

Genetic Determinism and *Place*

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In this article, we review genetic determinism and highlight how our earlier research on the philosophy of place can contribute to a better understanding of genomics and ongoing debates about genetic modification. We show how place can undermine any philosophy of genetic determinism. By using our philosophy of place, our investigation contributes to a call for a turn for humanity toward a “collective being-at-home-in-the-world”, instead of being estranged from place which genetic determinism actively promotes. We also utilise cinema studies research of the film GATTACA to conceptualise how place and genetic determinism contrast. Our examination is intended to contribute to ongoing discussions about genetic determinism as they play out in the media, in education and influence discrimination. Fundamentally, we show why scholars in this area should consider place alongside genetic determinism in their future investigations.

Keywords: *Genetic Determinism, Psychoanalysis, Ethics, Place.*

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Introduction

Throughout this article, we will continue our earlier work (Gildersleeve, Crowden, 2018) to demonstrate that insights from *place* provides deeper and more critical analysis of the philosophy of genetic determinism. We introduce genetic determinism here by noting that

“There is much evidence now, in a variety of domains such as sexual orientation, criminality, mental illness, obesity, gender, race, and ethnicity, of causal relationships between genetic attributions as explanations of group differences and perceptions, attitudes, and behaviors” (Dar-Nimrod and Heine, 2011, p. 813).

However, these findings can lead to the belief that “the gene becomes endowed with an almost mystical ability to shape individual and group characteristics, with sociocultural and environmental elements largely being ignored” (Ibid) (including *place*). As a result, there:

“is concern that health communication about genomics will increase public beliefs that genes [directly] determine health (Harris, Weiner, & Parrott, 2005), a phenomenon referred to as genetic determinism. A growing body of literature from various disciplines has debated the social and ethical meanings of genetic determinism, raising questions about how genes define the essence of people’s attributes (Biesecker, 1998; Finkler, 2000; Keller, 2005)” (Parrott, Kahl, Ndiaye, Traeder, 2012, p. 763).

Genetic determinism is a problematic philosophy because it “reduces the self to a molecular entity, equating human beings, in all their social, historical, and moral complexity, with their genes” (Nelkin, Lindee, 2004, p. 2). When this occurs, *place* is foreclosed and this leads to a psychopathological complex being formed (Gildersleeve, 2016). As we have argued elsewhere, the aims of both Jungian and Lacanian psychoanalysis are informed by a restoration of *place*. Essentially, what we argue is that the foreclosure of *place* creates the obstructiveness of a complex experience of ‘not-being-at-home-in-the-world’ (Gildersleeve, 2017, p. 2). Jungian and Lacanian psychoanalysis aims to change this so the analysand can “‘return’ to place-as a homecoming” (Malpas, 2012, p. 19). Psychoanalysis allows a broadening of an analysand’s horizon to *place* in this way because *place* is “a structure that resists any reductive analysis” (Ibid, p. 4). Unfortunately, genetic determinism’s distancing from *place* is in opposition to these aims of psychoanalysis. When *place* is not acknowledged individual mental health is potentially challenged. Thus, genetic determinism will potentially contribute to mental illness through the formation of complexes (Gildersleeve, 2017; 2018).

The *Human Genome Project* has been described as the search for the “essence of life” (Coyne, 1995. p. 80), the ‘Holy Grail’ that would enable the understand-

ing of humanity” however this “may lead people to conceive of genes as playing a deterministic role” (Dar-Nimrod, Heine, 2011, p. 812). This is psychologically dangerous because “people are influenced by scientific arguments regarding the role of genes in their lives”, more specifically “people’s understanding of genes also influences the ways that they live their lives” (Ibid, p. 800). In other words, belief in genetic determinism alienates an individual from discovering their *place* in the world and history because it “may lead people to view outcomes as immutable and determined. That is, an outcome is perceived to unfold according to some fixed set of underlying genetic processes that people assume is largely independent of environmental influence and beyond individuals’ control” (Ibid, p. 802). This is in unmistakable contrast to our philosophy of *place*, which is “a structure that resists any reductive analysis”. Genetic determinism is blind to the reality that the effect of genes is “constituted through an essential mutuality of relation at every level” (Malpas, 2012, p. 4). In other words, the effect that genes have on an individual is determined “in the way in which the multiple elements of place are gathered together in their mutual relatedness to one another” (Ibid, p. 18) and therefore resists the reductionism to genes of genetic determinism¹. The outcome of a gene on an individual’s whole life is not determined by genes alone but instead involves an

“essential gathering of elements in a mutual belonging together in which they come to presence that Heidegger also describes as the *Ereignis* — an event that is to be understood not as purely temporal, but as the temporalizing of space and the spatializing of time in the single gatheredness of place” (Ibid).

When *place* is hidden and forgotten, genetic determinism “leads people to view genetically influenced outcomes as inescapable and predestined. If the genes are present, the outcome is expected” (Dar-Nimrod, Heine, 2011, p. 802). This is problematic because this belief signals, “the ending of history” which “is to be found in the nihilism of the almost complete forgetting of being that is also a forgetting of place” (Malpas, 2012, p. 35). In this article, we highlight more precisely, why the philosophy of genetic determinism is so dangerous because it is psychologically pathological which leads to formations of complexes as an experience of not-being-at-home-in-the-world (Gildersleeve, 2016b). Later

¹ Here we should clarify one possible confusion in our paper. For example, we agree that the sex (male or female) of an individual is determined through genes and our article does not disagree with that. Instead we wish to illustrate that even though sex is determined by genes it does not mean this genetic determinism will determine the destiny or life of that individual as a whole. Yes, genes can determine one element or characteristic of an individual (being male or female) but this does not completely determine who that person will become or the life experiences they will encounter. For example, the historical moment in time and geographical location that this individual finds themselves and the other interconnecting elements in the world around them will determine their *place* in the world and the person they will become. This is our non-reductive view on *place* which emphasizes a multiplicity of elements which are gathered and have a mutual relatedness or reciprocal determination (Gildersleeve, Crowden, 2018, p. 79) to allow greater differentiation in contrast to reducing an individual exclusively to their genes.

in this paper, we make use of the film GATTACA for elucidating this. We also highlight that arguments that criticize genetic modification based on genetic determinism are fallible when *place* is brought into the picture.

Genetic Determinism, Place and Human Character

The forgetting of *place* can be described as “the nihilism of modernity” (Malpas, 2012, p. 98) and this is how genetic determinism adversely affects how people “understand other people as well as themselves” (Dar-Nimrod, Heine, 2011, p. 803). Genetic determinism endorses “a denial of the very topos in which thinking itself comes to pass” (Malpas, 2012, p. 98). When this occurs, *place* will affect (experienced through the obstructiveness of a complex) an individual who denies or covers their *place* in the world and history with genetic determinism, which “is the belief that human behavior, personality, and physical appearance are determined exclusively by a person’s genetic makeup” (Kirby, 2000, p. 197). In contrast, our non-reductive philosophy of *place* clashes with this because “Genetic determinism is a reductionist ideology in that it seeks to explain a complex whole (a human being) in terms of its component parts (individual genes)” (Ibid).

