Chapter 2

A new niche? The theory of grandfather involvement

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Abstract

A multitude of factors influence the role a grandfather plays in his family. This chapter will present an interdisciplinary perspective of grandfathering incorporating research from the fields of evolutionary biology, sociology, economics and psychology. Examples will be used to show how these perspectives complement rather than compete with each other. A range of influences on grandfathering operating at the individual, familial and broader economic and cultural levels will be examined. Evidence points to grandfathering filling a new niche in modern societies: changing demographics mean there is greater need and opportunity for actively engaged grandfathers to help their families, especially in times of need. Recent empirical findings will be used to illustrate these points providing a basis for the more detailed information presented throughout the following chapters.

Key words: grandfathers; interdisciplinary perspectives, grandfathering, grandparental investment, grandchild development

Introduction

Grandparents in contemporary industrialised societies invest substantial amounts of time, money and care in their grandchildren. For example, in the United States in 2007, 2.5 million grandparents were responsible for most of the basic needs of one or more of the grandchildren who lived in their

household (U.S. Census Bureau 2009). Across 11 European countries, 44 per cent of grandparents report to have provided childcare for their grandchildren in the last 12 months without the parents present (Glaser et al. 2013). This involvement is considerable. With rapidly changing family structures and a concomitant change in the potential role of both grandmothers and grandfathers, research is now slowly moving from a strong focus on grandmothers to also understand the specific roles grandfathers play. It is naïve to lump all grandparents together in investigations, as is often done, or to focus only on maternal grandmothers or select the 'favourite' or most involved grandparent. This 'favouritism' in past research has resulted in the role of grandfathers being marginalized (Mann 2007), even the exclusion of grandfathers from research (Reitzes & Mutran 2004), and 'grandparent' becoming synonymous with 'grandmother' (Harper 2005). We aim to make first steps in addressing this blind spot in theory and research. We do so by bringing together research from evolutionary biology, sociology, economics and psychology to suggest an interdisciplinary perspective on grandfathering.

Across industrialised nations, grandfathers make notable contributions to grandchild care that come near to those made by grandmothers. In a sample of more than 35,000 people across ten European countries, 58 per cent of grandmothers and 49 per cent of grandfathers provided some care for their grandchild during a 12 month period (Hank & Buber 2009). A sample of Germans aged 55 to 69 years was observed to spend, on average, 12.8 hours each month supervising their grandchildren (Kohli et al. 2000). Like the investments of grandmothers, this notable investment of grandfathers has the potential to influence family function and grandchild health and well-being. At the same time, systematic differences between grandfathers and grandmothers are likely to influence grandfathers' involvement, the role they play and the consequences their behaviour exacts. Such differences concern timing of marriage, family formation, health and life expectancy, financial and social resources, life experiences and socialisation (Szinovacz 1998a; Tran et al. 2009). Next, we examine grandfathers' care using the main theoretical perspectives. Then we use the empirical example of sex and lineage to show how the diverse theoretical perspectives, often seen as conflicting, can

complement each other. Finally, we explore the new niche that grandfathers may occupy in families as a result of demographic and family structure changes.

Why do grandfathers care?

Many grandfathers, in the immediate pre-grandparenthood stage, openly say to their family and friends that they do not understand what all of the fuss around becoming a grandparent is. Then, quite suddenly, with the arrival of their grandchild, there is a recognisable shift in grandfathers' views often with an immediate connection and an element of surprise (St George & Fletcher 2014). As we will discuss below, why this change takes place and why grandfathers invest in their grandchildren can be explored from many perspectives.

There are myriad dimensions that influence the role and impact grandparents have within families. These dimensions have been explored and documented by disciplines as diverse as sociology, economics, psychology, and evolutionary biology (Coall & Hertwig 2010). Each of these disciplines has made substantial contributions crucial to understanding the role of grandparents. To date, each discipline, however, has worked largely in isolation with little reference to, and benefit from, each other (Coall & Hertwig 2011). To achieve the greatest impact in this research area, it is time to join forces, by simultaneously exploring grandparental investment on multiple levels. Next, we briefly turn to some of the basic theoretical approaches (for detailed reviews, see Coall & Hertwig 2010).

