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Veronika Bóné*

GRANDPARENTING

Created by Evolution Revised by History: Still in Use Today

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The ageing of Western societies and its consequences have been long focused on by extended research. Taking care of the elderly is a heavy burden for the healthcare system, the social care system and for the families, and according to statistics and projections, more and more elderly people must be supported by less and less active employees. Our study approaches the issue of ageing from another perspective: what kind of advantages are provided by the presence of the elderly for the society, what kind of positive effects do they exert through their grandparent role on the families and the society they live in. A simultaneous trend, along with ageing, is the increasing postponement in childbearing and the decreasing fertility. By analysing the former studies and works we investigate whether more and more people are experiencing grandparenthood because of their lengthening lifespan enabling them to provide help and support for the family rearing children, or grandparenthood sets in in the life of the elderly in an age when they are physically and mentally limited. In the history of humanity the development of grandparenting was an important step in the spreading of the species by increasing the chances of survival. And though the natural environment has changed significantly, we are convinced that grandparenting can provide an answer for the challenges of the present era.

Keywords: ageing, post-reproductive life span, grandparenting, role of grandparents, fertility, evolution

1. Basic demographic trends in developed countries

1.1. Ageing

The two central topics of recent demographic studies has been the ageing characteristic to the Western societies and the issue of low fertility (Kalwij 2010; Füzesi et al. 2013; Leopold & Skopek 2015b; Neményi 2003). The proportion of people above 65 years of age in Europe was 15% in 2015, and this rate is going to increase to 25%

* Veronika Bóné, Institute of Mental Health, Semmelweis University, Nagyvárad tér 4., H-1089 Budapest, Hungary; bone.veronika@public.semmelweis-univ.hu.

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by 2050 according to generally accepted projections (EUROSTAT). The life expectancy both at birth and at 65 years of age is increasing, so the population becomes older and older and more and more people will live a long elderly life (EUROSTAT). However, lifespan and age distributions in themselves are not good enough indicators of the general state (associated with ageing) of a society. As Füzesi and colleagues (2013) showed, these days' 70-year-old people are as healthy as the 60-year-old population was 50 years ago. Therefore a very important auxiliary indicator is the healthy life expectancy i.e. the number of those years that a person can live without significant limitations. Although it is not increasing to the same extent as life expectancy (Jagger et al. 2013), its significance cannot be debated.

1.2. Low fertility

Europe has had a low fertility rate for decades; the total fertility rate of 2.3 in the 1970s fell below the rate sufficient for simple reproduction, to 1.6 (2014). The reason for this is not simply the decreasing number of children per family, but also the increasing population without children (Hilbrand et al. 2017). Low fertility is basically explained by the following factors: 1) Educational expansion, i.e. we spend more and more time to obtain the knowledge necessary for our jobs, and we have to give longer and longer support for our children until they step out to the workforce market, therefore the cost of childcare increases. 2) Rise of female labour force participation, which is in part an inner desire of women, and partly originates from gender equality efforts and partly from ageing, i.e. the necessity of supporting the inactive population of increasing size. 3) Postponement of childbearing. The consequence of this is that not all planned children will be born as a result of lower fertility and deteriorating health status, potential relationship instability and changes in life conditions (Leopold & Skopek 2015b; Goksel et al. 2014; Neményi 2003; Ruzicska 2014).

1.3. Longer years of shared life

Considering the trends of ageing and postponement of childbearing, it can be stated that they are antagonistic towards experienced grandparenting. When the chance of longer life is greater, the chance for experienced grandparenting also increases (Szinovacz 1998; Leopold & Skopek 2015b). However, postponed and decreased childbearing means that becoming a grandparent occcurs at an older and older age (Leopold & Skopek 2015b). Based on empirical results, ageing has a greater significance, i.e. the 'longer years of shared life' phenomenon (Leopold & Skopek 2015b) has appeared, so the chance of becoming a grandparent and also a great-grandparent has increased due to age (Szinovacz 1998). The decreasing number of children per family and the increasing proportion of childless families also mean that more and more people attain the age of grandparenthood – without grandchildren (Mahne & Motel-Klingebiel 2012).

1.4. Perception of ageing

The elderly population with continuously increasing proportion comes not only with demographic and sociological consequences, but also changes the way elderly people perceive themselves. The cult of youth is very characteristic to our society, the value of old people has decreased. We are afraid of ageing because it calls such associations in ourselves like conservative, passive and limited. Therefore ageing (and the tasks that come with it, like grandparenting) is hard to accept for most of the people. Who do we consider 'old'? What is the basis of our categorisation? The question can be approached from the tools of biology (decreasing physical, mental and social performance), psychology (feel-age, look-age, do-age, and interest-age), sociology (termination of employment, moving away of children, grandparent role). The demand is rising for the positive approach of ageing by perceiving old age as a new opportunity and not as a limitation or loss. The concepts of Greying Revolution, Active Elder Singles, and Age of Enlightenment refer to this approach (Füzesi et al. 2013).

2. The purpose of human longevity

2.1. The phenomenon of post-reproductive life span in the animal world

Reproductive physiology is the result of evolutionary selection. This provides an optimal allocation of energy resources between life tasks (Bribiescas 2006) while strives for the highest possible inclusive fitness – i.e. genetic representation in the further generations (Gibson & Mace 2005). According to this approach the post-reproductive life span is a fundamentally wrong direction of evolution, since it shortens fertility (Chan et al. 2016). Therefore this phenomenon can be scarcely observed in the animal world, though it is characteristic to some insects and can be seen at some mammals, for example at killer whales and short-finned pilot whales. Among gall-forming social aphids the knowledge and protection of elderly females are important against predators, and the experience of females is required to obtain food among the whales too. The presence of an infertile female does not contribute to the survival of the offspring in the cases mentioned above, but gains benefits for the community (Croft et al. 2015; Brent et al. 2015; Ward et al. 2009).

