

# Epigenetics, Parenthood and Responsibility for Children

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Those who contribute biologically to a child's identity are commonly seen as that child's biological parents. While people who raise a child will of course have a great impact on the child's potential to flourish, they will not do so as biological contributors: they can only contribute in other ways. This divide between biological and social contributors to children's lives has often been taken for granted in discussions of parenthood, responsibility for children and the meaning of biology in determining relationships with children. For those who place great value on the biological, or, more specifically, on the genetic link between parents and children, the divide is clear and meaningful. Different people may form parent-like relationships with children, but the question of who our biological parents are has a clear answer: they are those who we are made of – those who determine our biology – and our biology is determined by our genetics. Moreover, people who create children biologically are often seen *prima facie* as the children's parents and holders of a special kind of responsibility in relation to them. Children are made by their biological parents, and their very biology depends on that of their biological parents.

That straightforward determination is being challenged by an increasingly profound understanding of the inter-dependent relationship between genes and the environment. Findings in epigenetics suggest that the environment in which a child is raised influences which of their genes are expressed and how, in ways that seem to be heritable. In this way, epigenetics blurs the boundary between genetics and the environment, and thus allows an analysis of contributions to children's lives that goes beyond classical dualistic categories such as genetic versus environmental or biological versus social. It is this analysis that I plan to undertake in this chapter, against the background of the attribution of parenthood and moral responsibility for children.

I start by briefly reviewing some ways in which responsibility for children has been conceptualized philosophically. I then look at the tension between biological parenthood and social recognition of parental status (and, implicitly, responsibility for children). I analyse the implications of findings in epigenetics for the ascription of biological parenthood, and explore broadly shared understandings of procreative responsibility, assessing its extension to include all (individual or collective) actors that determine a child's biology. Throughout the chapter, I problematize the focus on genetics and biology in the ascription of moral responsibility for children, using the example of epigenetics as a crossover between social and genetic factors that contribute to a child's life. By the end of the chapter, I aim to show that 'it takes a village' to make a child who that child is. 'Biological parents' (whatever that means) may be the ones who bring a child into this world. However, much of the child's life will depend, not only socially but also biologically, on the experiences and choices of many more people as well as on a host of other circumstances, many of which are beyond these people's control. Ascription of responsibility for children needs to reflect this complexity.

## **Moral responsibility for children**

As we have already seen in this volume, there are many ways of conceptualizing and understanding moral responsibility.<sup>1</sup> Moral responsibility may be prospective: for example, we may say that a person becomes responsible for a child as a result of taking on a care-taking role. Responsibility may also be retrospective: one may say, for example, that someone who participated in the creation of a child is thereby responsible for that child. When we talk about responsibility, we may mean one or the other of these, or both. In relation to children specifically, the question of who has moral responsibility may be raised in order to determine either retrospective responsibility or prospective responsibility for them. These are different questions.

Both morally and legally, children's interests and vulnerability are the basis for responsibilities held by other moral agents. Throughout the Western world, the primary holders of moral responsibility for children are, by default, those who are recognized as their parents. Because parental responsibilities are often codified into laws, they are ascribed to whoever is the child's legal parent, which then extinguishes 'competing' responsibilities on the side of those who are not the legal parents. Parent-child relationships are commonly seen as binary and exclusive: it is the legal parent who bears parental responsibility, and (in most legislatures) no more than two adults can be a child's legal parents. If one is not the parent, one has at most some temporary and well circumscribed responsibilities brought on by one's role, such as that of a nanny or a teacher. However, the parents have control over these relationships: for example, they can fire the nanny or move the child

to another school. This status quo rests on the assumption that parental responsibility trumps any other responsibilities for specific children. Of course, this does not mean that parents' decisions cannot be questioned. Children have rights and are entitled to protection by the state, even from their own parents. But, unless there are serious reasons to suspect that parents have acted severely against their children's interests, their discretion in a variety of matters will typically go largely unchallenged. How strong these reasons must be, and how severe the actions must be that trigger state interventions, differs significantly between countries.