The Evolutionary Perspective

The broadest level of explanation highlights humans within an evolutionary context as cooperative breeders. According to the cooperative breeding hypothesis, a mother does not raise her children by herself but is helped by other members of her social group (Hrdy 2009). Although in both traditional societies (generally low income, higher fertility, higher mortality with limited access to medical services) and contemporary industrialised societies (generally high income, low fertility, low

mortality, access to medical services, and many would be considered post-industrial) these helpers are not necessarily kin (Coall et al. 2014; Ivey 2000), one class of kin helper, often available and inclined to help, is that of the post-reproductive adults — grandparents.

Within this predominantly anthropological literature, the focus has been on grandmothers. Williams (1957) initially proposed that menopause in humans was unique amongst animal species, and therefore, may benefit from an evolutionary understanding. He suggested menopause has evolved because, at a certain age, the benefit of continued care to existing children (and grandchildren) outweighs the cost of further reproduction (mainly risks associated with childbirth). This thesis triggered numerous investigations into the influences of kin in general — and grandmothers in particular — on the survival of offspring in contemporary traditional and historical human populations.

One of the resultant lines of research has culminated in the *grandmother hypothesis*. The grandmother hypothesis proposes that grandmothers might have been the most knowledgeable, efficient, and motivated helpers for reproducing mothers throughout human history (Hawkes, O'Connell, Blurton Jones, Alvarez & Charnov 1998). They are considered by some to be the mothers' ace in the hole (Hrdy 2009), helping them to leave more children and grandchildren than mothers whose own mothers are no longer available to help.

The grandmother hypothesis is currently the most influential theory to explain why human female longevity extends beyond menopause and the extended human lifespan more generally. In their now classic study of the influence family members have on child survival, Sear & Mace (2008) reviewed 45 studies investigating effects of the presence versus absence of various kin. Their findings generally support the beneficial influence of post-reproductive relatives, especially the maternal grandmother, in natural-fertility societies (these are generally high-fertility, high-mortality, societies in which contraceptives are not used). Of the 13 studies examining the influence of maternal grandmothers, nine (69 per cent) found that the presence of a maternal grandmother was associated with an increase in her grandchildren's probability of surviving the high-risk times of infancy and childhood. Studies have been more inconsistent in their findings about the benefits of

paternal grandmothers: Depending on the investigation, having a paternal grandmother present had a positive (53 per cent), negative (12 per cent) or no (35 per cent) influence on child survival. Thus, although there is evidence in support of the grandmother hypothesis, it is not uniformly positive.

Is there evidence that a similar advantage of grandfathering might have influenced the evolution of the human life cycle? Sear & Mace (2008) found evidence that the presence of grandfathers painted a different picture compared to grandmothers. In 83 per cent (10 of 12 studies) of cases, the presence of maternal grandfathers was not associated with child survival, but in the remaining 2 studies it had a positive association. In the case of paternal grandfathers, 50 per cent of studies had no effect (6 of 12 studies), 25 per cent had a positive effect and the remaining 25 per cent showed that the presence of the paternal grandfather was associated with reduced child survival.

To date, there does not seem to be strong evidence that caring by grandfathers provides an adaptive explanation for why grandparents exist, in the same way that caring by grandmothers may explain the evolution of post-reproductive women (often grandmothers). In a historical Finnish population (1714-1839), with a positive influence of grandmothers' presence on child survival (Lahdenperä et al. 2004), no association was found between grandfathers' presence and increased grandchild survival. Furthermore, no evidence was found that grandfathers who lived longer ultimately had more grandchildren (see Lahdenperä et al. 2007 & 2011). Males could remarry after being widowed (divorce was not permitted in this historical population), and thus could reproduce for a longer period of time. Yet, among men who remarried, the channelling of resources to their new family had such a large impact on the survival of children from the man's original family that the number of grandchildren they had actually fell after 50 years of age (Lahdenperä et al. 2011). Reductions in paternal investment are also seen in serially remarried families in industrialised nations (Tanskanen, Danielsbacka & Rotkirch 2014). These first findings provide little reason to assume that grandfathering would have been favoured by natural selection. This research, however, is still in its

infancy, and they do not yet preclude benefits of grandfathering at the family and individual level. We will see this shortly.

The Economic Perspective

Intergenerational transfers can take many forms. They can be via inheritance, they can consist of financial or time transfers, and transfers can be upward or downward. Possibly because of this variety, there is no overarching economic model of parental, let alone grandparental, investment. Nevertheless, most models rest on the utility maximization and rational choice framework, and many models of intergenerational transfers between family members have proposed the existence of two competing motives: altruism and self-interested exchange.