According to studies of recent years, it is unprecedented that this phenomenon appears among other species of animals, post-reproductive life span has been observed among animals held in captivity, reared in zoos or among domesticated conditions (Croft et al. 2015; Ward et al. 2009; Kim et al. 2014; Kachel & Premo 2012; Csermely 2005), but the length of these periods had been quite short, and affected only a very small proportion of the population. Among humans this phenomenon appeared quite early. Based on archaeological and ethnographic data it can be said that though average lifespan had been below 40 years in these populations (due, among others, to high infant mortality), those women who attained adulthood, expectedly also attained their 60s as well. Even among human groups living among

the worst natural conditions, postmenopausal survival was higher than that among the primates living in the most protected environment (Croft et al. 2015). The average infertile duration of human females is estimated around 30 years while killer whales help their groups even as long as 40 years (Brent et al. 2015) by functioning as some kind of repositories (Croft et al. 2015; Ward et al. 2009). A question comes into the mind that if information and experience constitute such a great value, why has this phenomenon not been developed among other species? To utilise this knowledge, it is imperative that the offspring should not disperse, they should live together in groups. Among humans and whales it happens this way, while adolescent male primates reaching adulthood leave their birth group (Brent et al. 2015).

2.2. Adaptive or epiphenomenon, i.e. stopping early or living long after?

One of the most frequently put questions in the study of female menopause is that whether it can be considered adaptive or is it some by-product of development and longevity? The phenomenon itself is universal for the human species, it commences by all means, its timing is approximately similar, and since it is disadvantageous at first sight, it must have been selected out (Kachel & Premo 2012). However, the cessation of cycling is shared by primates (Alvarez 2000), but we live longer. According to the Mutation Accumulation Hypothesis (Ward et al. 2009) or the High Mortality Environment Hypothesis, menopause is simply an accidental consequence of ageing. According to the Oocyte Depletion Hypothesis (Bribiescas 2006) women are born with a given number of oocytes, and while most elements of the somatic system are capable of functioning along with longer lifespan, oocytes deplete, therefore the reproductive function ceases. These hypotheses are usually justified by stating that longer lifespan is a consequence of improved life conditions and available medicines (Brent et al. 2015; Croft et al. 2015). This approach is supported by the longer lifespan of animals held in captivity (Croft et al. 2015), however it is contradicted by the observations of hunting-foraging or pre-industrial human populations. The Aches Paraguay (Bribiescas 2006) or the 17–18th century plantation slaves in Trinidad (Croft et al. 2015) were able to attain a long lifespan despite extremely harsh conditions. According to the followers of adaptive theories, in the course of female fertility there comes a point when at the balancing of advantages and disadvantages the risks of the mother with a new pregnancy will exceed the advantages of giving birth to a new infant. In this case the mother can increase her own inclusive fitness by improving the chances of the already living children, i.e. supporting the rearing of grandchildren (Alvarez 2000). In the evolution history of humans both the paternal and maternal grandparents have helping roles, but, on the one hand, it is not general (there are some pre-industrial societies where among certain conditions they are detrimental to fertility (Coall & Hertwig 2010), and, on the other hand, this role is quite variable considering both its form and intensity (Peccei 1995). An evidence for non-adaptivity of menopause may be that apparently the female body is not prepared for it, and the accompanying hormonal changes pose serious challenges (Kachel & Premo 2012).

2.3. Grandmother-centred hypotheses

It could have been seen that the starting point of a part of the adaptive theories is that the benefit of the lengthened non-fertile lifespan is the presence of grandmothers in the rearing of the grandchildren. The Grandmother Hypothesis was described by Hawkes (2014) after studying the hunting-foraging Hadza tribe. The warm and wet environment in Africa had been changed in the Plio-Pleistocene epoch by a cold and arid climate. Acquiring food became harder, food became less available or available only in certain periods of the year. The consumption of tubers solved the problem of nutrition, but it was necessary to have physical power and knowledge to find, process and prepare them (Hawkes 2014; Driscoll 2009; Loffler 2016; O'Connell et al. 1999). According to the basic statements of Hawkes' theory (2014) 1) the menarche age of human life is adjusted to the full lifespan and not to menopause; 2) the reason of the existence of a post-reproductive life span is that women could support the fertility of their daughters; 3) in the presence of grandmothers, mothers wean their infants sooner. The human child is not able the defend and feed themselves until the age of 5, and this capability also remains quite limited until puberty (Shanley et al. 2007), therefore the child needs the help of carers. Despite this the interbirth interval is around 3 years of age among hunting-foraging tribes, and this age comes much later in primates (8 years among orangutans and 4–5 years among chimpanzee) (Sear & Mace 2007). The allocare provided by grandmothers facilitates earlier weaning, since the grandmother is present to give safe help to weanlings, and in such a way contributes to the earlier next childbearing of her daughter. This increased annual fecundity supported the growth and spread of the human species (O'Connell et al. 1999; Kramer & Russel 2014; Galbarczyk & Jasienska 2013).