One feature of the recognition and formalization of responsibilities for children is the conviction that children belong with their biological parents, and that therefore responsibility for children rests primarily with the biological parents. This conviction survives despite being contested socially, ethically and legally (Cutas and Chan, 2012). Innovations in human reproduction challenge this assumption. Practices such as gamete and embryo donation have increased the number of children who are born into families with whom they do not share a genetic link. This makes it more complex to determine who should be allowed to develop or maintain relationships with these children. Furthermore, developments in the justification of parental rights also call into question the presumption in favour of the biological parents: if parental rights are grounded in the interests of children, then genetic connections are no longer central – or are altogether irrelevant – unless it is in the interests of the children that they are so recognized. Meanwhile, in some European countries, regulations in areas such as immigration use DNA as evidence of parent–child relationships. In some US states, men can demand DNA testing and have their genetic parentage acknowledged against the wishes of the husband of the mother and the child's legal father (Carbone and Cahn, 2011; Smajdor and Cutas, 2014). So, while in some ways, Western societies are moving away from biological accounts of parenthood, in others they reinforce them.

Gamete donors and other participants in fertility treatments have often been represented as simply providing a service, product or treatment. However, it has been argued that we should subject these contributions to a broader notion of responsibility that may be procreative but not parental (Fahmy, 2013). Such an endeavour allows examination of procreative responsibility independently of parental responsibility. The people who contributed to bringing the child into existence thereby acquire responsibility for that child whether their contribution was biological or not, and whether they are to be recognized as the child's parents or not. This distinction between procreative and parental responsibility will also be useful when, later in this chapter, we look at biological influences onto children's lives that are neither parental nor procreative but may shape children's biology.

A related distinction in discourses on moral responsibility for children is that between primary and secondary responsibilities (Macleod, 2007). While parents have primary moral responsibility for their children, other parties may have secondary responsibilities for them. These parties may include not only gamete donors and other individual participants in the creation and life of the children but also collective units such as schools, hospitals or states. This allows the parents to function as core decision-makers on behalf of their children, while other individuals or groups may have concurrent, but more diluted, responsibilities for them. In practice, what happens when the exercise of secondary responsibilities for children clashes with parental responsibilities depends on the legislature. In some countries, such as the UK, going against parents' decisions, when these are deemed to be against the child's interest, is a fairly straightforward process. In others, there is much more deference to parental authority even where there are good reasons to believe that the parents are acting against a child's interests (Wilkinson and Savulescu, 2018).

Other sources of responsibility for children may ensue from relationships with children that have led them to form attachments. People's personal and social connections are perceived as much more fluid than genetic or family relationships (Braithwaite, 2010; Brake, 2012). Expectations that people behave in certain ways, or are warranted certain protections of their relationships, are much stronger in the case of parent-child relationships. Parents are entitled to exclude other people from their children's lives arbitrarily, and in general they enjoy comprehensive privileges in relation to their children, regardless of the children's or anyone else's interests (Bartlett, 1984; Gheaus, 2017). This exclusivity renders invisible some connections and attachments that may be extremely important for the children and for adults who are not their legal parents. While the exclusivity is increasingly being challenged,<sup>2</sup> it is still pervasive. Although it may help to simplify the exercise of societal responsibility for children, by placing it almost entirely with the legal parents, this may not be compatible with current views regarding the moral status of children and the importance of their interests.

Changes in views on the moral status of children and the conceptualization of responsibility for them have significant implications not only for parent-child relationships but also for the relationship between parents as well as that between parents and other parties, including society in general. Together with changes in patterns of relationships between adults and expectations of and from parents, these call for a restructuring of relationships between parents. Co-parenting is gradually replacing marriage as that which binds parents and generates lasting responsibilities, not only for their children, but for each other as sharers in parenting (Cook, 2012; Cutas and Hohl, 2021). This restructuring of adult relationships also leads to the question of whether parents should allow, encourage and nurture

the connections that their children may have with others, and organize their own lives accordingly.

Some authors go even further than this to question the very use of adult perspectives when analyzing moral responsibility for children. For example, [Wiesemann \(2016\)](#) argues that what consolidates the duty to recognize children as moral agents is their trust and vulnerability, rather than their (potential for) autonomy as defined by adults. She uses the term ‘moral adulthood’ to describe the tendency to ‘translate’ children’s lives and interests in terms of adults’ interests and adult values, or possibly children’s future interests as adults (which may even be given precedence over their interests as children). Moral adulthood, argues Wiesemann, stands in the way of actually, substantially, recognizing children as the moral equals of adults. Rather than seeing them and respecting them for who they are, we are projecting our own, adult, perspective onto them.