Supporters of genetic determinism believe “human lives and actions are inevitable consequences of the biochemical properties of the cells that make up the individual; and these characteristics are in turn uniquely determined by the constituents of the genes possessed by each individual” (Ibid). Because this belief ignores *place* (genes interacting and determined by Others see Gildersleeve, Crowden, 2018) it leads an individual to experience an obstructive complex (Gildersleeve, 2016b, p. 90) indicative of “Homelessness (...) consists in the abandonment of beings by being. Homelessness is the symptom of oblivion of being” (Malpas, 2012, p. 154). *Place* is not considered in this belief because “Genetic determinism is the impulse to treat DNA as destiny, discounting the possibility of deviating from one’s genetic predisposition” (Rothenberg, Wang, 2006, p. 356) and the influence of Others. Condit comments on Rothenberg and Wang by stating, “the idea that genes constitute a closed destiny arises from what they describe as an ‘overemphasis’ on genes” (Condit, 2011, p. 620). This overemphasis of genes puts *place* into darkness and this is an ontological problem because “By attributing a trait entirely to genetic factors, a reductive and determinist view of behavioural genetics research can also shift blame away from environmental factors created by society”. Furthermore, this shifts “blame for the behavior away from both individual ‘free will’ and the environment created by the family, community, and society” (Rothenberg and Wang, 2006, p. 359). Genetic determinism assumes “that ‘genes’ signaled belief in a closed future” and “‘genes’ had such a powerful influence that its mere presence

necessarily swamped any consideration of other causal influences” (Condit, 2011, p. 620). As a result, genetic determinism takes part in the philosophical “tradition as having largely overlooked the ‘situatedness’” of *place*. In contrast, the philosophy of *place* combined with Jungian and Lacanian psychoanalysis (Gildersleeve, Crowden, 2018) offer an individual the opportunity to “find their unity not in any single preexisting element [e.g. genes] in that place from which the unity of the whole derives, but rather in the way in which the multiple elements of the place are gathered together in their mutual relatedness to one another” (Malpas, 2012, p. 18).

Our philosophy of *place* (combined with Jung and Lacan) opposes the idea that “genes invariably determine characters, so that the outcomes are just a little, or not at all, affected by changes in the environment or by the different environments in which individuals live” (Jamieson, Radick, 2017, p. 1265). We believe this because “any place encompasses other places within it while also being encompassed by other places in its turn” (Malpas, 2012, p. 49) and this is not recognised when an individual is reduced to their genes. An important reason why this is problematic is that it can lead to ‘genetic optimism’, which is the belief “that increased understanding of genes, and greater ability to manipulate them, will be a ‘super solution’, especially in relation to human health and medical developments” (Jamieson, Radick, 2017, p. 1266). This optimism is misguided because it overlooks the importance of factors such as *place* and without this recognition; an individual will continue to experience mental illness through obstructive complexes (Gildersleeve, Crowden, 2018). Scott Gilbert (2002) highlights the prevalence and absurdity of this problem from supporters of genetic determinism in “current popularizers of biology, such as Richard Dawkins (1985), who writes of the genome as the book of life” and “Walter Gilbert (1990) envisions each of us owning a CD that we can point to and say ‘Here is a human being; it’s me’” (Gilbert, 2002, p. 123). Gilbert also brings attention to “Paglia (1992) declaring that DNA is the core of her being, ‘the hard nugget of the self’, a genetic gift (...) Biology is our hidden fate” (Ibid). Finally, there is “James Watson and others of the Human Genome project who claim that understanding the genome will be to find out who we are and to finally ‘know ourselves’” (Ibid). All of these opinions are misguided when contrasted to the philosophy of *place* because instead of

“presenting human beings as deterministically constrained, such a conception opens up a view of the human as enmeshed in an essentially reciprocal relation with the world in which it is also situated. The human thus cannot be assumed in advance, nor can it be taken to arise out of only one set of structures or elements alone” (Malpas, 2012, p. 156).

The ideology of genetic determinism contributes to mental illness by claiming, “we are what our genomes tell us to be” and “once we know the sequence of the human genome, we will now know how to cure such diseases as homeless-

ness (Koshland, 1989) and homosexuality (Watson, 1997)” (Gilbert, 2002, p. 123). This erroneous belief in genetic determinism is disastrous as it can “inhibit attempts to engage in preventive health behaviours by engendering a sense of fatalism and a belief that such behaviours will be ineffective” (Senior, Marteau, Weinman, 2000, p. 1086). For example, genetic determinism may prevent an individual from obtaining mental health and understanding their “reciprocal relation with the world” (Malpas, 2012, p. 156) to achieve their homecoming to their *place* in the world and history, which “is one that is constantly before us, in which we are always situated, and yet from which we often seem estranged” (Ibid, p. 14). This is supported by a variety of research. For example, in 2017, Carver et.al state,

“genetic determinism is thought to have a negative impact on people’s understanding of health and disease. Genetic deterministic views can, for example, lead people to devalue the role of environmental or experiential factors in a number of traits such as mental illness, cancer, obesity, diabetes, which in turn can hamper efforts to prevent diseases” (2017, p. 5).

Furthermore, the aim of Beauchamp et.al (2011) was “to examine the effect of deterministic media reports, linking genetics to inactivity, in relation to inactive people’s social cognitions concerning physical activity involvement” (Ibid, p. 8). These authors found a study that “provides insight into the potential deleterious effects of genetic deterministic reports” (Ibid, p. 9). In this cited study, “women were primed with either a genetic or an experiential account (i.e., a nature-versus-nurture explanation) for gender differences in mathematics ability. Specifically, when women were provided with a bogus report that innate genetic differences exist between males and females in terms of mathematics ability (i.e., women are born to be worse at mathematics), they subsequently performed worse on a mathematics test than when women were provided with an alternative experiential report” (Ibid). These results “raise a cautionary flag regarding the way in which genetics research is presented in the media” (Ibid, p. 8). More precisely in relation to *place*, genetic determinism can prevent or discourage “a return to our own experience of being, and one might say, our own experience of ourselves” (Malpas, 2012, p. 173). *Place* can remain unconscious or ‘misrecognised’ (Gildersleeve, 2016a, p.8) if an individual does not follow the ethics of psychoanalysis to act in “conformity with the desire that is in you” (Lacan cited in Gildersleeve, 2017, p. 4) to unify their desire with the desire of the Other through Jung’s transcendent function (Gildersleeve, 2018, p. 27). The ambitions of Jungian and Lacanian psychoanalysis are to achieve this as “a turning or a coming back to place, or to a place, in a way that also brings that place itself into view. It is an occurrence that is mirrored in Heidegger’s own image of the “clearing” (*Lichtung*) that allows the emergence of things into presence” (Malpas, 2012, p. 19). Malpas states, this

“movement back to place-back to that which otherwise remains unnoticed and unremarked (as place itself often remains in the background of our activities)-can also be understood as a movement of recollection, of remembering again, and Heidegger draws directly on this idea alongside that of return or homecoming” (Ibid).

This homecoming is in contrast to ‘not-being-at-home’, which occurs when an individual leaves their *place* undiscovered because their genetic determinism beliefs prevent them from discovering their *place* (see Gildersleeve 2016a,b; 2017).

