionary history rather than in present-day societies.

In several studies, the kin investment by aunts and uncles has been studied from the perspective of nieces and nephews. Nieces and nephews may report the investment made by aunts and uncles more reliably than the latter, whose reports in turn can be biased because aunts and uncles may claim that they treat all nieces and nephews equally. This could be the case, in particular, in societies that strongly favor all kin members being treated equally. However, the fact that in previous studies information about the investment of aunts and uncles is mostly gathered from the perspective of nieces and nephews rather than aunts and uncles could also be a significant limitation. This is because nieces and nephews tend to have limited knowledge of background characteristics related to their aunts and uncles, and hence in these studies several potentially confounding factors could be missing.

To avoid this limitation, the investment behavior of aunts and uncles was investigated with large-scale data where aunts and uncles reported their investment toward nieces and nephews (Tanskanen & Danielsbacka, 2017a). The participants represented older adults (born between 1945 and 1950) and younger adults (born between 1962 and 1993) from Finland, with kin investment being measured by contact frequency. First, it was found that individuals reported more contact with their sisters' than their brothers' children. This finding was in line with an evolutionary prediction based on paternity uncertainty and also supported the findings from previous small-scale studies. Next, the preferential investment in more certain kin hypothesis was examined (Laham et al., 2005). In the case of aunts and uncles, the preferential investment hypothesis predicts that if aunts and uncles have the option to invest in both their sisters' and their brothers' children, they will invest more in the former than the latter. In accordance with the hypothesis, it was found that when

individuals had nieces and nephews via sisters and brothers, they invested more in their sisters' children.

#### Other Factors Associated with Investment by Aunts and Uncles

In addition to genetic relatedness, sex, and lineage, there are several other features that may shape kin investment by aunts and uncles. These factors could be related to the characteristics of aunts and uncles themselves as well as to the characteristics of nieces and nephews or their parents (i.e., aunts and uncles' siblings). Next, we will consider several such factors that have been found to be associated with the investment of aunts and uncles. It is well-known that kin relationships vary throughout the life course. From the perspective of aunts and uncles, an important factor potentially shaping their behavior is the existence of their own children. Individuals share 50% of their genes with their own children and 25% with their nieces and nephews via full siblings, meaning that, from an inclusive fitness perspective (when other factors are equal), it is more beneficial to invest resources in one's own children rather than nieces and nephews. In line with this prediction, previous evidence has indicated that childless women tend to invest more in their nieces and nephews compared to mothers (Pollet et al., 2006; Tanskanen, 2015). Moreover, it could be that by investing in their nieces and nephews earlier in life, childless aunts and uncles may avoid social isolation in later life (Wenger et al., 2000).

Having a spouse could be a factor because it increases the likelihood of having children in the future, meaning that when individuals have a spouse they may be willing to invest more in their future reproduction rather than support their siblings in their reproductive-related efforts. This could be the case at least among those childless aunts and uncles who still have a high probability of having children in the future. Fertility declines with increasing age among both males and females, but males can potentially have children until they die, while females cannot conceive once they reach the postmenopausal stage. As age is related to an individual's reproductive prospects, older aunts who are beyond their fertile years, in particular, may gain fitness benefits by investing in their nieces and nephews (Lahdenperä et al., 2012). In contrast, if aunts and uncles are themselves at a younger age and can potentially have children in the future, they may be willing to invest more in having their own children rather than investing in their extended kin (Hughes, 1988).

The age of nieces and nephews could be a factor not least because younger children typically need more support than older ones (Tanskanen & Danielsbacka, 2019). Once again, for childless older aunts and uncles, investments made in their nieces and nephews with high reproductive potential could be the best strategy to increase their own inclusive fitness. In practice, the reproductive value of nieces and nephews tends to be highest when they are at the beginning of their reproductive career because at that time they are most fertile and have the most time to have children.