2.4. Male-centred hypotheses

The greatest defect of the widely acknowledged theory of Hawkes (2014) is that it does not explain the longer lifespan of males and neither the longer reproductive lifespan of males (Driscoll 2009). However, in his mathematical evolutionary fitness model Chan can explain the lengthening of male lifespan with the grandmothering phenomenon (Chan et al. 2016). Alvarez (2000) tested and developed further the theory of Hawkes (2014). According to Alvarez proper nutrition necessitated the hunting made by men, therefore their lengthening lifespan also contributed to the increasing number of children. This theory supposed strict monogamy and paternity certainty. This assumption is in part supported by the fact that even if men do not become biologically infertile, some kind of behavioural infertility can be observed among them (Greve & Bjorklund 2009). Marlowe's Patriarch Hypothesis (2000), however, uses a completely male-sided approach. According to Marlowe, longevity could have been developed because the use of tools changed strength-based competition, therefore the more experienced, cleverer men had been able to hold their high status over the top of their physical prowess (Ragsdale 2004). As a consequence, the

longevity allele has appeared – and since its inheritance was not bound to chromosome Y, it exerted an effect also on female lifespan (MARLOWE 2000).

2.5. The Embodied Theory Hypothesis

KAPLAN and colleagues (2015) explained both the phenomena of longevity and menopause with the increased educational necessity. Due to climate change, acquiring food became a more complex task. Tubers had to be found, game to be trapped, larger animals to be hunted down (and injuries had to be avoided during the hunt), and learning these skills took a longer period of time. The basis of the Embodied Theory Hypothesis is that the objective of rearing a child is not simply to reach adulthood, but also to provide the greatest possible socio-economic status. In the long term, this facilitates successful partner selection and the efficient inheritance of genes. Thus parental investments serve as a capital, and gaining this capital necessitated a longer period of youth. This explains slow development, longevity, the enhanced transfer between generations (one assurance for this being menopause among others) and also the low fertility that can be observed nowadays (KAPLAN et al. 2015). Undoubtedly this is the theory that deals in a most complex way with the issue of longevity, but considering that the skills of foraging can be obtained in a shorter period of time than those of hunting (may be even 30–40 years) this hypothesis does not answer the longer lifespan of females, and neither does Marlowe's Patriarch Hypothesis.

2.6. Other hypotheses

Several authors have tried to explain longer female lifespan not exclusively with grandmothering. According to the Helpful or Good Mother Hypothesis it is a sufficient reason in itself that longer life is necessary to keep the last child alive, while risks of late pregnancy and childbirth must be avoided (COALL & HERTWIG 2010; KACHEL & PREMO 2012). The Reproductive Conflict Hypothesis states that the appearance of cooperative behaviour played a significant role in the timing of menopause. By decreasing reproductive competition also the intergenerational conflict subsided, and this increased the survival chances of offspring. In a natural state among humans, the overlap in the fertility of generations is practically zero (CROFT et al. 2015; SKJÆRVØ & RØSKAFT 2013). This theory is supported by the observation that the time of menopause and menarche are closely interrelated (GALBARCZYK & JASIENSKA 2013). Avoiding generation conflict is such an important social factor that in several cultures (e.g. among gipsies in Hungary) the 'grandmother rule' is still in force. This rule dictates that a woman shall not have more children if her daughter has become a mother (DURST 2006).

Increased lifespan is explained by the development of the human brain according to the Attentive Mother, the Good Mother, the Prudent Mother, and the Alternative Lifespan Hypotheses. Due to encephalisation, newborns are born in a more and

more incapable and immature state, they need more and more intense and longer care, and this has increased parents' lifespans as well (Peccei 1995; Ward et al. 2009; Ragsdale 2004). According to this hypothesis the length of the post-reproductive life-span is precisely equal to the time needed to properly rear the last child.

Grandmothers can provide the greatest possible inclusive fitness not just through direct care. In a network theory approach a woman in the post-reproductive life stage has significantly more chance to form weak ties (loose acquaintances), since these relations do not pose potential disloyalty threat to her partner, and weak ties stabilise the system i.e. the community. The consequence of stability is an increasing fertility and a greater survival (Csermely 2005).

2.7. The power of genes

A central concept of the evolutionary grandmother, grandfather and other hypotheses is inclusive fitness. The objective of resource allocation is to inherit own genes even if parents have to waive their own child with a potential 50% inheritance for the sake of a grandchild with weaker resemblance. Indiscriminate grandmothering can be observed even in hunting-foraging, post-industrial and modern societies (Chan et al. 2016; Sear & Coall 2011). According to the Confidence of Paternity hypothesis, grandmothers were more likely to help their daughters in the rearing of their children than the family of their sons, because they could be more certain that the grandchildren were theirs (Garrard & Strassmann 2011). Based on the closeness of genetic relation, resemblance can be determined most certainly with the maternal grandmother, this is followed by the maternal grandfather and the paternal grandmother, and the most uncertain is the paternal grandfather. Due to the inheritance characteristics of chromosome X the grandparental chromosome is born most certainly by male grandchildren in case of maternal grandmothers, and by female grandchildren in the case of not paternal grandmothers. The presence of this in the practice of care has been proven by numerous studies (Coall & Hertwig 2011; Tanskanen et al. 2011; Johow et al. 2011).