Adding to this, Carver et.al (2017, p. 4) argue genetic determinism “ignores the influence of environmental and epigenetic factors” and this is important because “genes show different expressivity and penetrance depending on the influence of environmental factor”. In other words, genetic determinism ignores the “multiplicity of elements” (Malpas, 1999a, p. 133) of *place*, which determines the fate of an individual’s life, which are not exclusively genes. Our research is important to combat these misguided dogmas because “genetic deterministic beliefs still prevail to a great extent, according to the literature” and “Previous studies examining public knowledge of genetics generally indicate that such knowledge is low” (Carver et al., 2017, p. 4). Finally, the public has difficulty with “the notion that genetic and environmental factors interact” (Ibid). This is something our philosophy of *place* does not ignore because we believe “it is a mistake to look for simple, reductive accounts-whether we are exploring a concept, or problem, or the meaning of a term, the point is always to look to a larger field of relations in which the matter at issue can be placed” (Malpas, 2008, p. 35). Genes are the basic functional units of our heredity. However, they do not determine our character². Truly ‘knowing oneself’ is not a mere function of the human genome. Rather, it is achieved through the ‘remembering of *place*’. Thus, place is, and will continue to be, central to virtuous character and human flourishing.

Genetic Determinism and the Media

The philosophy of *place* is urgently needed to re-orientate common opinion because “Genetics-related research often receives much attention from the media (Conrad, 2002; Nelkin & Lindee, 1995)” (Dar-Nimrod, Heine, 2011, p. 811). Dar-Nimrod and Heine argue, this “research is simplified to the point that many readers or listeners may get a misunderstanding of the phenomenon” (Ibid), which we contend is because *place* is not included in the conception of genetics research. Conrad also “noted a number of biases in the ways genetic

² Of course genes play a role or factor in determining our character but our character is not solely determined by genes. The effect of genes and character is ultimately determined by *place*.

findings are communicated that make the genes appear to play a more central and deterministic role than the data actually suggest” (Ibid). Dar-Nimrod and Heine claim, “such distortions in the way genetic research is communicated may have a variety of negative consequences” (Ibid, p. 813). For example, when an individual only understands their self/existence through their genetic make-up, they are unable to understand the “interconnected and mutually defining” (Malpas, 1999a, p. 133) relationship between their genes and their *place* in the world and history. Likewise, “people who gain their knowledge of genetics largely through the media are likely to conceive of genetic influences in overly deterministic, immutable, and ultimately erroneous ways” (Dar-Nimrod, Heine, 2011, p. 812). This is mistaken because the effect of genetic makeup

“is never a matter simply of the coming to presence of a single being-as if presence was something that could attach to a single self-sufficient entity. The presencing or disclosedness of a being is always a matter of its coming to presence in relation to other beings” (Malpas, 2008, p. 14).

This shows why it is problematic that “public discourse on genetics is plagued by genetic fatalism in such a way that any association between genes and behavior is seen to imply predetermined, immutable behaviour” (Dar-Nimrod, Heine, 2011, p. 803). Likewise, Carver et al. (2017, p. 4) show that “Studies of mass media portrayals of genetics also generally indicate a predominant discourse of determinism” and “public discourse on genetics is plagued by genetic determinism in such a way that human beings equate ‘all their social, historical, and moral complexity, with their genes’”. Clearly, genetic determinism is not a minor issue and this emphasizes the importance of correcting this by recognising that the effect of genes are determined through *place* which is “a gathering of elements that are themselves mutually defined only through the way in which they are gathered together within the place they also constitute” (Malpas, 2008, p. 29).

Genetic determinism and the philosophy of *place* are mutually exclusive and *place* is ‘forgotten’ or unconscious if the public becomes “more accepting of the genetic determinist ideology” (Kirby, 2000, p. 197). This acceptance is evident when “popular images convey a striking picture of the gene as powerful, deterministic, and central to an understanding of both everyday behavior and the ‘secret of life’” (Ibid, p. 198). This acceptance of genetic determinism and forgetting of *place* is destructive because it leads to “strengthened fatalistic cognitions, a reduced belief in the importance of the environment in shaping human behavior, and a decrease in perceived individual choice” (Dar-Nimrod, Heine, 2001, p. 814). This is important because it highlights that an individual will only be ‘at home in the world’ (without complexes see Gildersleeve, Crowden, 2018) if they do not reduce themselves to their genes and by finding their *place* in the world which is interconnected with others. This is not helped when examples of genetic determinism in the media are highly prevalent:

“In 2002, for example, news headlines claimed, ‘Quest for *Alcohol Gene* Sets Monkeys on Binge’ (Harrison, 2002). That same year, news reported, ‘*Fear Gene* Could Unlock Mental Illness’ (BBC News, 2002). In 2003, CBS News reported a story about ‘the heart attack gene’ isolated in one family among generations of members who have experienced heart disease; the report asserted that, ‘the gene doesn’t merely increase their risk of a heart attack. It’s an absolute guarantee’ (Leung, 2003). In 2007, a New York Times article was titled, ‘Scientists Identify 7 New Diabetes Genes’ (Wade, 2007)” (Parrott, Kahl, Ndiaye, Traeder, 2012, p. 764).

This forgetting of *place* leads to inauthentic and misleading reporting in the media because “there are no ‘disease genes,’ but rather genes that increase risk for disease” (Ibid). A more authentic and *Real* (Gildersleeve, 2016a; 2017) report would “state that genes linked to such chronic conditions as heart disease do not set an absolute life course in determining health” (Parrott, Kahl, Ndiaye, Traeder, 2012, p. 775) because we exist in a world where “we find ourselves along with other persons and things” (Malpas, 2008, p. 221). When this is ignored, an individual’s belief in genetic determinism may be “directly related to fatalism (Shen et al., 2009), which contributes to failure to seek health care and perceptions of lack of control over health” (Ibid). This means *place* needs to be promoted, endorsed and

“genetic researchers should emphasize the importance of avoiding the use of shorthand expressions such as ‘a heart attack gene’ instead of ‘Gene defect explains high blood pressure’ (BBC News, 2003) and ‘Single gene link to heart health’ (BBC News, 2004)” (Smerecnik, 2010, p. 386).

When the media ignores *place* and presents genetics to the public in this way, it brings “several authors to argue that media coverage of genetics may lead to beliefs of genetic determinism (De Vries, Mesters, Van de Steeg & Honing, 2005; Katz Rothman, 1998)” (Ibid). Dar-Nimrod and Heine summarise this by stating, “media coverage of genetics may thus have adverse effects on public health” (e.g. the formation of a complex) when headlines such as “DNA is the ‘secret of life’” (Dar-Nimrod, Heine, 2011, p. 811) are flaunted to the public. The fantasy of genetic determinism grows greater when “In television shows, in advertisements, in documentaries, and even in novels, we are told that DNA makes us what we are both physically, mentally, and behaviorally (see Keller, 1992; Nelkin and Lindee, 1995)” (Gilbert, 2002, p. 123). This reporting is counterproductive because an individual will only be psychologically ‘at home in the world’ (Gildersleeve, Crowden, 2018) if they are able to discover their *place*, which is mutually, defined in relation to others. Unfortunately, “Genetic determinism is becoming an assumption of modern life” (Gilbert, 2002, p. 123). Our philosophy of *place* is an important correction to this.

Genetic Determinism and Education

In this next section we ask,

“Is there a way that these biases might be reduced? Can people be led to appreciate how genetic accounts of an outcome do not necessarily mean that the outcome is immutable, homogeneous, and natural or has a specific etiology?” (Dar-Nimrod, Heine, 2011, p. 802)³.