Children are expensive (Kaplan 1994), so why do parents shift so many of their resources to their children? According to Becker (1974) and Barro (1974), a parent's welfare is partly a function of the welfare of their children and grandchildren. Specifically, the parent's utility function incorporates the child's likely lifetime utility. This would explain why parents shift resources to their children as a function of those children's quality (e.g., skills and abilities) and later use wealth transfers to equalize outcomes across children (redistributive neutrality). Successive generations are thus linked by recursive altruistic preferences. That is, parents care altruistically for their children, who then transfer resources to their children, and so on.

In the self-interested exchange view, parents' transfers are part of a strategic bargaining between parents and children (see Laferrère & Wolff 2006). Intergenerational transfers can be understood as an investment through which parents try to secure their children's commitment in the future. Anticipating that when they become frail they will need help, parents invest now (e.g., education expenses, gifts, loans) and in the future (promise of inheritance) to increase the likelihood that their children will help them in their time of need.

There are a number of empirical challenges to both the altruistic and the self-interested exchange views (see Arrondel & Masson 2006). One problem for the altruistic view, for example, is that parents transfer most of their wealth through bequests, rather than earlier in the form of gifts, when children need them most. The self-interested exchange view faces the problem that although grandparents undoubtedly do invest substantial amounts of resources in their grandchildren, there is little evidence that grandchildren consistently reciprocate. The few grandparents who do receive support from their grandchildren may derive a relatively larger benefit, but such cases represent a small minority (Hoff 2007).

The Sociological Perspective

The extended family first received scant attention within the sociological modernisation paradigm and its emphasis on the nuclear family. In the last decades, demographic dynamics and the increasing fragility of state-funded pension schemes pushed the issues of intergenerational exchanges and intergenerational solidarity to centre stage. In studying these issues, sociologists have been predominately focused on structural factors (e.g., female participation in the labour force), social institutions (e.g., how wealth is taxed at death), and cultural values (e.g., family obligations and roles). Their investigations have produced a wealth of information on factors that clearly have consequences for patterns of grandparental investment but are consistently neglected by other fields (e.g., individual values and cultural norms). The potential value of this research building a coherent picture of grandparenting has been limited because, currently, these diverse studies are not situated within an overarching theoretical framework, the lack of which is recognized by sociologists to limit progress (Szinovacz 1998b).

One attempt toward creating an encompassing framework is the rational-grandparent model (Friedman, Hechter & Kreager 2008). Echoing the self-interested-exchange view in economics, this model assumes that the driving force behind investments is grandparents' concern about how they will be provided for in old age. To reduce this uncertainty, grandparents preferentially invest in those

grandchildren whose parents are most likely to reciprocate in the future. Although some explicit predictions of the model (e.g., that grandparents are indifferent to biological relatedness) conflict with evolutionary perspectives, the benefit of this model is that it provides a framework of testable predictions about how grandparental investment varies.

Explaining the same robust grandparental Investment pattern from different perspectives

As emphasised before, treating all grandparents, or even all grandfathers, as a homogeneous group is remiss. It neglects the enormous variability among grandparents and the variable circumstances under which they contribute to their families. Across disciplines and measures of grandparental care, support and closeness, perhaps, the most robust pattern found in industrialised nations is this: Maternal grandmothers invest the most in their grandchildren, followed by maternal grandfathers, then paternal grandmothers, with paternal grandfathers investing the least (see Dubas 2001; Eisenberg 1988; Euler & Weitzel 1996; Hoffman 1980; Laham et al. 2005; Monserud 2008; Pollet et al. 2009; Uhlenberg & Hammill 1998). Across disciplines, however, different explanations for this pattern exist. Sociological theorizing holds that women are kin-keepers, tasked with holding kin groups together (Dubas 2001; Eisenberg 1988; Hagestad 1986). Similarly, according to the sociological family systems theory, it is the gatekeeper role of the parent (middle) generation that encourages (or not) the grandparent–grandchild relationship (Chan & Elder 2000; Rossi & Rossi 1990). Consequently, when grandparent and parent are female (e.g., maternal grandmother), the bond between grandparent and grandchild will be stronger relative to both parties being male (e.g., paternal grandfather). This combination of social factors can produce the grandparental investment pattern described above.