3. The role of grandparents

3.1. History of grandparents

The role of grandparents during the period of our written history is quite scarcely known; historical sources are primarily available from the last couple of centuries. According to these sources it can be stated that grandparents have probably always played a significant role in the maintenance of families, by maintaining the safety (and therefore the inclusive fitness) of the family. A recent, widely spread opinion stating that grandparenting appeared generally only in the 20th century is false. In 18th century France half of the grandparents still lived at the time of the birth of their grandchild, and though only one-third of grandparents survived until the 10th birthday of

their grandchild, grandparental presence was very significant in the most critical survival period of grandchildren (Gourdon 1999). Obviously when culture and man-made environment started to overwrite evolutionary orders, the mechanism of grandparents' (and most importantly that of grandmothers') activity and its consequences changed. However, it can be stated that both the number of births and the probability of survival were greater in the presence of grandparents. Their roles were quite diverse as we can reconstruct from these sources: they provided food for the family of the adult child, they transferred knowledge and experience especially for the grandchildren in dangerous (but considered normative) periods (such as weaning, when the breast milk has to be changed to food that can be found in the environment), and they also functioned as experienced midwives (Greve & Bjorklund 2009). According to data from 18–19th century Cambridgeshire, the maternal grandmother had taken a role in the survival of the mother and partly independently from that in the survival of the grandchildren, but had no effect on the period between births. (Ragsdale 2004). A similar result was deducted by Tymicki (2004), who found correlation between the presence of grandmothers and the number of grandchildren and the survival ration of grandchildren based on 18–20th century data from Poland. Data from 18–19th century Germany (Krummhörn) show a faintly more complex picture. Although the impact of the maternal grandparent is indisputable, having a positive effect on fertility, but the extent and significance of this depends on the socio-economic status, primarily on land ownership (landless vs farmer families; Johow & Voland 2012). Analysis of data from Costa Rica from the period of 1500 and 1900 also showed an impact. The longevity was correlated with the number of own children (and their survival), but negatively affected the fertility of their daughter (Madrigal & Melendez-Obando 2008). This contradicts the grandmother hypothesis, though supports the supposition that the grandmother has a significant role in the family. The study of the reasons of negative effect necessitates deeper cultural and social analysis.

3.2. The timing of grandparenthood

Grandparenting is barely a concept interpreted with consensus. It has a different normative meaning in every culture and society, and may also have a different connotation for the individuals depending on their attitude, age and family situation (Leopold & Skopek 2015b, Stelle et al. 2010). To better understand the concept of grandparenting, first we must know *who and when* becomes a grandparent.

Considering the characteristic fertility trends of the Western societies, and, on the other hand, taking into account the phenomenon of teenage pregnancies of significant prevalence (Szinovacz 1998); becoming a grandparent (transition) in the 21st century may commence anywhere between the age of 30 and 110 (Thiele & Whelan 2006). However, transition commences in the Western societies generally between the age of 46 and 57 – somewhat earlier in the United States (46–49), but slightly later in Canada (54–57) and in the Netherlands (52–55) (Leopold & Skopek 2015b).

The average age of becoming a grandparent is an important factor, since the deviation from this may cause role conflicts and discomfort, and this may reduce the positive effects of grandparenting both for the grandchildren and the grandparents (Lavers & Sonuga-Barke 1997; Leopold & Skopek 2015b). Off-time grandparenting means a greater pressure, hinders individuals in adjusting their expectations and plans to their new role possibilities, and they may also become isolated, since they cannot expect help and support from their (not yet grandparent) friends, individuals of the same age (Lavers & Sonuga-Barke 1997). This also increases the probability of dysfunctional grandparenting (Drew et al. 1998).

3.3. Personal and social dimension of grandparenting

According to Robertson (1977), experiencing grandmotherhood can be classified along two axes. The personal axis indicates how important grandmotherhood is in the personal identity, i.e. to what extent it plays a central role in the life of the person. The social axis represents the importance of the adaptation to external norms. Based on this typology, 4 types of grandmothers can be distinguished:

a) Apportioned style: both factors are important for the individual, grandmotherhood is a central role for her, the grandmother-grandchildren relation is perceived as a happy relation for both parties, and the individual proudly bears the role of grandmother that is important for the society.
b) Individualised style: finds joy in spending time with grandchildren, but it is not important for her what society thinks about her; she lives in a more isolated manner with few external relationships.
c) Symbolic style: the role model and the transfer of ethical norms are important for her, but does not expect emotional satisfaction from this task; grandmotherhood is not a real source of joy for her.
d) Remote style: neither the social role nor the personal joy are important for her, and she barely invests into the relationship.

3.4. Role conflicts

A new type of family has been created by (extreme) ageing and low fertility, the so-called beanpole family characterised by expanding vertical and declining horizontal extension. This means that 3–4 generations of family members are still alive, but their numbers are small (Szinovacz 1998). In such a family structure the role of grandmother is in competition with three other roles: the parent, filial and worker roles (Leopold & Skopek 2015a). Role conflicts greatly depend on the timing of transition (becoming a grandparent). In most societies the role of grandmother is in no overlap with the parental role since the number of children is lower, and in case of near childbirths there are no child demanding care in the household, but there is an increasing chance that at least one predecessor is still living (Leopold & Skopek 2015b). Based on this the experiencing of roles can be usually characterised as follows: in the adult

life stage the individual takes the worker role, somewhat later this is joined by the parent role (the compatibility of these roles and the effect on fertility are discussed later) while the filial role is also present, though it does not require significant effort. After the side-lining of the significance of parent role the grandparent role emerges while the working role becomes stronger and more important, since the individual is at the peak of personal productivity, already with a great pool of experience, and the filial role starts to become stronger and more burdensome (Leopold & Skopek 2015a; Leopold & Skopek 2015b; Szinovacz 1998). The widely mentioned sandwich generation is not the generation of parents but more likely that of the grandparents (Szinovacz 1998). It is not strange that this generation will experience and perceive the role of grandmother as depressing, and grandparenting becomes a much more liberated, joyful task when the pressure decreases and one or more other roles are deprived of (Leopold & Skopek 2015b).