Dar-Nimrod and Heine say, “suggestions for interventions are speculative, and researchers would contribute to the field by exploring some of them” (Ibid, p. 813); we take up this challenge here. This is important because as Carver et al. (2017, p. 2) highlight

“studies within genetics education and public understanding of genetics persistently show that the public and, more specifically students, have rather low knowledge of genetics. Genetic deterministic views about the nature of genes, behavior and biological traits have been found among students, teachers, textbooks, and the public”.

Dar-Nimrod and Heine (2011, p. 813) suggest, “One strategy to undermine genetic determinism would be to call people’s attention to the interactive relationships between genes and the environment”. An example of achieving this is to integrate *place* into discussion of genetics. This type of education could reduce discrimination; for example

“Walker and Read (2002) found that people had more positive evaluations of schizophrenia when they encountered a gene–environment interaction explanation than when they encountered an exclusively genetic account” (Ibid).

Dar-Nimrod and Heine also argue

“People rarely appreciate that the expressions of genes are probabilistic and governed by experiences and interactions with other genes, nor do they generally consider how genes can influence the ways we interact with and are thus shaped by our environments” (Ibid).

This shows the errors of education on genetics when it excludes an individual’s relationship to others by focusing solely on the genetic makeup of the individual as “separate and autonomous entities” (Malpas, 2011, p.49). New forms of genetics education need to incorporate a recognition “that we cannot understand ourselves independently of the places in which our lives unfold even though those places may be complex and multiple” (Malpas, 2014a, p. 22).

Incorporating *place* into genetics education is supported by evidence “that increased education in general is sometimes associated with a reduction in

³ Here it is important to note that we are not saying genetic heritage is passive in a sense that is not present at all. We are giving the benefit to say that the gene will express itself but the effect that gene has on a person’s life is determined by *place* not the genes alone.

belief in genetic determinism (Singer et al., 2007)” (Dar-Nimrod, Heine, 2011, p. 804). We argue that education programs that incorporate the philosophy of *place* into discussions of genes can remove the beliefs and fantasies of genetic determinism. We propose including a philosophy of *place* in “the manner in which genetics is taught in the classroom (e.g., Dougherty, 2009) may go a long way toward a solution” (Ibid, p. 813). This is vital because “Genetics education has, for example, been suspected of indoctrinating strong genetic determinism” (Avelo, Uitto, 2015, p. 139). This is supported by a study that investigated “how the current curriculum manifests in Finnish biology textbooks” (Ibid). These authors found the “textbooks expressed sometimes even strong genetic determinism” where “the parlance of genes ‘determining’ a trait and the genes having a superior role over environment were common throughout the books” (Ibid, p. 148). In response to this, the authors “argue that genetics education needs to take more into account than environmental effects” (Ibid, p. 139). This aligns perfectly to our philosophy of *place*, which is based on “identity through differentiation” (Malpas, 2016, p.7). In other words, the identity of genes is determined (negatively e.g. what it is not) through differences to the environment and to other individuals. This is how to understand ‘the whole organism’ outside of reductive and solipsistic genetic determinism. In other words, “while one can take the thing at issue at a certain ‘instant’ and then analyze or dissect it into its apparently separate elements, treating each as if it had an identity of its own, any such analysis is always somewhat artificial” (Malpas, 2008, p. 59). This type of education is required because “Genetic determinism, making genes central to biology, is biased and misguided. The crucial unit must be the whole organism” (Midgley, 1999, p. 900). One way to achieve this is through *place* which allows “re-conceptualizing notions like ‘genes’ and ‘nature’ [which] will probably be one of the most effective ways to help students and the general public [to] abandon genetic determinism” (Moore, 2008, p. 344). Evidence that this is required is found where “biologists continue to write as if developmental processes can be genetically determined (e.g., Gehring, 1998)” (Ibid, p. 332) coupled with “belief that genes can determine the form of some of our characteristics remains widely held by journalists, politicians, students, and the general public—and surprisingly, by many social scientists” (Ibid, p. 333). In contrast, our philosophy of *place* argues that genes need to be understood “within a dense web of relations – through those relations it gives shape and focus to other things, but in doing so it also gives shape and focus to itself” (Malpas, 2016, p. 8). Moore suggests

“genetic determinism might retain some currency because of the apparent elegance of its simplicity; the emerging understanding of how genes interact with nongenetic factors during development is extremely complex, and so perhaps less appealing to these individuals” (Moore, 2008, p. 334).

He highlights

“although many philosophers and scientists consider simpler theories to be preferable to more complex theories, all other things being equal (Sober, 1981), a truly complex reality requires a complex theory, even if such a theory might initially be less appealing to those exposed to it” (Ibid, p. 343).

Moore adds, “Unfortunately, it is not yet clear how we might best attempt to convey the essential interdependence of nature and nurture to students and the general public” (Ibid) but we contend that our philosophy of *place* can convey this interdependence. For example, the effect of genes is determined through the environment, others and “through the interrelating of the elements that already belong to the situation” (Malpas, 2008, p. 59). In other words, the effect of genes on an individual is not determined by genes alone but through “the reciprocal determination of elements” (Ibid) (genes, others, environment). The effect of genes are determined through

“a structure that is constituted through the mutual interplay of multiple elements, a structure that encompasses the entities and elements that appear within it rather than underlying them, a structure to which belongs a unity that is given only in and through the mutual relatedness of the elements that make it up” (Malpas, 2012, p. 40).

In the article, “Hybrid Deterministic Views About Genes in Biology Textbooks: A Key Problem in Genetics Teaching” (dos Santos, Joaquim, El-Hani, 2012), the authors “analyzed 18 textbooks using categorical content analysis”. They found the textbooks “reinforce genetic deterministic discourses and may lead students to serious misunderstandings about the nature of genes and their role in living systems, with consequences to future learning about genetics” (Ibid, p. 572). This is supported by Carver et al. (2017, p. 5) who found

“Studies on how genetics is taught in schools generally indicate that the predominant mode of genetics instruction, as well as the content of genetics textbooks, prime students to think deterministically”.

The significance of our philosophy of *place* to correct this is also noted when

“It has been also shown that when students learn or talk about molecular genetics they tend to draw on more deterministic Mendelian explanations. In particular, according to Dougherty, ‘many students view phenotypes through the lens of Mendelian inheritance and fail to appreciate that most human traits are the product of polygenic expression modulated by the environment’” (Ibid).

If the philosophy of *place* is not included in discussion of genetics “bioethicists might inadvertently be promoting genetic determinism: the idea that genes alone determine human traits and behaviours” (de Melo-Martin, 2004, p. 526). As a result,

“because of the problematic implications that the ideology of genetic determinism might have for individuals’ wellbeing and for our public policies, bioethicists should be careful to present these issues in ways that do not promote ques-

tionable ideas about the causal role of genes in human diseases and behaviours” (Ibid).