Evolutionary perspectives attribute this association between grandparent type and involvement (discriminative grandparental solicitude [Euler & Weitzel 1996]) to sex-specific reproductive

strategies and paternity uncertainty (see Table 1 in Coall & Hertwig 2010). The term 'investment' is here used to denote all resources, care and time that a grandparent provides to a grandchild. Purely because grandfathers are related to their grandchildren, evolutionary theory does not predict grandfathers will invariably help their grandchildren. Rather, according to Hamilton's rule (Hamilton 1964), helping is moderated by opportunity costs that may differ across types of grandparents (e.g., grandmother vs. grandfather) making some investment alternatives more valuable than others.

Theoretically, paternity uncertainty is also predicted to play a role. Whereas women are 100 per cent certain who their children are, males cannot be 100 per cent certain that they are the biological father of their children. Note that the use of the word 'certain' in this context does not necessarily imply conscious thoughts and reflections. Grandparents with higher levels of certainty of their biological relationship to their grandchildren are assumed to invest more than those with lower levels of certainty. This assumption can explain why maternal grandmothers, certain of their relationships with their daughters and their daughters' relationship with their grandchildren, invest more than paternal grandfathers. Paternal grandfathers have two points of uncertainty between themselves and their grandchildren, they cannot be 100 per cent certain of their relationship with their sons nor of their sons' relationship with their grandchildren (see Euler & Weitzel 1996; Smith 1987). The fact that these patterns of grandparental investment may be confined to industrialised societies and are not always present in rural (Pashos 2000; Kaptijn et al. 2013) and more traditional populations (Snopkowski & Sear 2015) means there is some question over the actual impact of paternity uncertainty (see Sear, in press) — also in light of the fact that cross-cultural estimates suggest only around 2 per cent of children are being fathered by someone other than their putative father (Anderson 2006).

The notion of paternity uncertainty suggests that maternal grandfathers and paternal grandmothers both would invest an intermediate amount, because they both have one point at which their relationship certainty with their grandchildren could be severed. In reality, however, maternal

grandfathers invest significantly more than paternal grandmothers, for instance, in terms of frequency of face-to-face interactions and emotional closeness (Hoffman 1980). Several authors have addressed this limitation of paternity certainty by incorporating sex-specific reproductive strategies into their models of grandparental investment (Euler & Weitzel 1996; Huber & Breedlove 2007). Specifically, individuals are assumed to be more inclined to invest in female relatives than male relatives because investment put into female kin is more likely to be transformed into parental care, whereas resources invested into male kin may be used also for mating effort. Based on this logic, the higher investments of maternal grandfathers can be explained thus: They invest in their daughter's children relative to paternal grandmothers who invest in their son's children (Euler & Weitzel 1996). Thus, the combination of paternity uncertainty and sex-specific reproductive strategies predicts the often-found pattern of grandparental investment.

Finally, from a psychological perspective, it has been proposed that the robust grandparental investment pattern may result from the well-known differences in age and life expectancy between grandparent types (Tran et al. 2009). In a couple the male is often older, marrying later and having children later. In turn, their male offspring may also marry later. Thus, investment patterns may not be due to evolutionary or sociological explanations, but purely the result of grandfathers being older and potentially less healthy. The strength of an interdisciplinary perspective is illustrated here as these different fields of research have made, largely independently (see Coall & Herwig 2011), similar and broadly compatible predictions (Dubas 2001; Huber & Breedlove 2007) even though they focus on different levels of explanation (i.e., mechanistic versus adaptationist).

Complementary not competing approaches

Perhaps the key variable considered in the evolutionary grandparental investment literature is biological relatedness. Evidence is emerging that the genetic relationship between grandparents and

grandchildren is an independent predictor of high grandparental investment, even in contemporary European societies (Coall, Hilbrand & Hertwig 2014). The impact of biological relatedness is often seen as incompatible with sociological and economic models of parental and grandparental investment. These models often assume investment to flow to those grandchildren (and their parents) who are more likely to reciprocate in times of need. If, however, non-biologically related individuals are less likely to reciprocate, which an evolutionary perspective would suggest, findings concerning the importance of biological relatedness will simultaneously support the predictions of the sociological, economic, and evolutionary accounts.