3.5. Grandparenting types

As it can be seen from the evolutionary and historical consideration, the basic role of grandmothers has been the material and natural support of the family in a potentially risky, dangerous environment. Shifting social conditions also mean changing grandparental roles as it has been tried to be explored by numerous studies (Neugarten & Weinstein 1964; Dellmann-Jenkins et al. 2005; Drew et al. 1998; Mann 2007; Henry et al. 1992; Gauthier 2002; Stelle et al. 2010). The typology of Neugarten and Weinstein consists of five types (1964): fun-seeker (the grandchild is basically a source of joy for the individual, the grandchild is pampered, they spend a lot of time together), formal (a distant, respectful relationship characteristic of older grandparents), distant (characteristic of younger individuals; grandparenting is only one among the tasks), reservoir or family wisdom (story-teller who transfers family values, cultural heritage through fairy tales) and surrogate parent (completely taking over the role of parents). Gauthier (2002) distinguished four main types: educational subcontractor (strong relationship with daily presence, indispensable help), specialist (two subtypes can be differentiated: club-grandparent and incalculating root – they appear only casually, the meaning of them is close to fun-seeker or reservoir of family wisdom) and passive (subtypes are: quasi-absent – no close relationship can be formed since there are too many grandchildren, but the individual is available if needed; and the absent – due to deteriorated relation the connection with the parents has been broken). Obviously, these roles do not exclude one another, and different types can be dominant in various stages of life (Gauthier 2002). Beside the two most accepted typologies other works of research tried to fathom the tasks belonging to grandparenting. In Stelle's summary (Stelle et al. 2010) the following concepts appeared: national guard, watchdog, arbitrator, stress buffer, roots, values elder, mentor, conveyer of family legacy and culture, silent saviour of children from faltering families, surrogate parent.

3.6. Grandfathers

Works scarcely distinguish between grandfathers and grandmothers due to various reasons. Usually they are both present in the life of grandparents (Gauthier 2002) and their impact is inseparable. In case of widowhood, survival of the grandmother is more frequent. However, grandparenting is fundamentally a feminised concept (Mann 2007), grandfathers do not consider this role as central in their life and usually spend less time with it (Leopold & Skopek 2014). According to most of the works, grandfatherhood does not significantly differ from grandmotherhood in our present days (Drew et al. 1998), though Smorti and colleagues (2012) mention that grandfathers are more likely included into active, sport-like activities, while grandmothers more likely take part in symbolic, language-related pastimes.

4. Effects of presence

4.1. Presence of grandparenthood

The importance of grandparental presence in the past is satisfactorily explained by the detailed life history theories. But what is the importance of grandparental presence in the fundamentally industrialised, low fertility, low mortality societies (Coall & Hertwig 2011)? In our days less healthy grandchildren are born indeed, but grandparental investment has not decreased. The basic skills, wealth and knowledge render the child more competitive in the industrial societies, the costs of education have increased exponentially (Coall & Hertwig 2010). The intensity of presence is an important factor in the analysis of impacts. This obviously greatly depends on the already detailed presence of other roles of the grandparent and the adjusting grandparent types. Do age, well-being, timing of transition and length of tenure play a role in the role of grandparents (Mann 2007)? In many cases presence does not depend on grandparents, but on parental expectations (Hank & Buber 2009). Bernal and de la Fuente (2007) describe that both grandparents and grandchildren experience the relation in a positive way, and they would increase its intensity, but parents limit this effort. It is characteristic to Western societies that child rearing is fundamentally considered as a task of the nuclear family, and they are not liable to open towards the grandparents (Aassve et al. 2011). Many authors tried to describe the probability of the extent of inclusion in the course of studying the phenomenon of grandparenthood. When studying the roles of grandmothers, Lavers and Sonuga-Barke (1997) distinguished four important factors:

a) the presumed need of the mother and the child,
b) the development phase and conditions of the grandmother,
c) the extent of agreement in rearing issues,
d) the ‘appropriateness’ of the extent of inclusion in cultural and interpersonal relations.

The study of Uhlenberg and Hammill (1998) depicts a similar system, but they showed the significance of six factors. These factors are as follows in the order of importance:

– geographic distance (closeness increases the frequency of meetings)
– quality of parent-grandparent relation (a good emotional relation serves as a base for the inclusion of grandparents)
– how many set of grandchildren must be cared for by the grandparent
– the gender of the grandparent (although there are some studies showing that the participation is becoming balanced, grandmothers are still more active)
– maternal or paternal grandparent (the stronger presence of the maternal grandparent still remains)
– marital status of the grandparent (married grandparents are more liable to help than single grandparents)