An individual’s wellbeing is affected by genetic determinism because the obstructiveness of a complex is experienced when *place* is foreclosed from symbolic reality (Gildersleeve, 2016a,b; 2017). In contrast, an individual’s authentic identity and *place* in the world “is given only in and through the ongoing and reciprocal determination of the elements of which it is constituted” (Malpas, 2008, p. 60) and when this is ignored through a belief in genetic determinism, the individual misrecognises their *place* in the world, which results in the experience ‘not-being-at-home-in-the-world’. An example of this psychopathological fantasy of genetic determinism comes from “the flood of arguments against human cloning on grounds of a possible loss of a sense of individuality or unique identity promote the incorrect belief that our genes determine human individuality or identity” (de Melo-Martin, 2004, p. 526). However, this argument is misguided because individuality and unique identity are not only determined by genes but also through *place*, which is “a gathered unity in which things find themselves brought together with one another while they are also disclosed in their difference” (Malpas, 2008, p.264). Furthermore,

“many of the debates about the rightness or wrongness of genetic enhancement, erroneously suggest that tinkering with the human genome is sufficient to ‘enhance’ our memory, intelligence, disease resistance, or beauty” (de Melo-Martin, 2004, p. 526).

However, these types of arguments are unsound because genes alone do not determine these characteristics, *place* must also be considered because the effect of genes are “defined not by their positive content but negatively by their relations with the other terms of the system. Their most precise characteristic is in being what the others are not” (Saussure, 1959, p. 117). This then shows a mistake when “bioethicists present genetic tests as being more predictive of human diseases than what is actually reasonable” (de Melo-Martin, 2004, p. 526). In contrast, our philosophy of *place* rejects “the idea that genes alone play a role in the development of human traits and behaviours” (Ibid). The ideas we provide to this area of study is vital because endorsing genetic determinism

“can contribute to public policies that emphasise genetic interventions rather than preventive measures, lifestyle modifications, or transformations of social structures. If, however, factors other than our genes influence the development of—for example, human diseases—then focusing on genetic interventions alone will be inefficient” (Ibid, p. 527).

When the philosophy of *place* is forgotten,

“the belief that genes determine us might result in people seeing information about their genetic makeup as fate. Thus, although lifestyle changes could improve people’s wellbeing, the motivation to do so might be lacking” (Ibid).

As a result,

“bioethicists should be careful to present these and other similar issues in ways that do not promote problematic ideas about the deterministic role of genes in human development, diseases, and behaviours” (Ibid, p. 529).

Genetic Determinism and Discrimination

Our philosophy of place, which aims to dislodge genetic determinism’s (GD) acceptance, is important because a number of authors argue that GD is linked to discriminating behaviour. For example, Dar-Nimrod and Heine (2011, p.803) say,

“the Belief in Genetic Determinism Scale, which includes items such as ‘The fate of each person lies in his or her genes,’ positively correlates with prejudice, negative racial stereotyping, nationalism, and patriotism (Keller, 2005)”.

Other researchers support this when they write, “Substantial empirical research has now demonstrated that genetic determinism is in fact linked to discriminatory attitudes including prejudice, Social Dominance Orientation, sexism, and racism” (Condit, 2011, p. 618). Furthermore, Kowal and Frederic (2012, p. 3) argue, “the way the media reports on genetic research is likely to increase belief in genetic determinism”. This is also supported

“by several studies that have found significant correlations between the belief in genetic determinism (of human traits and behaviour) and levels of prejudice, including racism. Dambrun et al found group prejudice, including racism, to be mediated by belief in genetic determinism, to the effect that the more people believed in the power of environmental determinants of behaviour and personality, the lower the level of racism” (Ibid).

Furthermore

“belief in genetic determinism was significantly correlated with prejudice, including negative racial stereotyping, the study also found that rendering genetically essentialist information salient (i.e. ‘priming’) clearly increased levels of prejudice and in-group bias” (Ibid, p. 4).

In other words, “people who are especially likely to view groups as sharing a common genetic essence are more likely to espouse stereotypic beliefs about those groups” (Dar-Nimrod, Heine, 2011, p. 803). This shows that belief in genetic determinism and the forgetting of *place* “is a societal problem because it has the potential to foster intolerant attitudes such as racism and prejudice against sexual orientation” (Gericke et al., 2017, p. 1223). However, “knowledge about genetics and the influence of the environment on biological outcomes

might reduce beliefs in genetic determinism” (Ibid, p. 1224). An idea that is entirely congruent with our philosophy of *place*.

GATTACA and Place

The film GATTACA provides a cinematic demonstration that genetic determinism leads to discrimination and mental illness and therefore supports our aims in this paper. In the year 2000, Kirby writes, “GATTACA (1997) presents a unique counter-argument” (p. 198) to genetic determinism. Kirby argues, “GATTACA tries to break out of the black box constructed by genetic scientists who portray a world dominated by genes. GATTACA does not deny the importance of genes, nor does it fault the technology itself; rather, the film warns of the problems that arise if we believe that humans are nothing more than their genes” (Ibid). Kirby gives an excellent outline of the film:

“GATTACA depicts a future world in which parents are encouraged to decide the genetic makeup of their offspring before birth. In this world not everyone has access to the technology, and individuals who have not been genetically enhanced encounter severe discrimination. GATTACA’s narrative focuses on Vincent Freeman, a genetically unenhanced individual, and his interactions with three characters, Eugene, Irene, and Anton, who are genetically enhanced. During the course of the film, Vincent avoids genetic discrimination by passing off Eugene Morrow’s genetic makeup as his own. Because everyone believes that Vincent has Eugene’s genetic profile, he is able to obtain a job at the prestigious Gattaca corporation, which arranges offworld expeditions. While at Gattaca, Vincent develops a romantic relationship with Irene, who would be genetically perfect except for a single flaw, a weak heart-ironically, the same defect suffered by Vincent himself. Early in the film an executive is murdered at Gattaca, and the subsequent investigation is conducted by Vincent’s genetically augmented younger brother, Anton. A stray eyelash provides DNA evidence, making Vincent the prime suspect in the murder. Because the DNA profile from the eyelash shows a genetically imperfect individual, nobody suspects that the eyelash really belongs to the best engineer working at Gattaca. As Irene and Anton begin to realize that Vincent is not genetically perfect, they are forced, along with Eugene, to confront the fact that the genetically unenhanced Vincent is actually a superior human being, able to excel physically and socially despite his built-in ‘flaws’” (Ibid, p. 199).

GATTACA is “an extrapolative science fiction film” (Ibid) that portrays a world dominated by the ideology of genetic determinism and where *place* is foreclosed and undiscovered. Kirby argues, “the filmmakers act as bioethicists, attempting to forecast the consequences of unrestricted human-gene therapy in a society that accepts all the implications of the genetic determinist ideology” (Ibid). He shows that:

“In the Production Notes for GATTACA, co producer Stacey Sher points out that ‘GATTACA is a science fiction thriller about how we might come to live with the scientific powers we are currently discovering...; [it] creates a complete and believable world of the future based on the genetic testing that is becoming a reality today’ (1). Screenwriter/director Andrew Niccol’s construction of GATTACA as a bioethical text focuses on three prominent concerns: 1) genetic discrimination against those who are not enhanced, 2) the cultural implications of predictive genetics (genetic prophecy), and 3) the eradication of ‘undesirable’ traits and human imperfections” (Ibid).

Kirby highlights that in GATTACA,

“Discrimination against the genetically unenhanced presupposes that genetic determinism is the true state of the world and that genetic manipulation actually improves an enhanced individual’s behavior and ability to perform a job; in this case, the genetically enhanced should always perform better than the genetically unenhanced and genetic discrimination is justified” (Ibid, p. 201).