The number of siblings as well as the number of siblings with children (i.e., nieces and nephews) may also influence the level of investment by aunts and uncles. As time and other resources of aunts and uncles are always limited, every new kin member is likely to diminish the opportunities to invest in other relatives (Euler & Michalski, 2008). If aunts and uncles have nieces and nephews via several siblings, they could be forced to choose in whom they

will and will not invest. Although the total number of nieces and nephews may also make a difference, it has been shown that the number of “niece and nephew sets” (i.e., nieces/nephews via a certain sibling) one has matters more (Euler, 2011). For instance, support has been found for the dilution effect, meaning that those aunts and uncles who had nieces and nephews via several siblings invested less time in their descendants (Tanskanen & Danielsbacka, 2017a).

One of the most robust findings in the kin investment literature is that geographical distance tends to shape the investment behavior of individuals. When the geographical distance between kin increases, the opportunities to see one another decrease correspondingly. Somewhat surprisingly, however, studies have shown that not only face-to-face contact but also interaction that does not require physical contact tends to decrease with increasing geographical distance (e.g., Tanskanen & Danielsbacka, 2017b). Overall, studies have shown that when aunts and uncles live further away from their nieces and nephews, the degree of investment is lower (e.g., Tanskanen & Danielsbacka, 2014). The socioeconomic position of aunts and uncles is also related to their behavior, and it has been shown that higher educated aunts and uncles have more contact with their nieces and nephews compared to their lower educated counterparts (e.g., Pollet, 2007; Tanskanen & Danielsbacka, 2014).

Lastly, the relationship quality that aunts and uncles have with their siblings may influence the contact frequency with nieces and nephews. In practice, parents can act as “gatekeepers” in that they may either facilitate or prevent interaction with relatives. If a good rapport exists between aunts and uncles and their siblings, it is likely that the former will be involved in the lives of their nieces and nephews. However, if there are severe conflicts between aunts and uncles and their siblings, in the worst case it may result in the former having no contact with their nieces and nephews at all. A prior study found that the relationship quality between aunts and uncles and their siblings is indeed related to the degree of interaction between aunts and uncles and nieces and nephews (Tanskanen & Danielsbacka, 2017a). It was found that when the emotional closeness between aunts and uncles and their siblings increased, so did the contact frequency between aunts and uncles and nieces and nephews.

### Outcomes of the Investment by Aunts and Uncles

As the previous section points out, aunts and uncles are often involved in the lives of their nieces and nephews. Whether their involvement benefits their nieces and nephews is another question, however. In this section, we first review studies that have analyzed whether aunts and uncles have contributed toward increasing the fertility of their siblings and helped to improve the survival rates of nieces and nephews in historical and traditional societies. Second, we introduce studies aimed at identifying whether aunts and uncles can improve the well-being of nieces and nephews in contemporary societies.

### Aunts and Uncles in Traditional and Historical Populations

The question of whether the presence of kin influences people’s fertility decisions and child survival in traditional and historical populations has received considerable attention among

evolutionary scientists. The term traditional and historical societies refers to natural fertility and mortality populations without modern medical care, contraceptive technology, or welfare services (Kramer, 2010). In traditional and historical populations, the kin effect is typically measured by the presence of kin in the same household or the same village (Sear & Mace, 2008). The use of kin presence as a proxy for kin investment is based on the fact that when kin live closer to one another, they also have a higher likelihood of interacting. This has particularly been the case in traditional and historical populations with limited opportunities to travel long distances.