4.2. Grandparenthood – the invisible institution

Enhancement of fertility is regarded as an important objective in most western type countries. Among the measures with the most positive impacts, the following can be mentioned: affordable child care, parental leave or maternity leave, and measures for the reconciliation of work and childbearing (Duvander et al. 2010; Mörk et al. 2009; Baizan 2009). The relatively higher fertility ratio of the Scandinavian countries are attributed to the consequent family friendly policy that has been conducted in the last couple of years (Mörk et al. 2009; Duvander et al. 2010). In the socialist countries the state supported the institutions of childcare well above its capabilities (Ruzicska 2014), therefore a drastic setback in fertility could be observed in the period following the fall of the Iron Curtain (Leopold & Skopek 2015b). Besides the specific family policy measures of the countries and the traditional perception of family, the invisible 'grandmother institution' mayalso be a significant factor in the decisions concerning childbearing and fertility. The presence of this invisible institution is quite different. It is stronger in Southern Europe, the familialism in Italy and in Spain strongly leans on families, and in these countries the state provides less support compared to Scandinavian countries (Baizan 2009; Arpino et al. 2012). In the developed countries (where there is no family policy similar to the Scandinavian model) it can be observed that fertility and presence on the labour market is inversely proportionate, this, however, is not absolutely true for the developing countries. In China, where it is general that more generations live together, the presence of women in the labour market did not decrease after the abolition of the single child rule, due to the presence of the grandparent (Guo et al. 2017). Grandparental support is so obvious that a study conducted among German youth showed that the willingness for child-bearing was not increased by grandparental presence, but decreased by grandparental absence (non-presence) (Keim et al. 2012).

4.3. Advantages of active grandparenting

Although the objective of this study is to investigate the positive effects of grandparenting on the next generation, this is not a one-way process. Supportive, helping behaviour usually provides benefits for both parties. The helping party has a better general condition, health perception, wellbeing, suffers less functional limitation and may expect a longer lifespan (Hilbrand et al. 2017). One of the most rewarding, most important roles of late life is grandparenting (Leopold & Skopek 2015a), since caring for children comes with a higher sense of purpose, a greater joy of life (Fergusson et al. 1998) and a feeling of competence (Thiele & Whelan 2006). The tasks that come with grandparenting are quite exhausting both in a social and an emotional sense, and require a good cognitive capability. This may refer to the phenomenon that it is not grandparenthood or the tasks of grandparenting that conserve these capabilities, and only those people become active grandparents who are in a better condition anyway. However, studies show that independently of the baseline condition, grandparenting activity in itself helps to maintain physical and mental fitness (Burn et al. 2014).

But the extent of grandparental duty can make a difference. Most studies show that those who do not participate in any kind of grandparental activity and also those who do too much are in a worse condition than those performing a medium amount of tasks. Those grandparents who live in the same household with the grandchildren (Bulanda & Jendrek 2014) or spend at least 5 days a week with them perform worse in tests of cognitive performance, working memory performance and processing speed (Burn et al. 2014). A study from Hong Kong showed that too intense supporting in a given period or long-term grandparenting (with any kind of intensity) have similarly unfavourable effects. Lou (2011) found that the optimal duration of grandparenting is 2–6 years; beyond this interval the risk of physical deterioration and psychological distress increases significantly. Negative effects of grandparenting can also be observed in case of off-time transition. In such cases the associated stress increases, and this has a detrimental effect on both physical and mental health (Leopold & Skopek 2015a). Peterson's study (1999) traced back the negative effects of grandparenting to three reasons: 1) a foreign role compared to the youth image of self; 2) increasing (rearing) conflict with the parental age group; 3) they do not find joy in the activity and this raises further bad feelings in them. In this study one-third of grandmothers experienced bad feelings, but the majority mentioned positive feelings: contemplation of development, common activities, positive emotions, lack of responsibility and feeling proud.

4.4. Active grandparents, more successful grandchildren

Longer years of shared life (Leopold & Skopek 2015b) also means that though kin support is not absolutely necessary for survival, the significance of grandparents increases. Rearing of children becomes a more and more important investment (Coall & Hertwig 2011). Most studies investigated the effect of grandparents in

high risk families, where grandparental presence had an unequivocal and markedly positive impact, but the presence could have been shown also in intact, low-risk families (Coall & Hertwig 2011). The development and mental health of the children is impacted by everything they have experienced, therefore the surrounding network helps their development both directly and indirectly (Lavers & Sonuga-Barke 1997). Although grandparental advantages could be more emphatically valid for first-born children due to a longer shared life, the decreasing number of births and the decreasing difference between the first and the last childbearing minimises this difference (Szinovacz 1998). Younger grandparents can be more active, but later – supposedly due to the decreasing overlap in roles – they can help more efficiently in other areas. Independently of the age and other characteristics of parents, the grandchildren of older grandparents attained better verbal achievement (Leopold & Skopek 2015b). The grandparental effect has a dual impact. It can exert an effect via the parent, since the support of parents decreases the stress experienced in the family, improves the participation of parents in education, parental care, sensitivity, and the direct activity with the child supports the social, cognitive and motoric development of the grandchild (Lavers & Sonuga-Barke 1997; Coall & Hertwig 2011). However, some kind of negative effect can also be observed if the relation is too intense. Negative effects in certain areas have been observed primarily in those living in a common household. The academic achievement of those living in multigenerational households were similar to those where the presence of grandparents were more limited, but performed worse in socioemotional functioning (Pittman & Boswell 2007). Likewise during teenager pregnancies the grandmother can provide great help for the inexperienced young mother in the beginning, but if the mother is not able to move into an household of her own, conflicts occur and the positive effect of grandmotherhood cannot be realised (Lavers & Sonuga-Barke 1997).