The movie GATTACA is vitally important to this discussion because

“If genetic determinism is not a valid paradigm, then genetic manipulation will not automatically improve an enhanced individual’s behaviour” and “the genetically unenhanced should be able to perform as well as, or better than, genetically-enhanced individuals, and genetic discrimination is not justified” (Ibid, p. 202).

This paves the way to show that the philosophy of *place* is a better predictor of destiny, represented when “the genetically-unenhanced Vincent proves to be more successful than all the genetically-enhanced characters” (Ibid). This is how combining *place* and “GATTACA dismisses the practice of genetic discrimination by rejecting its underlying assumption of genetic determinism” (Ibid).

Our philosophy of *place* denies “that a genetic readout can be used to predict a person’s future: genetic inheritance is equivalent to predestination” (Ibid). Harsanyi and Hutton mistakenly support these claims of genetic prophecy when they argue “that individuals’ genetic readouts are an accurate gauge of their future: ‘Genetics offers answers. For genes can foretell the future’” (Ibid). These authors display ‘genetic optimism’; “it is only a matter of time and technical skill before we understand their language” (Ibid). This is a problem because it ignores that genes interact with *place* and therefore genetic readout is not possible because *place*, which is “an interconnection can never be given all at once, nor in any final or exhaustive fashion (no mapping is ever complete)” (Malpas, 2014b, p. 4). Unfortunately, Harsanyi and Hutton ignore something that our philosophy of *place* does not: “a person ultimately develops this trait or disorder is dependent on complex interactions linking heredity, environment, the individual, and society” (Kirby, 2000, p. 202). Our philosophy of *place* explains and conceptualises why a “genetic readout provides uncertain predictive information about possible futures, not guaranteed outcomes” (Ibid) because

the effect of genes depends on a “repeated tracing out of those connections” (Malpas, 2014b, p. 4) of *place*. Kirby notes the “danger in believing that genetic readouts are infallible is that these predictions will become self-fulfilling prophecies” (Kirby, 2000, p. 202) and this will lead an individual to not discover their authentic *place* in the world and history (resulting in psychological issues) (Gildersleeve, Crowden, 2018). Kirby supports this by referring to the work of sociologist Charlie Davison who argues,

“a person who knows that he or she has a genetic predisposition for heart disease will behave as if certain to develop heart disease, rather than take the chance that the disease may never develop. In an extreme genetic-determinist society (i.e., GATTACA), genetic readouts would no longer serve as tentative predictors of possible futures, but would be viewed as unalterable prophecies” (Ibid, p. 203).

The problems of genetic determinism are clear to see. When an individual is unaware of *place* they do not understand that their genes are “not given independently of other places-for there to be one place is for there to be many places, and so places appear always as part of a larger topographic or topological field” (Malpas, 2014b, p. 8). With *place* included in the picture, it is clear that a genetic readout does not provide ‘unalterable prophecies’ because the effect of genes depends on an individual’s interaction with their *place* which “is essentially unitary, dynamic, and constantly unfolding” (Malpas, 2008, p. 65).

GATTACA represents a world that has forgotten *place*, reflected in the story of Vincent who is “given his life story at the time of his birth based on his genetic readout: ‘My destiny was mapped out before me-all my flaws, predispositions, and susceptibilities’” (Kirby, 2000, p. 203). When *place* is forgotten “Vincent initially accepts this destiny, saying that ‘from an early age I came to think of myself as others thought of me-a chronic in-valid’” (Ibid). However, we argue that the truth of *place* allows Vincent to realise “that his potential is not written in his genes, and he escapes the trap of genetic determinism, becoming, as his name implies, a ‘Freeman’” (Ibid). Therefore, *place* frees the human being from the shackles and ideology of genetic determinism. This is possible because potential is not written exclusively in genes but is determined through *place*, which is “interconnection rather than their reduction, through their interdependence rather than their simplification” (Malpas, 1999b, p. 40). The character Irene also breaks from the brainwashing of genetic determinism “As Uma Thurman, who plays Irene, states, ‘her fate isn’t sealed the way she thinks it is, and the realization transforms her’” (Kirby, 2000, p. 203). A world where genetic determinism is believed and *place* is left undiscovered is disastrous because “the genetically enhanced suffer under a burden, that of perfection” (Ibid). This is actually pathological because perfection is a fantasy and this ideology will only cause an individual to feel not-at-home-in-the-world because imperfection is necessary to discover their authentic and *Real* home

in the world through the Lacanian barred subject \$ (Gildersleeve, 2016; 2017; 2018). Imperfection is where an individual meets their boundaries or limits and this is essential to discover their *place* in the world (Ibid). As a result, genetic determinism may inadvertently prevent this by emphasizing the importance of genetic perfection. In contrast, our philosophy of *place* recognises that “boundary, in the Greek sense, does not block off but, rather, as itself something brought forth, first brings what is present to radiance” and “a boundary is not that at which something stops but (...) that from which something begins its presencing” (Malpas, 2012, p. 101). This boundedness is the structure of the Self or barred subject (which Jungian and Lacanian psychoanalytic treatment aim to uncover) and this is what allows an individual to remove the obstructiveness of their complex to find their *place*, freedom (Gildersleeve, 2017, p. 7-8) and homecoming in the world.

Place implicitly challenges genetic determinism throughout GATTACA. For example, “Vincent’s actions cause Anton to question his innate superiority. When Vincent saves Anton from drowning, Vincent realizes that ‘My brother was not as strong as he believed and I was not as weak’” (Kirby, 2000 p. 204). This example illustrates that the *place* or situation determined Vincent saving Anton from drowning, not only his genes. Genetic determinism is again challenged by *place* because “Throughout the film we are reminded that Eugene has a genetic makeup second to none. He has been engineered to be an Olympic swimmer, yet he has only won a silver medal at the games” (Ibid). Our philosophy of *place* can explain why this is so. One example is that swimming performance is determined by the *place* of Eugene’s genes in relation to the ability of other swimmer’s in the race.

Kirby also notes, “visual motifs express the overriding importance of genetic makeup in GATTACA’s society” (Ibid, p. 205). This example shows *place* (is excluded) has no place in this genetic determinism society. GATTACA further emphasizes the characters are absorbed by genetic determinism instead of *place* when “Blood, skin, hair (including eyelashes), urine, and fingernails are all shown in extreme close-up” (Ibid, p. 206). Kirby explains the “use of such shots in GATTACA is meant to show how GATTACA’s society magnifies the importance of genetic material, the smallest element of a human being” (Ibid). Kirby rightly notes, “these extreme close-ups of body parts and waste matter are extremely alienating, suggesting that human beings are valued less than their cast-off DNA” (Ibid) and highlights the human beings alienation from *place*.

Our philosophy of *place* combined with GATTACA’s critique of genetic determinism is very important. This is evident when examined alongside

“One of the most well-known scientists in the field of human genetics, Dean Hamer, [who] claims in his 1998 book *Living With Our Genes* that everyone’s ‘core personality’ is ‘hardwired into their bodies since birth, a genetic legacy from their parents as surely as the color of their eyes’” (Kirby, 2000, p. 210).