Although it has been shown that kin presence may influence individuals' reproductive decisions in traditional and historical populations, studies exploring the association between the presence of sisters or brothers (who will be the young children's aunts or uncles) and fertility are relatively rare (Sear & Coall, 2011; Sear & Mace, 2008), partly because of the lack of suitable data. One of these rare studies investigated whether household composition plays a role in childbearing behavior by using historical data from the Netherlands between 1842 and 1920 (Rotering & Bras, 2015). It was found that the presence of fathers' brothers (i.e., paternal uncles) was associated with an increased probability of having a third, fourth, and fifth child. In addition, the presence of mothers' brothers (i.e., maternal uncles) correlated with an increased likelihood of having a second, third, and fourth child. Living with sisters (who are maternal aunts to children) was not associated with increased or decreased parity progression. These findings indicate that the extra resources brought to a household by uncles in particular may influence individuals' reproductive decisions. Using demographic data from historical Finland, it was found that the presence of elder opposite-sex siblings correlated with increased lifetime reproductive success, and the presence of elder same-sex siblings with decreased lifetime reproductive success (Nitsch et al., 2013). This indicates that reproductive rivalry could exist among same-sex siblings. Another study that also used data from preindustrial Finland likewise found reproductive rivalry between unrelated sisters-in-law (Pettay et al., 2016). Overall, the costs and benefits related to the presence of relatives tend to be highly dependent on cultural practices (Pettay et al., 2017).

In addition to reproduction, child survival is a key component of fitness, and it has been estimated that in our evolutionary history fewer than 50% of children reached adulthood and were able to have their own children (Wells & Stock, 2007). Whether kin presence is associated with improved survival rates of children in traditional and historical societies is an important question that has been investigated by several evolutionary scholars (Sear & Mace, 2008). However, studies on whether the presence of aunts and uncles, in particular, is associated with improved survival of nieces and nephews are scarce and have produced mixed results. Although Heath (2003) found that the presence of maternal aunts and uncles as well as paternal aunts was associated with increased infant survival among Mormons in Utah in the 1900s, several other studies have not detected a similar association (e.g., Derosas, 2002; Hill & Hurtado, 1996). One of the most comprehensive studies on the topic used historical data from preindustrial Finland and investigated whether nonreproductive aunts and uncles benefit their nieces and nephews (Nitsch et al., 2014). It was found that the presence of older childless uncles was associated with slightly higher survival rates of nieces, while the presence of younger childless uncles correlated with decreased survival rates of nephews, and the presence of older childless aunts was associated with decreased

survival rates of nieces. In contrast to predictions derived from inclusive fitness theory, the Finnish study did not find convincing evidence indicating that the presence of childless aunts and uncles improved the survival of their nieces and nephews.

Prior studies have also indicated that the effects that aunts and uncles may have on child survival could be dependent on the availability of local resources. Decreased resources can be predicted to point to an increased rate of kin competition. Borgerhoff Mulder (2007) studied data on Kipsigis agropastoralists from Kenya, taking the household resources into account, and found that paternal uncles improved the survival of young children, particularly in wealthy households. This finding may be related to the fact that in richer households brothers engage in more cooperation and less competition over local resources than in poorer households, which may also lead paternal aunts to buffer children against mortality. Among the matrilineal Chewa population in Malawi, it was found that the presence of maternal aunts was associated with increased child survival in those rare cases in which men-owned resources (Sear, 2008). However, the presence of maternal aunts was associated with lower survival rates of children in cases where women-owned resources, which could be explained by resource competition among maternal relatives.

To conclude, siblings are often close in age and when they are of childbearing age they can help one another with child care, provide reciprocal material support, and assist in everyday issues. However, when siblings reproduce simultaneously, they may be more concerned about having their own children rather than supporting their siblings' reproductive efforts. In addition, when siblings simultaneously have small children, the welfare of their own children tends to be more important than the welfare of their nieces and nephews. Thus, in low-resource environments, simultaneous reproduction may lead to resource competition between siblings, which may influence both childbearing decisions and child survival. Hence, when one studies kin effects on fertility and child survival, it is important to take the household resources into account.