4.5. Surrogate parents

The fifth element of grandparent typology (Neugarten & Weinstein 1964), the surrogate parenthood must be dealt with separately. The significance of surrogate parenthood is increasing, though due to the death of any of the parents they were also formerly considered as an important and primary substitution. Due to more prevalent substance use, mental, emotional problems and negligence the number of those who are rearing their grandchildren as surrogate or custodial parents is increasing (Gibson 2002; Green & Goodman 2010). In their case completely different impacts must be considered, since due to the increased quantity of tasks these grandparents are more prone to depression, deteriorating physical health (Harris 2013), social isolation and financial difficulties (Bulanda & Jendrek 2014; Kelley et al. 2000). The impact on grandchildren also show negative effects: worse developmental and academic skills, those are affecting them even independently of the original family environment (Pittman & Boswell 2007).

5. Grandparents and fertility today

As we have seen above, the importance of grandparents created by evolution had not disappeared by the appearance of civilisation, only altered in some extent. Despite the growing interest of theory creators and designers of practical research studies in the elderly population and grandparents, surprisingly few studies investigate the issue of fertility, though grandparental role had been originally designed for this purpose (Sear & Coall 2011). These studies include: the Italian Family and Social Subjects Survey (Aparicio-Fenoll & Vidal-Fernandezy 2015), the Kinship Panel Study (Thomese & Liefbroer 2013) and the Living Arrangements and Social Networks of Older Adults (with the follow-up study of Longitudinal Aging Study Amsterdam) (Kaptijn et al. 2010), both conducted in the Netherlands, the German Socio-Economic Panel (García-Morán & Kuehn 2017) and the German Family Panel (pairfam) (Pink 2017), the British Millennium Cohort Study (Tanskanen et al. 2014) and the 1970 British Cohort Study (Waynforth 2012). Comparative analysis of Bulgarian, French, Lithuanian and Norwegian data was facilitated by the Generations and Gender Surveys (Tanskanen & Rotkirch 2014) and the common survey of 11 European countries (Austria, Germany, Sweden, the Netherlands, Spain, Italy, France, Denmark, Switzerland, Belgium, Greece) titled Survey of Health, Aging and Retirement in Europe (Hank & Buber 2009; Aassve et al. 2012).

5.1. Studies on grandparental samples

5.1.1. Survey of Health, Aging and Retirement in Europe (SHARE)

SHARE (Hank & Buber 2009; Aassve et al. 2012) is a cross-national panel study that investigated the health status, the socio-economic status, and the social and family network of the elderly in 11 countries in two waves (2004 and 2006). All responders above 50 years of age who had at least one adult (fertile age) child aged between 20 and 49 years were included into the analysis. The elderly were asked whether they help their children or not, if yes, how frequently, and whether there is any difference among their children. Studies did not always reflect former expectations. In those countries which are traditionally family centred (Italy, Spain) the extent of childcare done by grandparents was lower than that in Denmark, the Netherlands or Sweden. It is important to consider that there are significant differences between these countries concerning the labour market position of women. In the Mediterranean countries where the childcare institution system is less available women are less likely to work beside their small children, so they do not need regular help from grandparents (Hank& Buber 2009). However, it was a general result of the survey that the presence of grandparental help – in case the already existing child (even one's own or that of a sibling) is above 3 years of age, so the burdens on grandparents are expected to decrease – enhances the chance of the birth of a next child (Aassve et al. 2012). It can be well observed from the results and country-wise differences of SHARE that

by the correlations of grandparental help, presence and fertility, further modifying factors shall be considered: mainly the labour market situation of women and the institutional structure (Coall & Hertwig 2010).

5.1.2. Living Arrangements and Social Networks of Older Adults (LSN) and Longitudinal Aging Study Amsterdam (LASA)

In the first wave of this survey the LSN (Kaptijn et al. 2010) asked elderly Dutch people aged between 54 and 84 years in 1992. In the course of interviews questions about children, grandchildren and ways of maintaining relationships and help were put. The LASA follow-up study conducted between 2000 and 2002 contacted the former interviewees who were still alive (and had not disappeared due to any other reasons). Thus 352 grandparents were included in the survey. They all had at least one child at the time of the first interview, and their children were below 40 years of age (therefore it was not improbable that, based on their age, they would have more children). Results also showed here that those parents who could expect regular help from the grandparents had a greater chance of bearing a next child in the next 8–10 years, but occasional help from grandparents did not have a significant impact.

5.2. Minor surveys conducted on parental samples

5.2.1. Generations and Gender Surveys (GGS)

This research (Tanskanen & Rotkirch 2014) surveyed the correlations of social support, financial circumstances, education and fertility in four European countries. Representative samples were selected in 2005 in France, in 2007–2008 in Norway, in 2004 in Bulgaria and in 2006 in Lithuania. Only those mothers were included in the analysis of this study who were below 45 years of age and had at least one child below 14 years of age at the time of the survey (approximately 3500 women). Results showed that grandparental inclusion correlated with the increased willingness of childbearing, but this was greatly dependent on the country, the socio-economic situation and kin lineage. In countries and households with more stable economic situations (France and Norway) the grandparental (mainly emotional) support positively affected fertility, it gave that 'extra' push that was needed to bear a new child. In Bulgaria and Lithuania the correlations were not so close, though childcare help in Lithuania and emotional support in Bulgaria did somewhat promote the bearing of the second-third child.