Reciprocal altruism, often conceptualized as exchanges between unrelated individuals, is likely to have originally evolved in genetically related kin groups. The psychological traits that maintain a system of reciprocity in humans (e.g., guilt, trust, sympathy, gratitude [Trivers 1971]) are likely to be stronger between close kin, which in-turn promotes close kin as less risky partners with whom to reciprocate (Allen-Arave, Gurven & Hill 2008). A strong attachment between parent and child has been proposed as a proximate mechanism for parents to identify and favour caring for their biological children (Daly & Wilson 1980). A similarly strong attachment relationship may also be found when parents adopt a young child (Hrdy 1999). Similarly, quality grandparent-grandchild attachment relationships may provide a crucial proximate mechanism whereby grandparents identify and preferentially care for grandchildren of their own children (Euler & Weitzel 1996; Kennedy 1990). Indeed, the many non-biological grandparents who *do* invest in step-grandchildren may do so because of particularly harmonious relationships between family members. Conversley, in some cases biological grandparents may not invest due to poor intergenerational relationships (Coall, Hilbrand & Hertwig 2014). Therefore, on balance, it is likely that investment in biological grandchildren improves inclusive fitness and is simultaneously more likely to be reciprocated. Consequently, our finding that high levels of investment are more likely to come from biological grandparents is not necessarily at odds with economic or sociological accounts of grandparental investment (see also Tanskanen, Danielsbacka & Rotkirch 2014).

Family size, birth order and availability of other kin influence grandfathering

There are various factors that are likely to influence investment by grandfathers and grandmothers and, yet, they are not currently included in most analyses. The preponderance of the nuclear family in industrialised nations means concomitant changes in family size, birth order and availability of other kin. In traditional societies, larger families can recruit older siblings to provide resources for a family (Ivey 2000; Kramer 2002). In industrialised societies, in contrast, the impact of sibling help for child care is likely to be low because siblings are so closely spaced (Sear & Coall 2011). However, in both cases, a larger family size, ceteris paribus, dilutes the resources available for each child (Blake 1987; Hertwig et al. 2002; Marks 2006) and grandchild (Coall et al. 2009; Leonetti et al. 2005; Uhlenberg & Hammill 1998).

Larger family sizes offer more investment options and invite preferential investment. In a study of 787 Australian university students, Laham et al. (2005) observed that the emotional bond grandchildren reported to their maternal grandfather or paternal grandmother depended on the availability of other kin. Moreover, the general finding that maternal grandfathers provide more investment to grandchildren than do paternal grandmothers only held when the paternal grandmothers had other children in whom to invest. This means that if a grandmother has both a son and a daughter, she tends to focus on her role as a maternal rather than a paternal grandmother. These findings extend to grandfathers as well. Using the Survey of Heath Ageing and Retirement across Europe data, Danielsbacka, Tanskanen, Jokela & Rotkirch (2011) found that when grandfathers had grandchildren via both a son and a daughter, they provided more child care to their daughter's children (maternal grandfather) rather than their son's children (paternal grandfather).

Do modern grandfathers fill a novel niche?

There is no doubt that the role of grandfathers is work in progress. It will continue to evolve through time as social factors that influence it change (see also Chapter 3). To extend this timeframe further, here, we briefly consider traditional and contemporary industrialised societies. As was detailed above, evidence from traditional societies show the fathers and grandfathers appear to have a smaller impact on child survival than mothers and grandmothers (Sear & Mace 2008). This may be explained by the fact that women universally invest more in both parenting and grandparenting effort than men, at least in terms of direct childcare (see Kokko & Jennions 2008 for evolutionary explanations of why mothers tend to care more than fathers). Human males, more so than most other mammals, frequently invest heavily in parental effort. This investment can nevertheless vary quite substantially between men both within and between societies, as some men derive greater fitness benefits from investing more in mating rather than parenting effort. Similarly, the role of grandfathers may be more variable than that of grandmothers. There are some environments in which older men may still benefit from continued investment in mating, acquiring a new spouse for example, but other environments exist where it may pay older men to invest in parenting or grandparenting effort.

A look at the empirical evidence confirms that the role of grandfathers is highly variable and contingent on the environment. For example, in those hunter-gatherer and horticulturist societies where the male contribution to subsistence is substantial, men can continue to provision their families into older age, so that grandfathers may provide valuable nutritional resources (Hooper, Gurven, Winking & Kaplan 2015; Kaplan 1994). In other societies, however, such as those agricultural societies where polygyny or serial monogamy is common, a high-ranking man may reserve the most valuable resources for himself and redistribute them elsewhere for other advantage such as increased mating opportunities. This heightens competition for resources within the family, and may

explain those findings where a negative impact on grandchild survival has been found (Campbell & Lee 1996; Kemkes-Grottenthaler 2005).