### Aunts and Uncles in Contemporary Societies

Kin presence may have played a role in fertility decisions in traditional and historical populations, as discussed earlier. Studies have found that kin may influence each other's childbearing decisions in contemporary Western societies as well. For instance, using data from present-day Britain, it was found that those females who have more relatives in their social networks had a higher likelihood of entry into motherhood compared to females who had fewer relatives in their social networks (Mathews & Sear, 2013). A number of studies have also investigated whether support received from older parents (who are grandparents to the young children) is associated with fertility in contemporary societies (e.g., Aassve et al., 2012; Tanskanen et al., 2014; Waynforth, 2011), but studies on the potential effects of aunts and uncles on fertility have been scarce. One such rare study using register data from Sweden showed that aunts and uncles can "transmit" their fertility behavior to nieces and nephews (Kolk, 2014). Based on this study, the mechanisms explaining the intergenerational transmission of fertility are rooted in the transmission of the preferred number of children as well as similarity in values, socioeconomic status, and educational level.

Several studies have detected an association between the number of siblings and family size. For instance, a recent study from Germany indicated that a greater number of siblings is associated with a greater number of children (Buhr et al., 2018). Moreover, using register data from Norway, it was found that siblings have a strong influence on women's entry into motherhood but a weaker influence on second births (Lyngstad & Prskawetz, 2010). In addition to actual childbearing, siblings can influence other outcomes, which could be important from a reproductive perspective. For instance, it has been shown that older siblings can influence the timing with regard to when their younger siblings start engaging in sexual intercourse (Haurin & Mott, 1990), and siblings may exert even more influence on adolescents' sexual development than their peers (Rodgers & Rove, 1993).

When it comes to child well-being, studies from traditional and historical populations have explored whether the presence of aunts and uncles is associated with improved survival of nieces and nephews, as discussed earlier. In contemporary affluent societies with low rates of child mortality, relatives are not required to keep small children alive in the same way as in traditional and historical populations. For this reason, it is also argued that the outcomes of kin investment should no longer be measured by child survival but rather by some "softer" outcomes such as child psychological well-being, early-years development, or academic success (Sear & Coall, 2011). Studies concerning grandparental investment have indeed shown that the investment of extended kin is often associated with improved child outcomes, although it is not clear whether this association is causal (Tanskanen & Danielsbacka, 2019). However, there is a lack of research investigating the association between the investment of aunts and uncles and the outcomes of nieces and nephews. An interesting set of studies has examined whether aunts and uncles can transmit their socioeconomic status to nieces and nephews. It has been known for decades that parental socioeconomic characteristics (i.e., educational level, occupational status, and income) correlate with those of their children (e.g., Becker & Tomes, 1986; Bourdieu, 1977; Ganzeboom et al., 1991; Hout & DiPrete, 2006). However, it is only recently that social mobility scholars have started to study whether aunts and uncles can have a "direct effect" on the status of nieces and nephews (although these studies provide only limited evidence for causal associations) (e.g., Jæger, 2012; Lehti & Erola, 2017). In practice, scholars have investigated whether the higher socioeconomic status of aunts and uncles correlates with the higher status of nieces and nephews after the socioeconomic status of their own parents is taken into account. It has been assumed that aunts and uncles can play an important role in status attainment in present-day societies because the increased divorce rate may reduce the direct effect of parents. Moreover, due to the increased number of childless people in contemporary Western societies, there are more aunts and uncles without their own offspring, potentially providing them with a greater opportunity to influence the lives of their nieces and nephews.

There are several reasons for positing that different types of aunts and uncles can have a different effect in the case of status transmitting, with the most important differences possibly being based on two evolutionarily important factors, namely sex and lineage. As discussed earlier, aunts typically invest more in their nieces and nephews than uncles, and people tend to invest more in sisters' children than brothers' children. Based on these sex biases, it could be predicted that the status of aunts could be more important than the status of uncles, and the status of maternal aunts or uncles more important than that of

paternal aunts or uncles. Providing support for lineage-based differences, a recent study that used population register data from Finland showed that the high educational level of maternal aunts and uncles tends to compensate for the low educational level of parents, while a similar effect was not found among paternal aunts or uncles (Lehti & Erola, 2017). Moreover, studies have shown that it is important to take the household and extended family resources into account. Again, using register data from Finland, a recent study found that the higher status of aunts and uncles can decrease the risk of marginalization of nieces and nephews in cases where both parents and grandparents have low socioeconomic resources (Erola et al., 2018).