In short, responsibility for children may be prospective or retrospective, parental or non-parental, parental or procreative, maternal or paternal, primary or secondary, individual or collective. While responsibility for children tracks biological contributions to children’s lives, it also responds to the recognition and promotion of the types of relationships between adults. At the same time, changing legal and moral conceptions of children’s moral status and the justification of adults’ claims to children also change the basis for the recognition of relationships with children and the ascription and content of responsibilities for them.

## **Biology, responsibility and parenthood**

A woman and a man love each other very much, get married (to each other!), and together have one or several children. This is a family. The woman and the man then are the parents of the children they have created and are responsible for them. The children will display a combination of their parents’ traits and genetic potential. Sure, some children arise out of a more fortunate combination of gene pools than others, but such is life. Restricting people’s liberty to ‘found a family’ is associated with eugenics and has a particularly dark recent history. It is accepted – and indeed seen as self-evident throughout the Western world – that people should make their own decisions about who they want to reproduce with, and that they are responsible for the children resulting from these unions. There are only a few situations in which there may be an expectation that these choices take into account the impact on children. These situations include serious conditions that would dramatically affect the children’s potential to flourish. Beyond such extreme cases, people are able to make their decisions freely, and it is only their post-conception decisions that may be questioned.

Once the child is conceived, the woman and the man are not always seen as equally responsible for the children they have together. The biological differences between women's and men's contribution to children's existence have been taken to imply that women have far greater moral responsibility for their future children. Against the background of progress in medicine and genetics, pregnancy has made the female body vulnerable to increasingly far-reaching demands (Smajdor, 2011; Kukla, 2016). Women are expected to refrain from anything that could possibly harm their children before they are born or even conceived. In the UK, all expectant mothers are encouraged to get tested for carbon monoxide to detect whether they smoke (Gregory, 2019). Guidelines urge women who are planning a pregnancy, as well as expectant mothers, not to consume alcohol at all (Department of Health, 2016). That women may conceive and be pregnant is also one of the reasons why women have been excluded from many types of medical research for a long time. The same standards tend not to be applied to men. The question of whether fertile men should refrain from drinking alcohol or smoking, in order to avoid risks to potential children that they may have, is so striking that it has recently made the rounds on social media as a sarcastic, humorous proposal. However, lifestyle factors including smoking or the consumption of alcohol also have an impact on male reproductive tissue, and do so early on in life. While there is research connecting the quality of male reproductive tissue with health risks to the child, this evidence tends to be absent in the policing of reproductive choices, which primarily affects women (Hens, 2017).

Legally, the story of the woman and the man, and the family they found together, can diverge from the facts of biological (and especially genetic) reproduction. The script lives a life of its own: by default, it is the woman and her husband who form a sanctioned family form. The biological father may be someone else. Or the couple may have had IVF and (1) egg donation, (2) sperm donation, or (3) both, and so possibly neither is genetically related to the child. Or they may have had their child(ren) with help from a surrogate mother, in which case it is the man and the surrogate mother who are the biological parents (if the surrogate mother also contributed the egg) or the three of them (if the wife contributed the egg), or the man and the surrogate mother and the egg donor (if someone else contributed the egg), or the surrogate mother and the egg donor and the sperm donor. If mitochondrial donation<sup>3</sup> is also involved, then yet another person may also have contributed biologically.

Although legal default parenthood and biological procreation need not completely overlap, biological contribution and parenthood are connected in the parenthood script that many of us operate with either consciously or not. A liberalization of parenthood status to include all these types of connections simultaneously is not in sight. This would clash with another

firmly held expectation about parenthood: that every child can have no more than two parents. As we have seen in the previous section, ideas of moral responsibility for children are being adjusted in light of a broader understanding of children's moral status and the many ways in which children have been unjustifiably undervalued (see also [Gheaus et al, 2019](#)). However, this has not yet led to children no longer being attributed to pairs of adults and to relationships between adults no longer determining parental status.