Overall, the large literature concerning the involvement of fathers and their impact on child wellbeing suggests that fathers may be more consistently available, if not more important, in contemporary industrial than traditional societies (see Amato and Rivera 1999; Lamb 2010; Sigle-Rushton and McLanahan 2004). One may thus hypothesize that grandfathers also fill new niches in families that may have appeared as investment in children has increased and family structures have changed. The role of the 'competent provider' mentioned above in traditional societies may have diminished substantially in societies with small families and few children. However, it is being replaced with a more engaged grandpaternal role (Roberto, Allen & Blieszner 2001). It is clear the roles of fathers and more pertinently, grandfathers have changed dramatically in contemporary developed societies (Sear & Coall 2011).

Among other roles grandmothers play, they are seen to fill a void that opens up when fathers are absent due to death, divorce or hunting (Konner 2010; Marlowe 2005; Scelza 2009). Consistent with this substitution role, it has been found that single-parent families in traditional populations actually have more helpers than dual parent families (Sugiyama & Chacon 2005). The normative nuclear family system in contemporary industrialised societies means that men (both fathers and grandfathers) may benefit the family by investing more in parenting and grandparenting.

The ever increasing investment in children in contemporary industrialised societies means nuclear families require heavy investment from vertical kin in the absence of support from broad, horizontal kin networks). This also restricts men's mating opportunities given that polygyny is not permissible and serial monogamy comes with high costs of investing in multiple families. Further, with the advent of social security systems, after retirement, grandfather availability has potentially increased, especially for the investment of time, such as childcare. Therefore, as fathering has, grandfathering

may now become a more important resource for the family, providing grandfathers with the opportunity to carve out their own new niche.

Consistent with this high-investment niche, research literature shows that grandfathers are becoming actively involved, engaged and make a difference to their grandchildren. Crucially, this is movement away from the traditional view of grandfathers as passive, remote and disengaged (Roberto et al. 2001). Tinsley and Parke (1987) investigated measures of physical and mental development as a function of the frequency of grandparent–grandchild contact with seven-month-old infants and their families. Each grandparent was observed playing with the infant, in the infant's house, for five minutes and the interaction was assessed throughout. Grandfathers who were rated as highly responsive and highly playful had infants with higher Bayley Scales of Infant Development raw and adjusted Physical Health Index scores (Tinsley & Parke 1987). Although engaging play may be a universally positive influence, other outcomes such as education may be more nuanced. Scholl Perry (1996) investigated the influence of grandparental investment on academic achievement and found the social distance to grandfathers, but not grandmothers, was associated with grade point average. Specifically, a larger social distance between the student and their paternal grandfather was associated with a higher grade point average. Conversely, a *smaller* social distance to maternal grandfathers was associated with higher grade point averages. The scarcity of this evidence highlights the need for further investigation into the emerging role grandfathers are playing (see also chapter 4 TANSKANEN DANIELSBACKA?).

There is also reason to speculate that the availability of the grandfather niche may not be equally distributed across demographic groups. Lower socio-economic groups experience higher rates of single motherhood, less father involvement (Nettle 2008), more reliance on kin other than the father (Thomese & Liefbroer 2013), and receive less paid child care. Therefore, through choice or necessity, this new grandfather niche may be more common in lower socio-economic areas.

Grandfather niche: Single teenage mother families

We have suggested that grandfathers have found a new niche, which may be especially prominent in low-resource family environments such as single-parent families and families experiencing poverty. For example, in studies that explicitly focus on single-parent families, a resident grandfather can have a significant influence on grandchild development. In a study of 66 multi-generational, teen-mother families in Detroit (US) — with the biological father absent, and grandchildren between one and two years of age — higher levels of grandfather nurturance were associated with the child being more likely to comply with its mother's requests. Moreover, higher levels of grandfather involvement substantially reduced negative affect in the grandchildren. This effect was robust and remained after adjustment for socio-economic status, grandmother's occupation, hours of grandmother employment, grandfather's age, and hours of grandfather employment (Oyserman, Radin & Benn 1993; Radin, Oyserman & Benn 1991). Interestingly, there was no evidence of grandmother effects in this sample. It may be the case that in these father-absent, single-mother, multigenerational households, the grandfather assumes the father figure role thus overshadowing the grandmother role. It also demonstrates that grandfathers are rising to the challenges associated with difficult low-resourcefamily environments (Roberto et al. 2001). Potentially, this role may represent an emerging niche for grandfathers that traditionally might have been the domain of the maternal grandmother.