## Conclusions

This chapter has reviewed studies concerning the investment by aunts and uncles in their nieces and nephews and the potential outcomes of this investment. When it comes to kin investment patterns, aunts tend to invest more in their nieces and nephews compared to uncles, while maternal aunts and uncles tend to invest more than their paternal counterparts. In addition to sex and lineage, genetic relatedness has been shown to shape the behavior of aunts and uncles. The latter have more contact with their nieces and nephews via full rather than half siblings, and identical twins feel closer to their nieces and nephews than nonidentical twins. These asymmetrical investments by aunts and uncles are in line with evolutionary predictions based on inclusive fitness theory and its extensions. Studies exploring the outcomes of the investment of aunts and uncles have produced mixed results. Some studies from traditional and historical societies have found that kin presence improves fertility and child survival, while others have not found such an effect, and some have even discovered the opposite, namely that the presence of aunts and uncles is associated with decreased fertility or child survival as a result of resource competition between kin. Thus, it seems that the likelihood of the presence of aunts and uncles being associated with fertility or child survival tends to be related to household resources and other contextual factors. Studies from contemporary societies have shown that aunts and uncles may transmit their fertility behavior and socioeconomic success to their nieces and nephews. However, it is important to note that studies examining the outcomes of the investment by aunts and uncles in present-day societies have been scarce. For instance, there is a lack of studies looking into whether the investment by aunts and uncles is associated with the improved development, psychological well-being, or educational success of nieces and nephews in contemporary societies.

Traditionally, family scientists have paid relatively little attention to aunts and uncles (Milardo, 2010), meaning that our knowledge of their role in human families is rather limited. Hence, there are several important issues that have not been studied at all, or that have been underresearched. Next, we introduce some themes that merit closer attention and that should be investigated in future studies.

1. To provide a more nuanced picture about the investment of aunts and uncles, it is important to simultaneously consider the three evolutionarily important cornerstones (i.e., genetic relatedness, sex, and lineage) as well as different socioecological variables (e.g., health and geographical distance). In nongenetical kin relations (e.g., when aunts and uncles are investing in their stepsiblings' children) as

well as when the likelihood of relatedness decreases (e.g., as a result of paternity uncertainty in the case of different types of aunts and uncles), the investment may also become more dependent on other factors. For example, does increased residential distance between the kin diminish the investment of paternal aunts and uncles more than maternal ones? Moreover, does the poor health of aunts and uncles decrease the investment by non-genetically related aunts and uncles compared to genetically related ones?

2. Relationship quality between adult siblings could be an important factor influencing the behavior of aunts and uncles. In this vein, does improved relationship quality between children's parents and aunts and uncles increase the kin investment by the latter? Further, are these effects similar between different types of aunts and uncles?
3. The proximate kin detection cues may influence the behavior of aunts and uncles, but there is a lack of studies on this issue. For instance, how does facial resemblance, personality similarity, or proximity shape the investment by aunts and uncles? In addition, with regard to kin investment, are some kin detection cues more important than others? Furthermore, does the effect of resemblance vary between aunt and uncle types?
4. Prior studies on the investment by aunts and uncles have used rather cross-sectional data than longitudinal data. In light of this, how do the relationships between aunts and uncles and nieces and nephews change during the life course? Can childless aunts and uncles avoid social isolation by investing in their nieces and nephews? What is more, how does nieces' and nephews' own transition to parenthood shape the behavior of aunts and uncles?
5. The potential outcomes of the investment by aunts and uncles have rarely been studied in contemporary Western societies. To this end, does the kin support received increase the likelihood of the birth of nieces and nephews? Does the investment by aunts and uncles improve the development and well-being of nieces and nephews? Relatedly, does the investment by aunts and uncles improve the well-being of aunts and uncles themselves?

## References

Aassve, A., Meroni, E., & Pronzato, C. (2012). Grandparenting and childbearing in the extended family. *European Journal of Population*, 28, 499–518.