The idea that biology entails parenthood and the idea of the legitimate (married) couple as the model for respectable parenthood have in common the view that child(ren) are in one way or another generated by their parents. The children are made either from others' biological contributions or from their parents' reproductive projects. Ideally, these coincide: the birth mother is the genetic mother and the biological father is her husband. The expectation that children are made by their biological progenitors and that this fact forms the basis of claims over them (such as parenthood) is subject to a number of complications, not only, as we see in the next section, from new understandings of epigenetics, but also from other biological possibilities. These include the splitting of biological motherhood into two, made possible by surrogate motherhood and embryo transfer. More intriguingly, it has been found that DNA from (male) fetuses travels to and remains in their gestational mother's brain long after pregnancy ([Chan et al, 2012](#)). Scientists speculate that this 'colonization' of the mother is not accidental and has a purpose: the benefit of the fetus ([Boddy et al, 2015](#)). If this is true, and if contributing to the biology of a person is parenthood, then the fetus may be said to become his mother's parent. Or, if we are to abstain from using parenthood language, he will become a biological contributor to his own mother.

## Where does epigenetics fit in?

Epigenetics, by bringing into the foreground the relationship between the environment in which a child develops (including the uterus) and the way that their genes are expressed, risks increasing the divide between women's and men's perceived responsibilities for their children. As women are children's prenatal environment, epigenetics may be – and has been – seen as providing further ammunition to extend maternal responsibilities for children to before birth and even before conception. [Richardson et al \(2014\)](#) have warned that careless reporting of epigenetic influences may lead to harm to women, as they may be blamed for epigenetic effects that occur *in utero*. Likewise, [Jungst et al \(2014\)](#) have warned about the leap from studying pregnancy in mice to making claims about what expectant mothers should do.

These risks in the translation of epigenetics findings into moral and legal terms, with a focus on mothers' responsibilities, have been called

‘epi-eugenics’ (Wastell and White, 2017). Wastell and White also highlight how epigenetics may be used to expand parental, and especially maternal, responsibilities. Scientific results based on, for example, animal studies, have been translated into policies aimed at parents who are seen as underperforming with regard to their parental responsibilities: just as a stressed mother rat will neglect or hurt her pups, a stressed human mother may also hurt her children. By individualizing the causes of the distress to the pups (and babies), mothers are held responsible for conditions that may be beyond their control, while at the same time freeing policy makers themselves (and researchers who choose to subject animals to stress)– from problematizing their own contribution. Instead of unravelling the interconnectedness between structural problems and effects on parents and children, epigenetics thus ‘opens new arenas for maternal responsabilisation’ (Wastell and White, 2017, p 184).

By calling into question the boundaries between biology and the environment, epigenetics also confounds the distinction between biological and social parenthood. If the environment in which a child is raised influences their gene expression, in a way that is inheritable, then the environment is also a genetic contributor to the child. If contributing genetically to a child makes one a parent, then the environment in which a child is raised is also a parent of the child. Calling an environment a parent may seem counter-intuitive and perhaps incompatible with what we tend to mean when we say ‘parent’: especially if what we are looking for is a way of ascribing responsibility for children, we may specifically seek an identifiable moral agent, which a child’s environment as such is perhaps not. Going back to the distinction between procreative and parental responsibility as a way to capture various types of responsibilities for children, one way to make sense of epigenetic input into a child’s life may be to call it something like ‘responsibility for shaping’. Epigenetic contributions may not be parental, and they may not be procreative, but they may be significant. Furthermore, the conditions within which children are raised are often shaped by other forces, which may themselves be determined by individual or collective agents.

We have seen in the context of mitochondrial transfer both the lure of the ‘three-parent baby’ discourse, and the explaining away of the donor as simply providing a little help where needed by the (only!) two prospective parents. Mitochondrial transfer involves use of the part of an egg containing mitochondrial DNA to replace the faulty mitochondrial DNA of the prospective mother. Because the nuclear DNA is that of the prospective mother, the argument goes, the mitochondrial DNA donor’s contribution is not the kind that grants biological parent status (Sample, 2015). At the same time, the procedure has frequently been reported in the media as ‘three-parent reproduction’, and the children conceived in this way have been described as ‘three-parent babies’ (Hamzelou, 2016; Macrae, 2016).