The evidence that the influence a grandparent has during times of need is larger has been established. However, the question of whether grandparents intentionally direct their resources where the need is greatest has received less attention. Need is an important new variable that is emerging in the grandparental investment literature (Roberto et al. 2001; Snopkowski & Sear 2015; Thomese & Liefbroer 2013). It is also a variable that is not entirely dealt with by the predominant, utility based models detailed above and is likely to benefit from consideration of evolutionary perspectives (Hooper, Gurven, Winking & Kaplan 2015). Need and responding to need is likely to be

important in single-parent family and step-families that are often resource poor especially in terms of social capital (see Sear & Coall 2011).

Step-grandfather niche: Increasing prevalence

With increased rates of divorce and remarriage in industrialised societies, the changing roles of grandparents may be most salient for grandfathers. Falling rates of marriage and high rates of divorce and remarriage cause the proportion of non-kin, including grandparents, in any family to increase. In 2009, for instance, the U.S. marriage rate was 6.8 per 1,000 people with a divorce rate of 3.4 per 1,000 people (Tejada-Vera & Sutton 2010). After separation, 25 per cent of women, who are more likely to have custody of their children, will re-partner within two years and re-marry within five years (McNamee & Raley 2011). Therefore, males are increasingly likely to marry into existing families, forming new families and becoming step-fathers and step-grandfathers.

Quality relationships between grandchildren and their biological grandparents across nuclear, step-parent, and single-parent families have been associated with improved emotional health of grandchildren (Ruiz & Silverstein 2007). Moreover, maintaining quality contact with paternal grandparents who are often alienated during re-marriage and step-family formation is beneficial to the behavioural adjustment and mental health of both grandparents and grandchildren (Attar-Schwartz et al. 2009; Bray & Berger 1990; Drew & Silverstein 2007). The role that non-biological grandparents (e.g., a step-father or the step-father's parents) play in childcare and grandchildren's development has, in contrast, received little attention. This, in turn, has resulted in calls to introduce genetic relatedness into interdisciplinary studies of grandparental investment (Danielsbacka, Tanskanen & Rotkirch 2015; Kaptijn et al. 2013). Using the Survey of Heath Ageing and Retirement across Europe, Coall and colleagues (2014) found that while biological grandparents were more likely to provide frequent informal childcare for their grandchildren, non-biological grandparents, who are

typically step-grandparents, still invested in their grandchildren and were more likely to invest on a monthly basis or less frequently. Crucially for this chapter, non-biological grandparents were significantly more likely to be grandfathers. This study provides initial evidence that the role of step-grandparent is more likely to fall to grandfathers. At increasing rates in the future, grandfathers will experience this new and challenging role in step and blended families.

Summary of grandfather effects in industrialised societies

Like the role of fathers, in contrast to traditional societies, grandfathers in contemporary industrialised societies can have an equal if not larger impact on grandchild development than grandmothers. The effects grandparents have on grandchild development are generally of a small size, however, some of the biggest effects are found for grandfathers (see Radin et al. 1991). The fact that these associations are found across grandchild ages, study designs and diverse populations, and generally take into account a range of potential confounding variables adds strength to these findings. Although the direction of the causal association cannot be established from these studies, the ability in longitudinal studies to adjust for variables including earlier markers of grandchild development (e.g., Pittman 2007) suggests grandparents may have an actual causal impact. Moreover, like the compelling ethnographic data from traditional societies, these findings are supported by qualitative analyses that show *it is not the grandparent-grandchild relationship per se that makes a difference, rather it is what grandparents actually do with their grandchildren that is crucial* (see El Hassan Al Awad & Sonugabarke 1992; Botcheva & Feldman 2004; Griggs et al. 2010; Coall & Hertwig 2011). In contemporary industrialised societies the child outcomes of interest have changed, and studies are now exploring social well-being and cognitive development rather than child survival. However, the evidence that grandparents, including grandfathers, have a positive influence on grandchild development is growing. As is the evidence that grandfathers may be

actively assuming new niches within families, especially in the trying times of divorce, re-marriage and economic hardship.

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