Again, GATTACA and *place* are vital here to combat the genetic determinism of Hamer who

“claims that environmental factors such as ‘rearing, education, or social status’ contribute almost nothing toward determining an individual’s personality. Hamer is not some rogue figure; he is Chief of Gene Structure and Regulation at the National Cancer Institute’s Laboratory of Biochemistry, and he is not alone among biologists in his acceptance of genetic determinism. James Watson, co-discoverer of the structure of DNA and Director of the Cold Spring Harbor Laboratory, has asserted that ‘we used to think our fate was in our stars. Now we know, in large measure, our fate is in our genes’” (Ibid)

Here it is important to note that the acceptance of *place* may be thwarted (as well as achieving mental health) if “the human genetics community has an interest in gaining societal acceptance of genetic determinism, whether that interest be financial, political, or professional (e.g., career advancement)” (Ibid). Genetic determinism may be motivated and *place* fraudulently demotivated through “a need to convince the federal government to maintain funding for human-genetics research, such as the Human Genome Project” and “designed to keep public attention focused on the great potential benefits that are likely to flow from the Human Genome Project” (Ibid).

Finally, Kirby sums up the philosophical significance of GATTACA by stating it “is not only unique among bioethics texts; it is virtually alone among recent popular culture narratives in its rejection of the genetic-determinist ideology” (Ibid, p. 212). Our philosophy of *place* combined with GATTACA does not fault genetic “technology itself, but rather questions societal acceptance of an ideology that holds that humans are nothing more than the sum of their genes (genetic determinism)” (Ibid, p. 215). GATTACA depicts a future where “genetic determinism becomes a closed ‘black box’ once it is taken for granted and accepted as accurate and useful” (Ibid). GATTACA is an important film to consider in debates on genetic determinism combined with our philosophy of *place* “to break open the black box that has been constructed by scientists who portray a world dominated by genes” (Ibid). We hope that when this black box is broken open it will be commonly accepted that genes are not “sufficient to gain a view of the entire region; multiple sightings are required, and every sighting overlaps, to some extent, with some other sighting” (Malpas, 1999b, p. 41). If this black box is not broken, the reality and truth of *place* will continue to haunt supporters of genetic determinism as ‘the return of the repressed’ (Gildersleeve, 2018, p. 12). This is reinforced by Malpas who argues “We may become estranged from place, we may forget or cover over our essential placedness, but these are all forms of concealing, disguising, or denying a relatedness to place that nevertheless perdures” (Malpas, 2012, p. 63). It is important to highlight this because in our reductionist scientific “modernity, our relatedness to place is not obliterated, but is rather covered over, ignored, made invisible” (Ibid).

Genetic Modification and Place

In this penultimate section, we elucidate an important article by Resnik and Vorhaus (2006). They argue,

“popular culture, the media, and politicians are apt to ignore the fact that strong genetic determinism is almost entirely a myth. Journalists continue to speak of ‘genes for obesity,’ ‘genes for alcoholism,’ and ‘cancer genes,’ as if genes exist that, once discovered, will give individuals the ability to simply ‘shut off’ obesity, alcoholism, or cancer with a few simple snips to their genome” (2006, p. 4).

In their article ‘Genetic modification and genetic determinism’, these authors “examine four objections to the genetic modification of human beings: the freedom argument, the giftedness argument, the authenticity argument, and the uniqueness argument” (Ibid, p. 1). Briefly stated, the freedom argument, “claims that genetic modification interferes with the ability of the modified human being to make free choices” (Ibid, p. 5), the giftedness argument states “parents and others supporting genetic modification are accused of desiring to ‘play God’, and of designing children to fulfill their own desires” (Ibid, p. 8). The authenticity argument “claims that the person who benefits from a genetic modification plays no significant role in the development of the desired trait” (Ibid). Finally, the uniqueness argument claims, “cloning would inherently interfere with the individuality of the cloned person and therefore undermine the formation of his or her personal identity” (Ibid, p. 9). Resnik and Vorhaus show

“these arguments against genetic modification assumes a strong version of genetic determinism. Since these strong deterministic assumptions are false, the arguments against genetic modification, which assume and depend upon these assumptions, are therefore unsound” (Ibid, p. 1).

We combine our philosophy of *place* with this work from Resnik and Vorhaus to add further support to dismiss these arguments against genetic modification, which can bring about a “changed conception of both our usual ways of thinking about philosophy, about ourselves, and about our own experience of involvement in the world” (Malpas, 2012, p. 4). As a result, our work on *place* supports the claim that

“Serious discussion of the morality of genetic modification, and the development of sound science policy, should be driven by arguments that address the actual consequences of genetic modification for individuals and society, not by ones propped up by false or misleading biological assumptions” (Resnik, Vorhaus, 2006, p. 1)

(genetic determinism). Our philosophy of *place* shows these arguments against genetic modification fail because they assume genetic determinism and do not consider *place*. In other words, these four arguments against genetic modification fail to note that the effect of genes is

“never a matter simply of the coming to presence of a single being-as if presence was something that could attach to a single self-sufficient entity. The presenting or disclosedness of a being is always a matter of its coming to presence in relation to other beings” (Malpas, 2008, p. 14).

One factor that Resnik and Vorhaus use to support genetic modification, which they define as “the process of intentionally altering human genes for the purpose of producing offspring with those genetic changes”, is that “most of the causal claims related to genetic determinism are probabilistic, not deterministic” (Resnik, Vorhaus, 2006, p. 2). We support this by contending that *place* breaks any deterministic effects of genes and changes this into probabilistic effects, which are dependent on “an essential mutuality of relation at every level” (Malpas, 2012, p. 4) between genes, the environment and others. This is substantiated by Resnik and Vorhaus who add

“The complex interaction and interdependence of genes and environments, a fundamental and frequently ignored reality of biology, undermines the notion that genotypes alone determine (or cause) phenotypes” (Resnik, Vorhaus, 2006, p. 4).

Conclusion

This article is an essential addition to the literature. Our investigation centred on genetic determinism and *place* and shows something which has not been considered before now. Specifically, our philosophy of *place* shows the potentially dangerous implications of genetic determinism. Fundamentally, genetic determinism promotes mental illness through the formation of obstructive complexes because it leads an individual to be estranged from their authentic *place* to feel at home in the world. Our future research aims to verify this empirically. Our article highlights the media and educational programs play an important role in this formation of complexes. Our article summarises research that shows that the forgetting of *place* that leads to genetic determinism is associated with many forms of discrimination. The film GATTACA was a useful platform to depict a world, which shows the absurdity of genetic determinism, but to highlight also, why our philosophy of *place* is an important resource to remove this ideology from common acceptance. Finally, our work has significant implications for debates on genetic modification. We conclude that many arguments against genetic modification (the freedom, giftedness, authenticity and uniqueness arguments) assume genetic determinism and do not consider *place* in their discussion. Because of this, we support the endeavours of genetic modification because the assumptions and scare tactics used by supporters of genetic determinism that oppose genetic modification are not as *Real* or authentic as they suggest.