5.2.2. Family and Social Subjects Survey

The basis of the survey (Aparicio-Fenoll & Vidal-Fernandezy 2015) was the second and third waves of an Italian panel survey (conducted in 2003 and 2009) from which the authors analysed the data on women between 20 and 40 years of age

(approximatively 2000 women). The questions were directed to demographic characteristics, types and frequency of family interactions and labour market situation. The authors found that since the childcare of grandparents reduces the total cost associated with the child, it increases fertility. However, the possibility of grandparental childcare is decreased if the grandmother still works. Here is a clash between the two types of transfer a grandmother can provide for her children: material support and time. If the grandmother is present, it always has a positive effect on fertility, but in case of non-working grandmothers the labour market presence of mothers is increased. On the basis of these findings the Italian family policy decision makers have to ponder, which solution is the most profitable in terms of economy-fertility. The first solution is that the grandmother works and the mother is at home with the child. The alternative is that by regulating the age limit of retirement the enhanced grandparental support is facilitated, thus increasing the presence of mothers on the labour market.

5.2.3. Kinship Panel Study

The two waves of this Dutch panel survey (Thomese & Liefbroer 2013) were conducted between 2002–2004 and 2006–2007. Altogether 900 people were included between 18 and 49 years of age with a constant partner, having at least one child and a living parent, and the woman living in the affected household should work (either the interviewed person or his partner). Results showed that grandparents were better involved in child rearing tasks if there were no available or appropriate formal care opportunity, and the support both from maternal and paternal grandparents increased the probability of bearing a new child in the examined period of three years.

5.2.4. German Socio-Economic Panel (SOEP)

The SOEP (García-Morán & Kuehn 2017) is a household panel survey conducted in five waves (1991, 1996, 2001, 2006 and 2011). Researchers selected those women between 20 and 40 years of age (approx. 11000 persons) who worked as employees, provided information on their salary and on the distance grandparents live from their home. The aim of this study was to determine the correlation between labour market presence and availability of grandparental help with fertility. Results showed that those who live closer to any of the grandparents rear more children and are more likely to be present on the labour market. Although causality is questionable, it can be observed that these persons usually have lower salaries, thus it is likely that they must make compromises in work in order to maintain the closeness to grandparents.

5.2.5. German Family Panel (pairfam)

Similarly to the SOEP study, pairfam (Pink 2017) also used the distance between the place of residence of parents and grandparents as a tool to measure grandparental

help. Pairfam is an annually recorded panel study conducted between 2008 and 2013, containing the data of three birth cohorts (1971–73, 1981–83 and 1991–93). Authors included those female members of the two younger cohorts into the analysis who had been childless at the time of the first interview, had no reason that would exclude child bearing (homosexuality, disease etc.), and who provided information on the living place of grandparents (approx. 3000 women). The aim of the analysis was to determine the timing of parenthood. Those women who could expect a travel time of less than 30 minutes and thus more help, gave birth to their child sooner. However, this was not true for people living in the same household (for them, gaining independence before childbearing was probably a more important factor).

5.2.6. Millennium Cohort Study (MCS)

MCS (Tanskanen et al. 2014) studied the cohort of children born at the beginning of the millennium in Great Britain. The first wave was recorded nine months after birth in 2000–2001 and the second wave took place five years later, in 2006–2007. A family database of 10,000 persons was created, and women above 40 years were excluded from the analysis for it was improbable that they would bear a next child. The measure of support was the number of meetings between parents and grandparents. Although couples could expect help primarily from the maternal grandparents (and mainly from the grandmother), even in this case, interestingly, the support from the paternal grandparents (both grandmother and grandfather) had a positive effect on the bearing of the next child, and what's more, the presence of the maternal grandparent had a *negative* impact on the bearing of the third or further children. The causes are not obvious, but it is probable that the maternal grandmother – as the person who is involved the most – is interested in maintaining a condition where her daughter's family is not larger than the average, since it would increase her burden.

5.2.7. 1970 British Cohort Study (BCS70)

BCS70 (Waynforth 2012) is the cohort of people born between April 5 and 11 in 1970 in Great Britain. Data were recorded at regular intervals (5–10 years), and the phone interviews made at the age of 30 and 34 were included in this analysis. Respondents (n = 12000) were asked what type of help they used to get from their parents, how close they feel themselves to their parents, and how often do they meet. The material or accommodation support from parents affected child bearing negatively in the specific four-year-long period, however those women who felt themselves closer to their parents had a greater chance to give birth to a child, and also more frequent meetings with the parents increased the probability of birth. Answers showed that primarily neither the material support nor the direct childcare are the main decisive factors, but the opportunity that it is possible to lean on the broader family for a longer term.

6. Summary

In our study we investigated why the particularly long lifespan of the human species, the menopause and the following long active but infertile life phase of females have been developed, and what impact it has had on the spreading of the human species. We explained the role and impacts of grandmotherhood and grandfatherhood in a changing and civilised environment starting out from evolutionary theories. We saw that the presence of the grandmother had had a positive effect on fertility and the survival of the species in the early development stages of humans even in the communities of the age of the industrial revolution (with appropriate written demographic data) and also in the relatively intact, hunting-foraging societies of the present days. Even in the developed societies more and more studies focus on the social benefits of the elderly, the positive impacts of grandparenting on the physical or mental health and well-being of parents and grandchildren. Several works investigated the impacts of grandparenting on fertility, the benefits of grandparental presence and their emotional, natural or material support on the child-bearing decisions of parents. We possess more and more information on the attitude, behaviours and characteristics of older generations, and on what contents and perceptions the grandparent role means for individuals under different conditions. To better understand the impacts of grandparents on fertility or altogether the well-being and success of the next generation, studies should not only consider the frequency and intensity of meetings and the main forms of support, but should also investigate the attitudes and role identities associated with grandparenthood and the timing of becoming a grandparent.

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