Abbot, P., Abe, J., Alcock, J., Alizon, S., Alpedrinha, J. A. C., Andersson, M., Andre, J.-P., van Baalen, M., Balloux, F., Balshine, S., Beukeboom, L. W., Biernaskie, J. M., Bilde, T., Borgia, G., Breed, M., Brown, S. Bshary, R., Buckling, A., Burley, N. T., Burton-Chellew, M. N. et al. (2011). Inclusive fitness theory and eusociality. *Nature*, 471, E1–E4.

Alvergne, A., Faurie, C., & Raymond, M. (2009). Father-offspring resemblance predicts paternal investment in humans. *Animal Behaviour*, 78, 61–69.

Anderson, K. G., Kaplan, H., & Lancaster, J. B. (1999). Paternal care by genetic fathers and stepfathers I: Reports from Albuquerque men. *Evolution and Human Behavior*, 20, 405–431.

- Becker, G. S., & Tomes, N. (1986). Human capital and the rise and fall of families. *Journal of Labor Economics*, 4, S1–S39.
- Borgerhoff Mulder, M. (2007). Hamilton's rule and kin competition: The Kipsigis case. *Evolution and Human Behavior*, 28, 299–312.
- Bourdieu, P. (1977). *Reproduction in education, society, and culture*. Sage.
- Buhr, P., Lutz, K., & Peter, T. (2018). The influence of the number of siblings on expected family size in a cohort of young adults in Germany. *Demographic Research*, 39, 315–336.
- Burch, R. L., & Gallup, G. G. Jr. (2000). Perceptions of paternal resemblance predict family violence. *Evolution and Human Behaviour*, 21, 429–435.
- Chang, E. S., Greenberger, E., Chen, C., Heckhausen, J., & Farruggia, S. P. (2010). Nonparental adults as social resources in the transition to adulthood. *Journal of Research on Adolescence*, 20(4), 1065–1082.
- Daly, M., & Wilson, M. I. (1982). Whom are newborn babies said to resemble? *Ethology and Sociobiology*, 3, 69–78.
- Derosas, R. (2002). Fatherless families in 19th century Venice. In R. Derosas & M. Oris. (Eds.), *When dad died: Individuals and families coping with distress in past societies* (pp. 421–452). Peter Lang.
- Erola, J., Kilpi-Jakonen, E., Prix, I., & Lehti, H. (2018). Resource compensation from the extended family: Grandparents, aunts, and uncles in Finland and the United States. *European Sociological Review*, 34, 348–364.
- Euler, H. A. (2011). Grandparents and extended kin. In C. A. Salmon & T. K. Shackelford (Eds.), *The Oxford handbook of evolutionary family psychology* (pp. 181–207). Oxford University Press.
- Euler, H. A., & Michalski, R. L. (2008). Grandparental and extended kin relationships. In C. A. Salmon and T. K. Shackelford (Eds.), *Family relationships: An evolutionary perspective* (pp. 230–256). Oxford University Press.
- Ganzeboom, H. B. G., Treiman, D. J., & Ultee, W. C. (1991). Comparative intergenerational stratification research: Three generations and beyond. *Annual Review of Sociology*, 17, 277–302.
- Gaulin, S. J. C., McBurney, D. H., & Brakeman-Wartell, S. L. (1997). Matrilateral biases in the investment of aunts and uncles: A consequence and measure of paternity. *Human Nature*, 8, 139–151.
- Geary, D. C. (2007). Evolution of fatherhood. In C. A. Salmon & T. K. Shackelford (Eds.), *Family relationships: An evolutionary perspective* (pp. 115–144). Oxford University Press.