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References

- Aivelo, T., & Uitto, A. (2015). Genetic determinism in the Finnish upper secondary school biology textbooks. *Nordic Studies in Science Education*, 11(2), 139-152.
- Beauchamp, M. R., Rhodes, R. E., Kreutzer, C., & Rupert, J. L. (2011). Experiential versus genetic accounts of inactivity: implications for inactive individuals' self-efficacy beliefs and intentions to exercise. *Behavioral Medicine*, 37(1), 8-14.
- Carver, R. B., Castéra, J., Gericke, N., Evangelista, N. A. M., & El-Hani, C. N. (2017). Young adults' belief in genetic determinism, and knowledge and attitudes towards modern genetics and genomics: the PUGGS questionnaire. *PloS one*, 12(1), e0169808.
- Condit, C. M. (2011). When Do People Deploy Genetic Determinism? A Review Pointing to the Need for Multi-factorial Theories of Public Utilization of Scientific Discourses. *Sociology Compass*, 5(7), 618-635.
- Conrad, P. (1997). Public eyes and private genes: Historical frames, news constructions, and social problems. *Soc. Probs.*, 44, 139.
- Dar-Nimrod, I., & Heine, S. J. (2011). Genetic essentialism: on the deceptive determinism of DNA. *Psychological bulletin*, 137(5), 800.
- de Melo-Martín, I. (2005). Firing up the nature/nurture controversy: bioethics and genetic determinism. *Journal of medical ethics*, 31(9), 526-530.
- Dos Santos, V. C., Joaquim, L. M., & El-Hani, C. N. (2012). Hybrid deterministic views about genes in biology textbooks: A key problem in genetics teaching. *Science & Education*, 21(4), 543-578.
- Gericke, N., Carver, R., Castéra, J., Evangelista, N. A. M., Marre, C. C., & El-Hani, C. N. (2017). Exploring Relationships Among Belief in Genetic Determinism, Genetics Knowledge, and Social Factors. *Science & Education*, 1-37.
- Gilbert, S. F. (2002). Genetic determinism: the battle between scientific data and social image in contemporary developmental biology. In *On Human Nature*. Springer, Berlin, Heidelberg.
- Gildersleeve, M. (2016a). Complexes Tickling the Subject. *Humanities*, 5(4), 85.
- Gildersleeve, M. (2016b). Retrieving and Projecting the Transcendent Function with Complexes and the Rosarium Philosophorum. *Cosmos and History: The Journal of Natural and Social Philosophy*, 12(1), 87-106.
- Gildersleeve, M. (2017). Se Faire Voir with Jung and the Ethics of Psychoanalysis. *Social Sciences*, 6(1), 16
- Gildersleeve, M. (2018). Desire and One-sidedness: Extroversion's Enemies Within, Introversion's Enemies Without. *Agathos*, 9(1)
- Gildersleeve, M., & Crowden, A. (2018). Place and Psychoanalysis. *Meta-Research In Hermeneutics Phenomenology And Practical Philosophy*, 10(1), 77-103.

- Harsanyi, Z., Hutton, R. (1981). *Genetic prophecy: beyond the double helix*. Rawson, Wade Publishers.
- Jamieson, A., & Radick, G. (2017). Genetic determinism in the genetics curriculum. *Science & Education*, 26(10), 1261-1290.
- Kampourakis, K. (2017). *Making sense of genes*. Cambridge University Press.
- Kirby, D. A. (2000). The New Eugenics in Cinema: Genetic Determinism and Gene Therapy in "GATTACA". *Science Fiction Studies*, 193-215.
- Kowal, E., & Frederic, G. (2012). Race, genetic determinism and the media: An exploratory study of media coverage of genetics and Indigenous Australians. *Genomics, Society and Policy*, 8(2), 1.
- Malpas, J (1999b) *Place and experience: A philosophical topography*. Cambridge University Press
- Malpas, J. (1999a). Locating Interpretation: The Topography of Understanding in Heidegger and Davidson. *Philosophical Topics*, 27(2), 129-148.
- Malpas, J. (2008). *Heidegger's topology: being, place, world*. MIT press.
- Malpas, J. (2012). *Heidegger and the Thinking of Place*. MIT Press.
- Malpas, J. (2014a). Rethinking dwelling: Heidegger and the question of place. *Environmental and Architectural Phenomenology Newsletter*, 25(1), 15-23.
- Malpas, J. (2014b). Self, other, thing: Triangulation and topography in post-Kantian philosophy. *Philosophy Today*.
- Malpas, J. (2016). Place and hermeneutics: towards a topology of understanding. In G. Warnke (Ed.), *Inheriting Gadamer: new directions in philosophical hermeneutics*. Edinburgh University Press.
- Malpas, J. (Ed.). (2011). *The Place of Landscape: Concepts, Contexts, Studies*. MIT Press
- Midgley, M. (1999). Determinism, omniscience, and the multiplicity of explanations. *Behavioral and Brain Sciences*, 22(5), 900-901.
- Moore, D. S. (2008). Espousing interactions and fielding reactions: Addressing laypeople's beliefs about genetic determinism. *Philosophical Psychology*, 21(3), 331-348.
- Nelkin, D., & Lindee, M. S. (2010). *The DNA mystique: The gene as a cultural icon*. University of Michigan Press.
- Parrott, R., Kahl, M. L., Ndiaye, K., & Traeder, T. (2012). Health communication, genetic determinism, and perceived control: The roles of beliefs about susceptibility and severity versus disease essentialism. *Journal of health communication*, 17(7), 762-778.
- Resnik, D. B., & Vorhaus, D. B. (2006). Genetic modification and genetic determinism. *Philosophy, Ethics, and Humanities in Medicine*, 1(1), 9.
- Rothenberg, K., & Wang, A. (2006). The scarlet gene: behavioral genetics, criminal law, and racial and ethnic stigma. *Law & Contemp. Probs.*, 68, 343.
- Saussure, Ferdinand de (1959). *Course in General Linguistics*. Ed. Charles Bally, Albert Sechehaye, and Albert Riedlinger. Trans. Wade Baskin. New York: McGraw
- Senior, V., Marteau, T. M., & Weinman, J. (2000). Impact of genetic testing on causal models of heart disease and arthritis: an analogue study. *Psychology & Health*, 14(6), 1077-1088.
- Smerecnik, C. M. (2010). Lay responses to health messages about the genetic risk factors for salt sensitivity: Do mass media genetic health messages result in genetic determinism?. *Psychology, health & medicine*, 15(4), 386-393.

Matthew Gildersleeve* – Andrew Crowden**

Genetički determinizam i mjesto

Sažetak

U ovom tekstu smo pregledno opisali fenomen genetičkog determinizma i pojasnili na koji način naše ranije istraživanje posvećeno filozofiji *mjesta* može doprinijeti boljem razumijevanju genomike te pratećih debata u svezi s umjetnom genetičkom preinakom. Pokazali smo kako *mjesto* može potkopati bilo koju filozofiju genetičkog determinizma. Primjenom naše filozofije *mjesta*, ovo istraživanje doprinosi pozivu da se čovječanstvo okrene prema »kolektivnom biti-doma-u-svijetu« umjesto što se otuđuje od *mjesta* što genetički determinizam aktivno promiče. Također, ovdje se koristimo filmologijom kako bismo pokazali da film GATTACA konceptualizira da su *mjesto* i genetički determinizam suprotstavljeni. Naše istraživanje doprinosi aktualnim raspravama fokusiranim na genetički determinizam onako kako se odvijaju u medijima, obrazovanju te onako kako utječu na diskriminaciju. U osnovi, ovdje pokazujemo zašto bi umnici iz ovog područja u svojim budućim istraživanjima trebali razmatrati *mjesto* usporedno s genetičkim determinizmom.

Ključne riječi: genetički determinizam, psihoanaliza, etika, mjesto.

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