However, as Anna Smajdor and I pointed out elsewhere, this suggests that genetic parenthood is a matter of degree (Cutas and Smajdor, 2018): the contribution of the egg donor in mitochondrial transfer is not enough to count as biological parenthood.

In a similar manner, one may also object to the environment or the fetus counting as a genetic contributor – or genetic parent – on the basis of degree. The argument could go like this. The environment in which a child is raised may well have an impact on their gene expression in a way that is inheritable. However, the child is essentially the same child that they would have been were they raised in another environment. They would just be weaker or stronger, taller or shorter: different predispositions would be stimulated or actualized in the various scenarios. As in the case of mitochondrial transfer, this is just a matter of degree, and does not change the essence of who the child really is (see also [Chapter 4](#)).

However, whether I have a predisposition towards obesity or am very anxious or suffer from mitochondrial disease are not marginal, negligible properties. They are very much an integral and salient part of who I am, and will have a significant impact on how I am perceived, how I navigate the world, and how much of my potential I can realize. Likewise, if it is true that fetal DNA finds its way into the gestating woman's brain, then the fetus is a genetic contributor to who she is, even if only to a very small degree. That fetal DNA may not even do anything, but it is a part of her.

## Conclusion

The capacity to remove eggs from one woman's body, fertilize them and transfer them into another woman's uterus has split biological motherhood into two: genetic and gestational. Research into epigenetics indicates that the gestational mother not only helps nourish and develop the fetus in her body, but also contributes to their gene expression. In that sense, she also becomes a genetic mother: she may not transmit genes to the fetus, but she contributes to how the child's genes behave. In the same way, a rearing parent becomes a biological – and genetic – parent by also contributing to the child's gene expression. Gene expression determines a child's identity (for more on gene expression and identity, see [Chapter 4](#)).

If contributing biologically to a child's identity is parenthood, and raising a child contributes to their gene expression in significant ways that are inheritable – which means contributing biologically – then raising a child is (one kind of) biological parenthood. If it is not parenthood, it is in any case biological contribution. Whether or not I develop a life-changing disease is important to who I become. This risk depends partly on whose genetic material has made me, but may also depend on the environment that the people who made me lived in, what experiences they have had,

or on what environment and what experiences I have had. Responsibility for detrimental circumstances may pertain to one's biological parents or the societies they lived in or political decisions made by others. In this sense, knowledge of epigenetics not only extends spheres of influence, but also extends the scope of collective responsibility for children's wellbeing. It thus brings closer together or altogether blurs the margins between parental, non-parental, primary, secondary, individual and collective responsibilities for children.

While epigenetics may be viewed as a basis for extending individual responsibility for children, it also reveals ways in which we are more interconnected with the world that we live in and with each other than we might like to believe. Epigenetics blurs the boundaries between biological and social parenthood. It extends but also dilutes individual moral responsibilities for children by increasing the scope of collective moral responsibility for them. In so doing, it challenges the focus on atomized individual blame and on the capacity to individually prevent or address harm to children.

Insofar as the people who raise a child determine the environment around that child, they are also biological contributors to the child. Insofar as the conditions in which a child is raised are determined by other factors, such as societal inequalities that condemn some people to living in conditions that make adequate development unlikely or difficult, then such inequalities – and the forces that cause them – are morally problematic, just as a parent's failure to safeguard their child's wellbeing is problematic. As these forces are systemic, solutions are also systemic: we cannot fix systemic problems by castigating individual parents whose choice of world in which to conceive and bring up a child is limited. In short, human reproduction and childrearing really do 'take a village'.

## Notes

- <sup>1</sup> This section of the chapter is a further development of a part of Cutas (2021).
- <sup>2</sup> There have been cases, in the Western world, in which grandparents have obtained visitation rights of their grandchildren, regardless – and despite – the wishes of parents (Henderson, 2005).
- <sup>3</sup> Mitochondrial transfer involves the removal of an egg's nucleus which is then placed into another egg. The typical reason for this procedure is the presence of mitochondrial disease: by removing the outer shell of the egg, the risk of the baby being born with mitochondrial disease is removed. The baby resulting from that 'new' egg will inherit the mitochondrial DNA of the egg donor.

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