- Hamilton, W. D. (1964). The genetical evolution of social behaviour (I and II). *Journal of Theoretical Biology*, 7, 1–52.
- Haurin, R. J., & Mott, F. L. (1990). Adolescent sexual activity in the family context: The impact of older siblings. *Demography*, 27, 537–557.
- Heath, K. M. (2003). The effects of kin propinquity on infant mortality. *Social Biology*, 50, 270–280.
- Hill, K., & Hurtado, A. M. (1991). The evolution of premature reproductive senescence and menopause in human females: An evaluation of the “grandmother hypothesis.” *Human Nature*, 2, 313–350.
- Hout, M., & DiPrete, T. A. (2006). What we have learned: RC28’s contributions to knowledge about social stratification. *Research in Social Stratification and Mobility*, 24, 1–20.
- Hughes, A. L. (1988). *Evolution and human kinship*. Oxford University Press.
- Jæger, M. M. (2012). The extended family and children’s educational success. *American Sociological Review*, 77, 903–922.
- Jankowiak, W., & Diderich, M. (2000). Sibling solidarity in a polygamous community in the USA: Unpacking inclusive fitness. *Evolution and Human Behavior*, 21, 125–139.
- Kolk, M. (2014). Multigenerational transmission of family size in contemporary Sweden. *Population Studies*, 68(1), 111–129.
- Kramer, K. L. (2010). Cooperative breeding and its significance to the demographic success of humans. *Annual Review of Anthropology*, 39, 417–436.
- Laham, S. M., Gonsalkorale, K., & von Hippel, W. (2005). Darwinian grandparenting: Preferential investment in more certain kin. *Personality and Social Psychology Bulletin*, 31, 63–72.
- Lahdenperä, M., Gillespie, D. O. S., Lummaa, V., & Russell, A. F. (2012). Severe intergenerational reproductive conflict and the evolution of menopause. *Ecology Letters*, 15, 1283–1290.
- Lehti, H., & Erola, J. (2017). How do aunts and uncles compensate for low parental education in children’s educational attainment? In J. Erola & E. Kilpi-Jakonen (Eds.), *Social inequality across the generations: The role of compensation and multiplication in resource accumulation* (pp. 89–111). Edward Elgar.
- Lyngstad, T. H., & Prskawetz, A. (2010). Do siblings’ fertility decisions influence each other? *Demography*, 47, 923–934.

Mathews, P., & Sear, R. (2013). Does the kin orientation of a British woman's social network influence her entry into motherhood? *Demographic Research*, 28, 313–340.

McBurney, D. H., Simon, J., Gaulin, S. J. C., & Geliebter, A. (2002). Matrilateral biases in the investment of aunts and uncles: Replication in a population presumed to have high paternity certainty. *Human Nature*, 13, 391–402.

Milardo, R. M. (2010). *The forgotten kin: Aunts and uncles*. Cambridge University Press.  
Nitsch, A., Faurie, C., & Lummaa, V. (2014). Alloparenting in humans: Fitness consequences of aunts and uncles on survival in historical Finland. *Behavioral Ecology*, 25(2), 424–433.

Nitsch, A., Faurie, C., & Lummaa, V. (2013). Are elder siblings helpers or competitors? Antagonistic fitness effects of sibling interactions in humans. *Proceedings of the Royal Society B: Biological Sciences*, 280. <http://doi.org/10.1098/rspb.2012.2313>.

Pashos, A. (2017). Asymmetric caregiving by grandparents, aunts, and uncles and the theories of kin selection and paternity certainty: How does evolution explain human behavior toward close relatives? *Cross-Cultural Research*, 51, 263–284.

Pashos, A., & McBurney, D. H. (2008). Kin relationships and the caregiving biases of grandparents, aunts, and uncles. *Human Nature*, 19(3), 311–330.

Pettay, J. E., Lahdenperä, M., Rotkirch, A., & Lummaa, V. (2016). Costly reproductive competition between co-resident females in humans. *Behavioral Ecology*, 28, <https://doi.org/10.1093/beheco/arw088>.

Pettay, J. E., Lahdenperä, M., Rotkirch, A., & Lummaa, V. (2017). Effects of female reproductive competition on birth rate and reproductive scheduling in a historical human population. *Behavioral Ecology*, 29, 333–341.

Platek, S. M., & Shackelford, T. K. (Eds.) (2006). *Female infidelity and paternal uncertainty: Evolutionary perspectives on male anti-cuckoldry tactics*. Cambridge University Press.  
Pollet, T. V. (2007). Genetic relatedness and sibling relationship characteristics in a modern society. *Evolution and Human Behavior*, 28, 176–185.

Pollet, T. V., & Hoben, A. D. (2011). An evolutionary perspective on siblings: Rivals and resources. In C. A. Salmon & T. K. Shackelford (Eds.), *The Oxford handbook on evolutionary family psychology* (pp. 128–148). Oxford University Press.

Pollet, T. V., Kuppens, T., & Dunbar, R. I. M. (2006). When nieces and nephews become important: Differences between childless women and mothers in relationships with nieces and nephews. *Journal of Cultural and Evolutionary Psychology*, 4, 83–93.

Rodgers, J. L., & Rowe, D. C. (1993). Social contagion and adolescent sexual behaviour: A developmental EMOSA model. *Psychological Review*, 100, 479–510.

Rotering, P. P., & Bras, H. (2015). With the help of kin? *Human Nature*, 26, 102–121.

- Rotkirch, A. (2018). Evolutionary family sociology. In R. L. Hopcroft (Ed.), *Oxford handbook of evolution, biology, and society* (pp. 451–478). Oxford University Press.
- Sear, R. (2008). Kin and child survival in rural Malawi: Are matrilineal kin always beneficial in a matrilineal society? *Human Nature*, 19, 277–293.
- Sear, R., & Coall, D. A. (2011). How much does family matter? Cooperative breeding and the demographic transition. *Population and Development Review*, 37, 81–112.
- Sear, R., & Mace, R. (2008). Who keeps children alive? A review of the effects of kin on child survival. *Evolution and Human Behavior*, 29, 1–18.
- Segal, N. L., & Marelich, W. D. (2011). Social closeness and gift giving by twin parents toward nieces and nephews: An update. *Personality and Individual Differences*, 50, 101–105.
- Segal, N. L., Seghers, J. P., Marelich, W. D., Mechanic, M., & Castillo, R. (2007). Social closeness of monozygotic and dizygotic twin parents toward their nieces and nephews. *European Journal of Personality*, 21, 487–506.
- Tanskanen, A. O. (2015). Childlessness and investment in nieces, nephews, aunts, and uncles in Finland. *Journal of Biosocial Science*, 47, 402–406.
- Tanskanen, A. O., & Danielsbacka, M. (2014). Genetic relatedness predicts contact frequencies with siblings, nieces and nephews: Results from the generational transmissions in Finland surveys. *Personality and Individual Differences*, 55, 5–11.
- Tanskanen, A. O., & Danielsbacka, M. (2017a). Contact frequencies with nieces and nephews in Finland: Evidence for the preferential investment in more certain kin theory. *Journal of Social and Personal Relationships*, 34, 26–43.
- Tanskanen, A. O., & Danielsbacka, M. (2017b). Parenthood status and relationship quality between siblings. *Journal of Family Studies*, 1–12.
- Tanskanen, A. O., & Danielsbacka, M. (2019). *Intergenerational family relations: An evolutionary social science approach*. Routledge.
- Tanskanen, A. O., Jokela, M., Danielsbacka, M., & Rotkirch, A. (2014). Grandparental effects on fertility vary by lineage in the United Kingdom. *Human Nature*, 25, 269–284.
- Waynforth, D. (2011). Grandparental investment and reproductive decisions in the longitudinal 1970 British cohort study. *Proceedings of the Royal Society B: Biological Sciences*, 279, 1155–1160.
- Wells, J. C. K., & Stock, J. T. (2007). The biology of the colonizing ape. *American Journal of Physical Anthropology*, 134, 191–222.

Wenger, G. C., Scott, A., & Patterson, N. (2000). How important is parenthood? Childlessness and support in old age in England. *Ageing and Society*, 20, 161–182.